Beginning Platino Game Engine

Abhishek Nandy
Debashree Chanda

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Printed on acid-free paper

This book is dedicated to my Mom and Dad. (Abhishek Nandy)

Contents at a Glance

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About the Authors

Abhishek Nandy is the second individual from India to earn the prestigious Intel Black Belt Developer designation. He is also a Microsoft MVP and Intel Software Innovator.

He writes at CodeProject, and he is also a Featured Developer at the Devmesh Intel site (`https://devmesh.intel.com/`). He has proposed two whitepapers for Intel (RealSense with Windows UAP and Windows 10 UWP Integration). He is the founder of Geek Monkey Studios. His startup was among the top 50 at the Digital India Innovate Challenge and Intel's IoT Ultimate Coder Challenge.

He can be contacted at `abhishek.nandy81@gmail.com`. His YouTube Channel can be found at `https://www.youtube.com/channel/UCD1IBC7l6QNpPNMYjubiOtg`.

Debashree Chanda is a designer at Geek Monkey Studios. She is learning Platino and she plans to build lot of apps on it. She has also won several challenges at TopCoder. She writes at C# Corner with the profile `http://www.c-sharpcorner.com/members/debashree-chanda4`. She is also a premium instructor at Udemy.

About the Technical Reviewer

Sumitra Bagchi has a Master's in Computer Application and has worked in Web development and software development for more than six years, working as an individual contributor for the last three years. Her current focus is on Docker, PHP7, IOT, Xamarin, and IBM Bluemix. She has won worldwide challenges through Spiceworks and she also won an award at the worldwide Flir Camera Challenge. She has also worked on Windows 365 development projects. She is a premium instructor with Udemy Online Tutorials.

Acknowledgments

I would like to acknowledge my mom, dad, my brother, and my co-author Debashree Chanda. Thanks go to the entire Intel Software Innovator Team, Intel Black Team, and Microsoft MVP community. Special thanks go to Bob Duffy who showed me the path to contribute to Intel, Ujjwal Kumar, Abhishek Narain, my friend Sourav Lahoti, and one of my fellow innovators Rupam Das, as well as the CEO of Platino, Peach Icaza Pellen, and also to the CEO of Black Gate Games, John Gould.

—Abhishek Nandy

I would like to acknowledge Peach Icaza Pellen, whom I admire a. I admire the way she has become so well known in the game developer community and I would like to follow in her footsteps.

—Debashree Chanda

Forward

About Platino

Platino is the perfect game engine for developers because it was created from the ground up by experts in app development, in engineering, in OpenGL and, critically, by people who had already shown success in creating SDKs for mobile platforms.

Two of the engineers, Carlos Icaza and Peach Icaza Pellen, were previously part of the team behind a popular SDK used, in its prime, by over 100,000 developers. They found that this SDK, although good, was not powerful enough for game developers and while great for beginner, it was far too rigid for more experienced programmers who needed more flexibility.

With those things in mind they teamed up with Kota Iguchi and other industry experts and set about making Platino easy enough for new developers but also so powerful and flexible for experienced programmers; they knew they had succeeded when in the same month a class of high school students adopted Platino for their course work, while elsewhere it was being used to develop a mobile game for Disney which went on to reach the top 10 on several stores.

Utilizing Javascript means that Platino is very easy to pick up for anyone with development experience, regardless of how familiar they are with the mobile technology; but it also grows with the developer, who can work with the engine at a high or low level depending on what is required. If a developer wants to include native code, such as Obj-C or Java, they are able to do so without any limitations.

From a single codebase, developers can then build their applications for iOS and Android, with more platforms to be added in the future.

Beginning Platino Game Engine is a book which gives an insight into Platino Game Engine. Good beginners content.

About Peach Icaza Pellen

Peach is a Platino expert, having been involved with the engine since its inception. Originally Head of Developer Relations at Ansca Mobile, where she worked with Carlos Icaza, creator of Corona SDK, she moved to Lanica when the Platino engine was created in 2012. As Senior Technical Writer, she wrote the majority of the engine's tutorials and documentation, and is well-known as the go-to community for Platino's many developers, from indies to large studios.

When not evangelizing Platino, she contributes resources to websites devoted to helping new developers learn how to create apps on a variety of platforms and works on her apps, along with contributing to applications other developers are building; she had directly worked on over 200 mobile applications and libraries of her creation are used in over 50,000 apps all around the world. As if that weren't enough, she is also a regular contributor to App Developer magazine, continuing to share her knowledge and passion for app-creation, and works closely with Intel as one of their few female investors.

Peach is now continuing her devotion to quality software and app development, directing the Platino Studio team as well as overseeing Platino Inc.'s Professional Software Consulting division.

CHAPTER 1

Introduction to the Game Engine

The game engine has become an essential part of creating a game. The game engine helps developers bring the game to life. The important aspects include audio, video rendering, camera positioning, scene creation, and use of a physics engine in a game.

Every top game company now tries to adapt its own game engine so that they can optimize it for its entire game creation. It is said a good game engine and knowledge are critical to the successful creation of a game.

We Start Here

In this book we cover the basics of game engines, then we introduce the Platino game engine. We go through the steps for installing the engine and then examine the architecture of the engine to see what it is based on. We then start developing apps on the Platino game engine. The focus then moves to creative coding and the different languages and frameworks that support it. We then move on to processing, and we see how Processing JS and also an extension of Processing named P5.js is used to build Windows 10 UWP apps. In the last section, we extend Processing for IoT using Temboo and then we conclude. The journey will be awesome!

In this first chapter we cover the following topics:

- What is a game engine?
- Making a game engine.
- How a game engine works.
- Different game engines.
- Some special HTML 5 physics libraries.

What Is a Game Engine?

Let's start this way: We are playing Prince of Persia and want to figure out how rewind works in the game. We start to see the depth of development of the game. The awesome physics in the game give us an idea of just how difficult it is to complete a game with such detailed effects. There are visuals, graphics rendering, and high-quality audio. After going through the analysis, we find that a game engine is made up of different components, as shown in Figure 1-1. A game engine is a framework for developing games based on some core areas. Let's take a closer look.

Electronic supplementary material The online version of this chapter (doi:10.1007/978-1-4842-2484-7_1) contains supplementary material, which is available to authorized users.

A. Nandy and D. Chanda, *Beginning Platino Game Engine*, DOI 10.1007/978-1-4842-2484-7_1

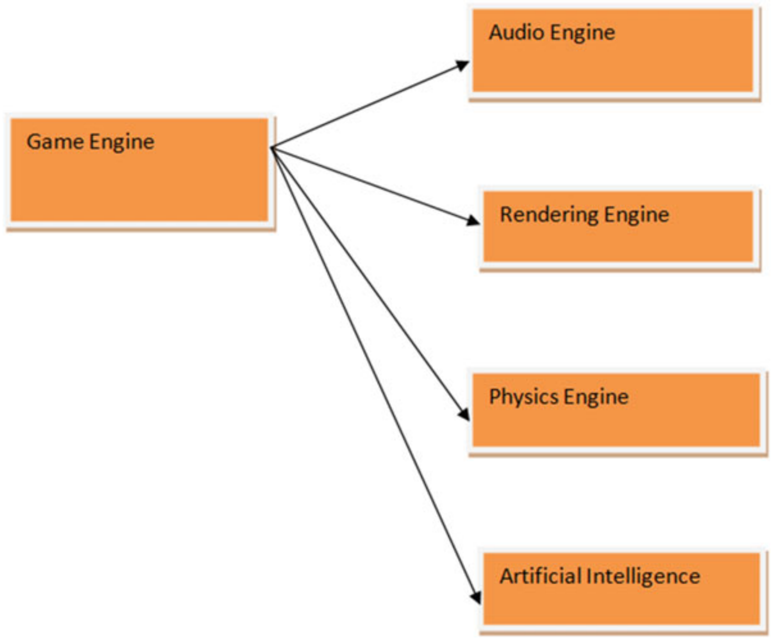


Figure 1-1. *Details of game engine components*

We next break down the terms that are important for understanding game engines.

Audio Engine

The audio engine is very important because sounds play an important role in games. If our playable character is fighting with an enemy, and the fighting mechanism is a sword, when the player makes contact with an enemy's sword we need to produce a sound effect. That work is done by the audio engine. Also, to make the ambience interesting, we add background music and sound effects.

Rendering Engine

The rendering engine helps to determine what is shown as output to users. It is a visual treat for a user when he or she is taken into a game. Rendering helps bring the graphical content of a game to life exactly the way we intended. Generally with the help of software, we get the desired effect.

Let's take a look at the mechanism (Figure 1-2). We don't want to overstress the graphics processing unit (GPU). Because at times the graphics rendered are very high quality, it requires a great deal of processing power and can result in degraded performance. Hence we add a software layer abstraction with the help of appplication programming interfaces (APIs) so that the software base does not have a direct interaction with the GPU. The final result output is shown to the users and they are able to interact accordingly. The WebGL is the new standard for rendering cool graphical user interface (GUI) effects at the browser. We describe each API next, as they hold the graphics part together.

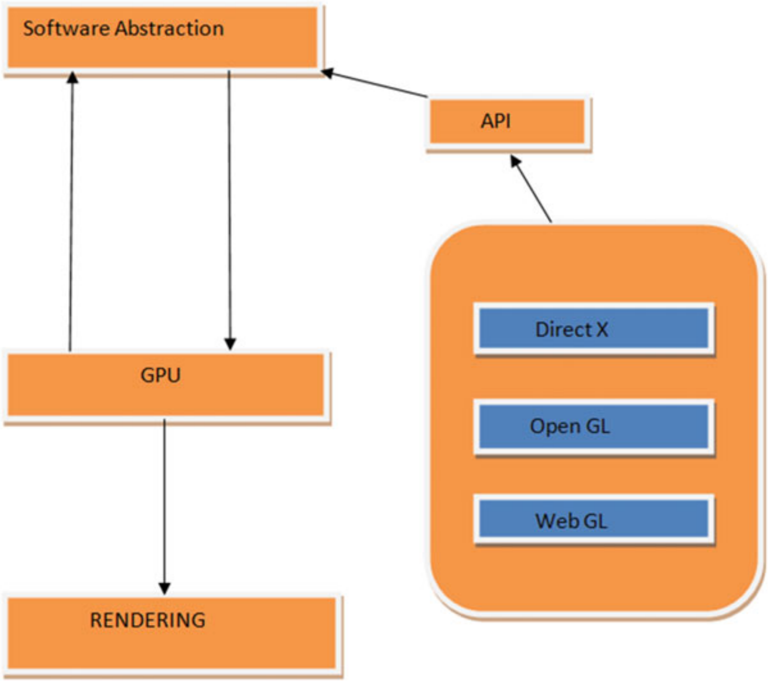


Figure 1-2. *Software abstraction over the GPU*

Direct X

Direct X (Figure 1-3; see `https://support.microsoft.com/en-in/kb/179113`) is a combination of APIs especially for handling rendering the best multimedia from the perspective of game programming on Microsoft platforms. The Microsoft Direct X Software Development Kit (SDK) allows a combination of APIs targeting it for both 32-bit and 64-bit platforms. The SDK is used to create graphic-intensive applications for Windows platforms. Direct X is a combination of APIs such as direct 3D, Direct Draw, and so on. The latest version of Direct X is Direct X 12.

Figure 1-3. *Microsoft Direct X*

Some important versions of Direct X are shown in Figure 1-4.

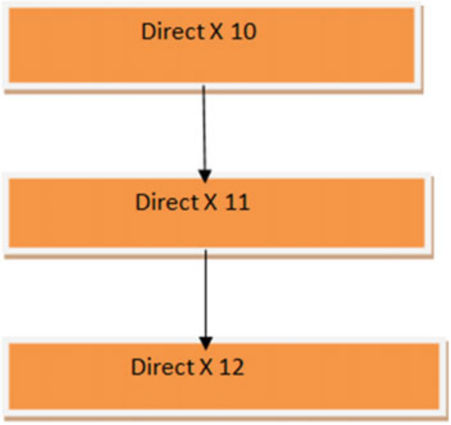


Figure 1-4. *Important versions of Direct X*

- *Direct X 10*: This version was available from Windows Vista. Backward compatibility was also maintained. It featured improved graphics rendering.
- *Direct X 11*: The major update for this version was multithreading for multicore support.
- *Direct X 12*: This version was launched alongside Windows 10. For better resolution of graphics, low-level APIs were introduced.

Open GL

Open GL (Figure 1-5; see `https://www.opengl.org/`) is a cross-platform API that helps in rendering 2D and 3D vector graphics. The most important current introduction to the Open GL standard is Vulkan. Vulkan (Figure 1-6; see `https://www.khronos.org/vulkan/`) is a next-generation OpenGL initiative. The API targets high performance with lower optimization and less pressure on the GPU or CPU for processing the rendered output.

Figure 1-5. *Open GL*

Figure 1-6. *Vulkan API for graphics*

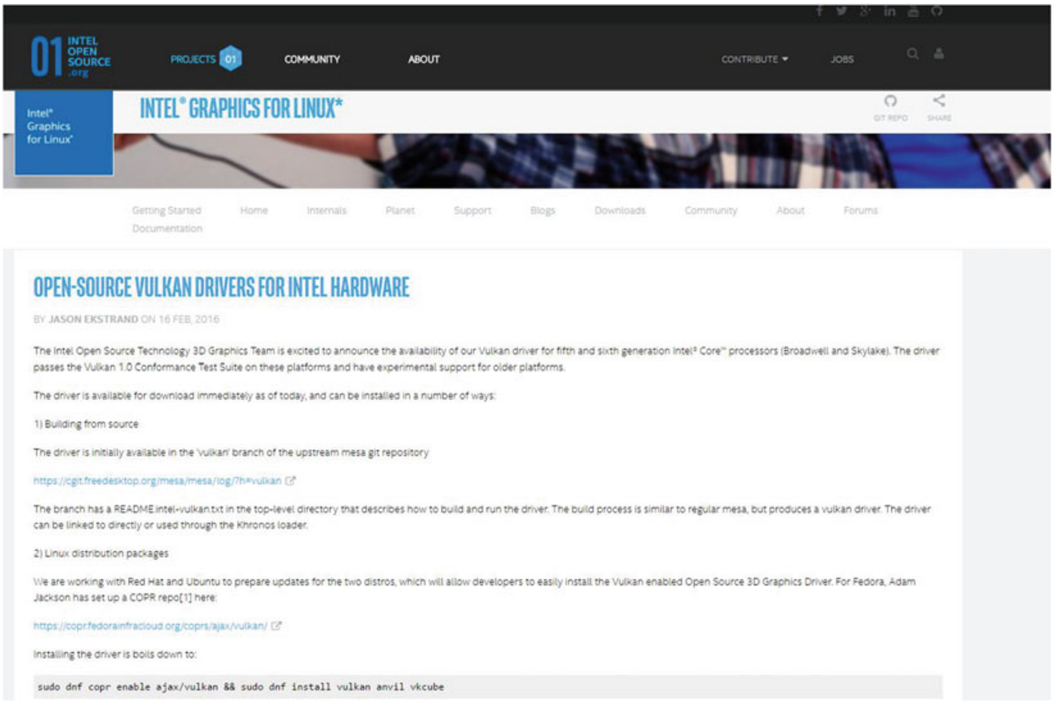
The following are the main advantages of the Vulkan API:

- It is not restricted to a specific operating system (OS), so it can be scaled up and scaled down accordingly, including support meant for mobile OS, too, such as Tizen, Linux (Ubuntu Mobile), and so on.
- Better multicore utility.
- Low CPU overhead.

As soon as the Vulkan API was released, Intel was ready with graphics drivers for Vulkan, and over time the industry has moved toward Vulkan.

At GDC 2016, Intel shared their benchmark for Vulkan API at their booth on devices ranging from tablets to PCs, and so on. The demo showcased DOTA 2 running on Valve's source engine (see Figure 1-7), and had already started porting it using the Linux open source driver (Figure 1-8; see `https://01.org/linuxgraphics/blogs/jekstrand/2016/open-source-vulkan-drivers-intel-hardware`).

Figure 1-7. *Vulkan API running DOTA 2 using Valve's source engine*



OPEN-SOURCE VULKAN DRIVERS FOR INTEL HARDWARE

BY JASON EKSTRAND ON 16 FEB, 2016

The Intel Open Source Technology 3D Graphics Team is excited to announce the availability of our Vulkan driver for fifth and sixth generation Intel® Core™ processors (Broadwell and Skylake). The driver passes the Vulkan 1.0 Conformance Test Suite on these platforms and have experimental support for older platforms.

The driver is available for download immediately as of today, and can be installed in a number of ways:

1) Building from source

The driver is initially available in the 'vulkan' branch of the upstream mesa git repository

https://cgit.freedesktop.org/mesa/mesa/log/?h=vulkan

The branch has a README.intel-vulkan.txt in the top-level directory that describes how to build and run the driver. The build process is similar to regular mesa, but produces a vulkan driver. The driver can be linked to directly or used through the Khronos loader.

2) Linux distribution packages

We are working with Red Hat and Ubuntu to prepare updates for the two distros, which will allow developers to easily install the Vulkan enabled Open Source 3D Graphics Driver. For Fedora, Adam Jackson has set up a COPR repo[1] here:

https://copr.fedorainfracloud.org/coprs/ajax/vulkan/

Installing the driver is boils down to:

```
sudo dnf copr enable ajax/vulkan && sudo dnf install vulkan anvil vkcube
```

Figure 1-8. *The Intel Graphics for Linux web page where we obtain the open source Vulcan drivers*

Another internal demo was shown running on Windows. That demo showcased some of the cool features of the Vulkan API, and the frame rate obtained was around 40 frames per second (fps). The Android demo showcased the same features with nearly 30 fps.

WebGL

WebGL (Figure 1-9) is specially designed for rendering 3D graphics processing at the web browser level. It is entirely based on JavaScript. Some important WebGL libraries are Threes, D3.js, and so on.

Figure 1-9. *WebGL logo*

Physics Engine

Thinking of physics conjures up thoughts of Newton's laws of motion. These laws balance the world's activity pertaining to gravity in everyday scenarios. If we need to replicate the same condition and logic in terms of games, therefore, we have to use physics engine.

Some important physics-related aspects of game engines are the following:

- Collision detection.
- Soft body dynamics.
- Brownian motion, and so on.

One of the most important game engines is Havok's game engine, so let's take a look.

Havok Engine

The Havok engine (Figure 1-10; see `http://www.havok.com/`) is a suite of software using Havok's technology specifically targeting games. It produces life-like effects in games. Its collision detection, dynamics of rigid bodies, and physics simulation are unique and very accurate. The features of the engine are shown in Figure 1-11.

Figure 1-10. *Havok engine logo*

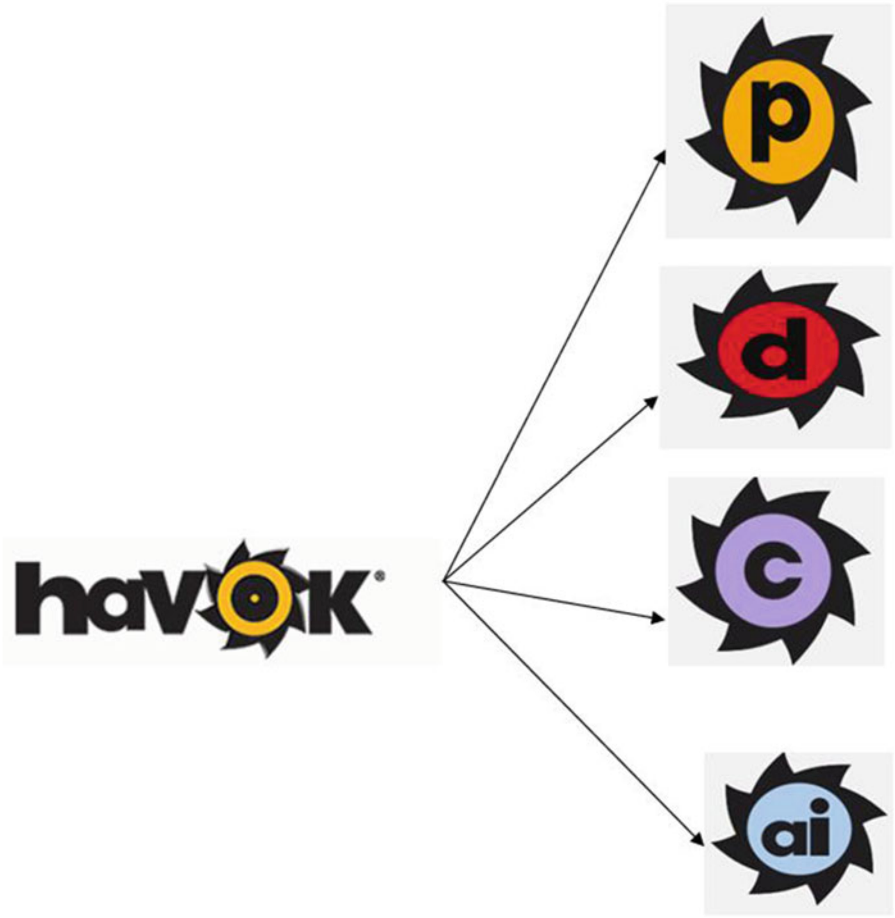


Figure 1-11. *Different Havok options available*

The different Havok engine options are as follows:

- Havok physics (P).
- Havok destruction (D).
- Havok cloth (C).
- Havok artificial intelligence (AI).

Artificial Intelligence in Games

AI plays a pivotal role in games. This logic provides building blocks for key player engagements in the game. The logic between our player character and the surroundings can be highly engaging if we implement a good AI logic.

AI is nothing but a set of algorithms implemented to get our logics implemented in a game. The A* algorithm (Figure 1-12) is one of the most popular algorithms implemented in games to help us with path finding and graph traversals.

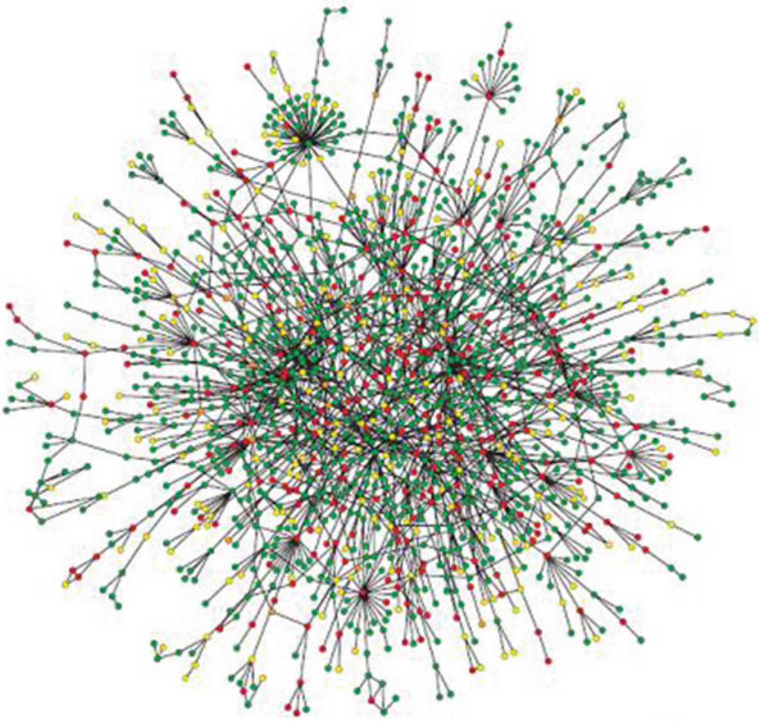


Figure 1-12. *A* algorithm depiction*

Generally in different game engines, A* algorithms helps in character tracking to a point. In the Unity game engine (which we describe briefly later on), it helps with nemeses and also proper guidance of a character to a destination.

Blend Trees in the Unity Game Engine

Blend trees in games are similar to a state automata where the machine goes through specified steps. In the Unity engine, it is the state of animations that reflect the same (see Figure 1-13).

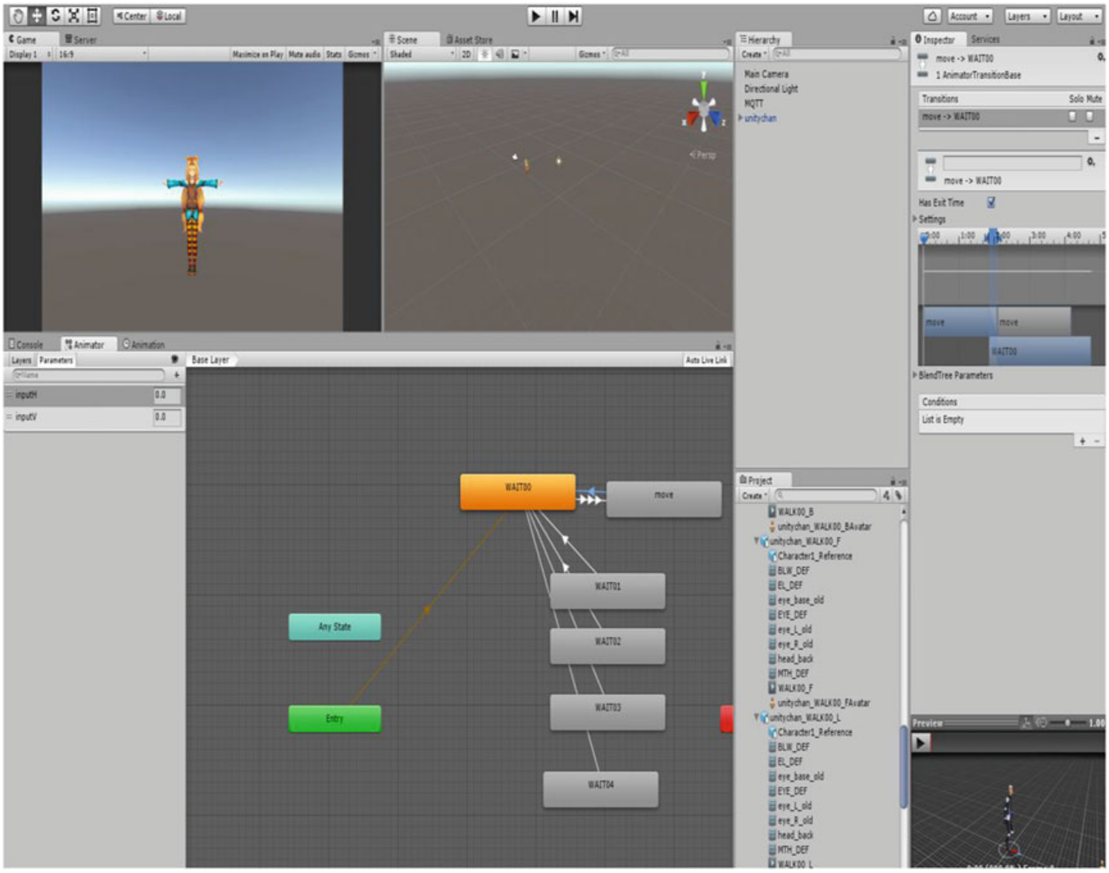


Figure 1-13. *Blend state in Unity*

Making a Game Engine

Creating a game engine of our own is a very tedious job. It requires a lot of hard work, time, energy, and brain power to get the perfect logic within which your game will work. It usually requires an input and the output. The input is the game and the output is the result, or how the game works. Creating a game engine involves several implementations of the logic defined previously with the included framework for our game environment.

Figure 1-14 shows how the development of game engine logic works.

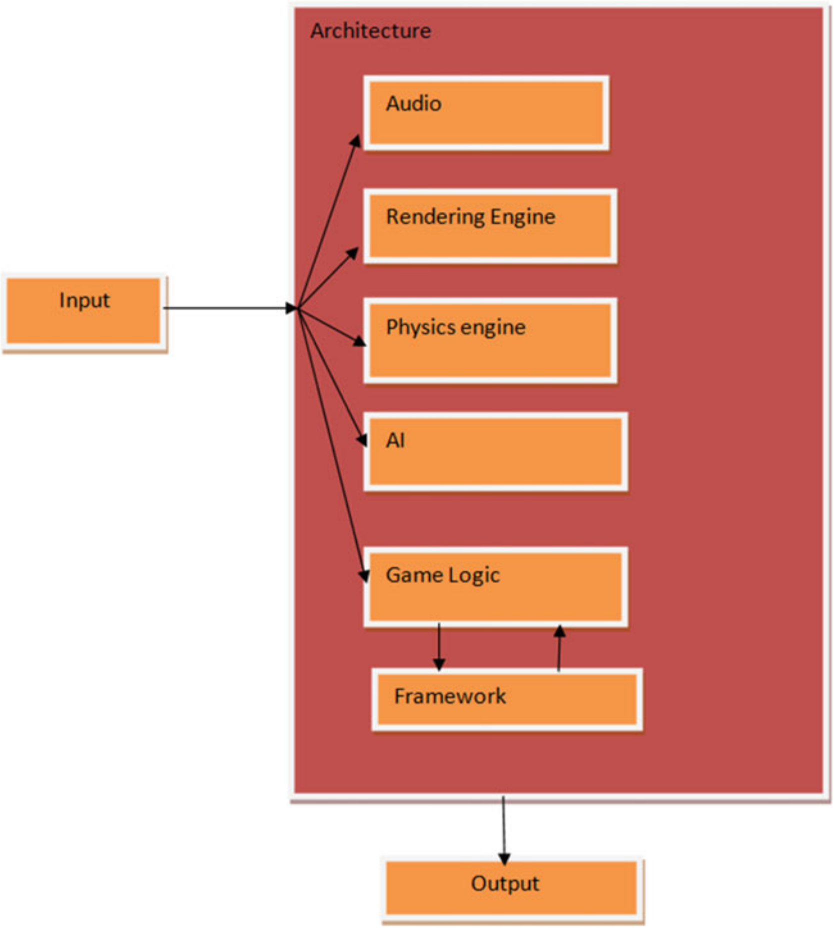


Figure 1-14. *Game engine development logic*

Different Game Engines

In this section we discuss the game engines that are available on the market and are useful for making games. These game engines will give you an idea about what is the best game engine available.

Unity Game Engine

Unity (Figure 1-15l see `https://unity3d.com/`) is one of the most versatile game engines being used in this industry today. It supports 21 platforms. Figure 1-16 shows the flow of Unity for some common platforms.

Figure 1-15. *Unity logo*

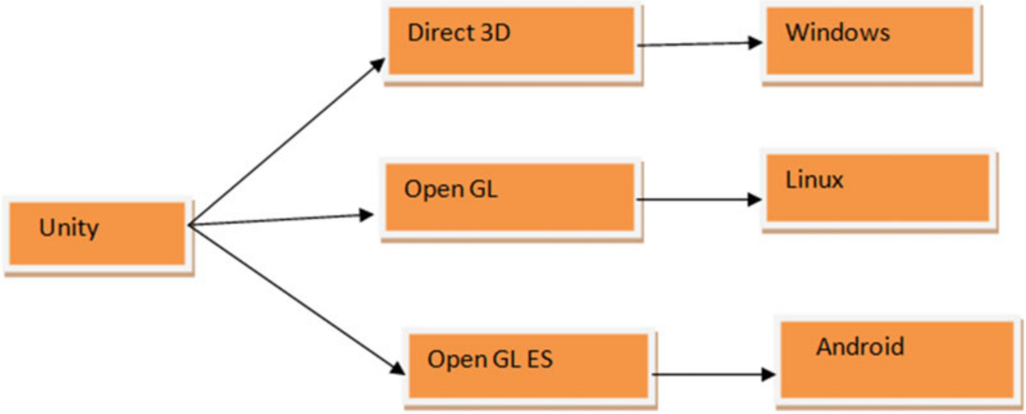


Figure 1-16. *Unity and its acceptance across platforms*

As per Figure 1-16, Unity uses Direct 3D for Windows-based application, Open GL for Linux platforms, and Open GL ES for Android applications.

Unity is full of features. The following are some of the most important ones.

- Life-like animation.
- Scripting with C#, JavaScript, or Boo.
- Unmatched import pipeline.
- Fully extensible editor.
- State machines.
- Blend trees.

- Inverse kinematics.
- Physics-based shading.
- Shuriken-based particle system.
- 2D physics.
- Sprite packer.
- Automatic sprite animation.
- Multithreaded simulation.
- Advanced vehicle physics.

Unreal 4 Game Engine

Unreal 4 (Figure 1-17; see `https://www.unrealengine.com/what-is-unreal-engine-4`) is a game engine developed by Epic Games. The most important part of the engine is that its scripting option is C++, which is very fast for compilations. The Unreal Development Kit and Unreal script have evolved as Blueprints in Unreal 4. Access for Unreal 4 across major platforms is shown in Figure 1-18.

Figure 1-17. *Unreal4 logo*

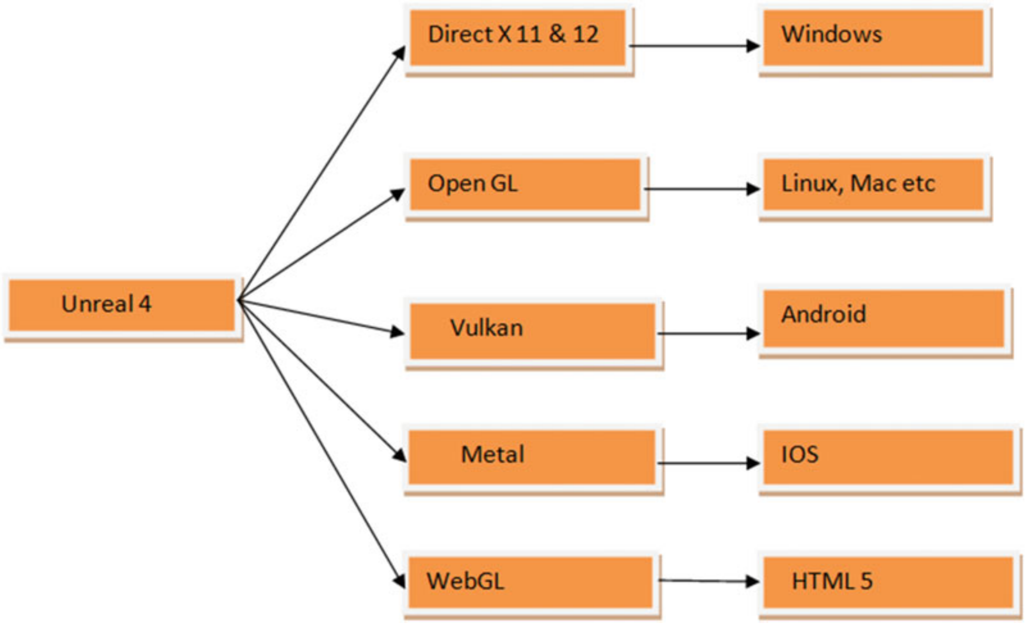


Figure 1-18. *Platform accessibility for Unreal 4*

Blueprints

Blueprints are the newly introduced visual scripting tool in Unreal 4. It is completely a node-to-node-based logic that adds the game logic to the game you are building. It supports the object-oriented paradigm. The scripting mechanism can be interlinked with C++-based programming techniques. Figure 1-19 is an example of how Blueprints look.

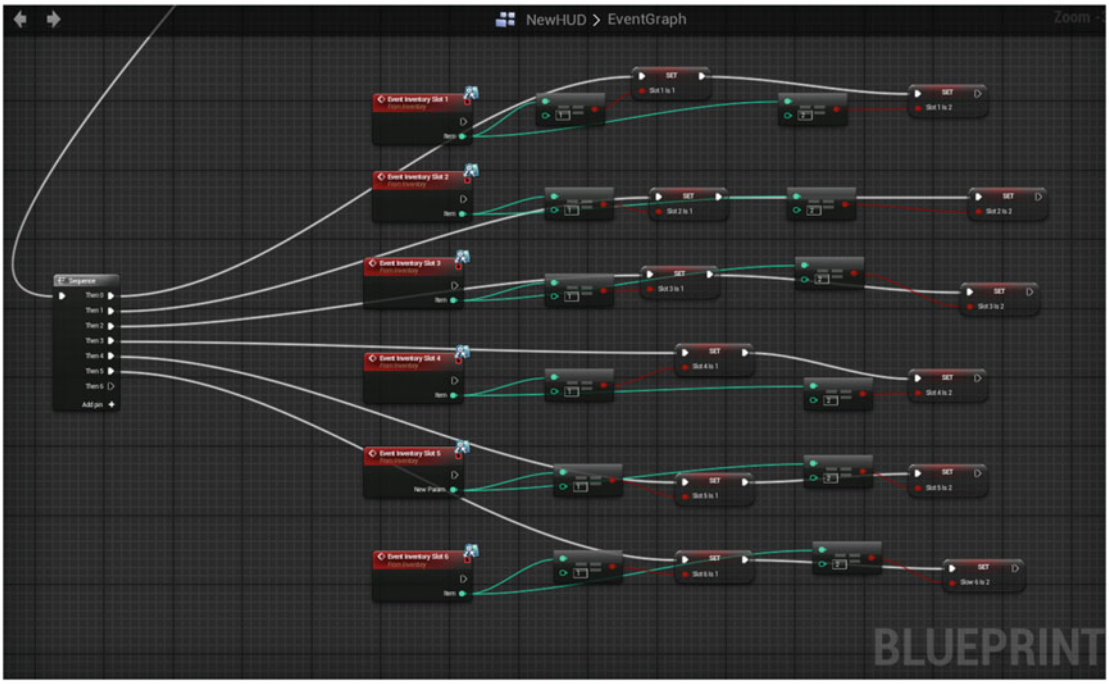


__Figure 1-19.__ Blueprints in Unreal 4 engine.

Features of Unreal 4 Engine

The following are some important features of Unreal 4 engine.

- Supports advanced Direct X 11 and Direct X 12 features.
- Cascade visual effects.
- New material pipeline.
- Blueprint visual scripting.
- Live Blueprint debugging.
- Content browser.
- Persona animation.
- Matinee cinematics.
- Terrain and foliage.
- Postprocess effects.
- Simulate and immersive views.
- Instant game preview.
- Artificial intelligence.
- Audio.
- Learning middleware integration.

Some Special HTML5 and JavaScript Libraries

Box2D

Box2D is a physics engine that helps in simulating rigid body physics in 2D. Box2D generates continuous collision detection between objects. It is fast and easy to implement. An example is shown in Figure 1-20.

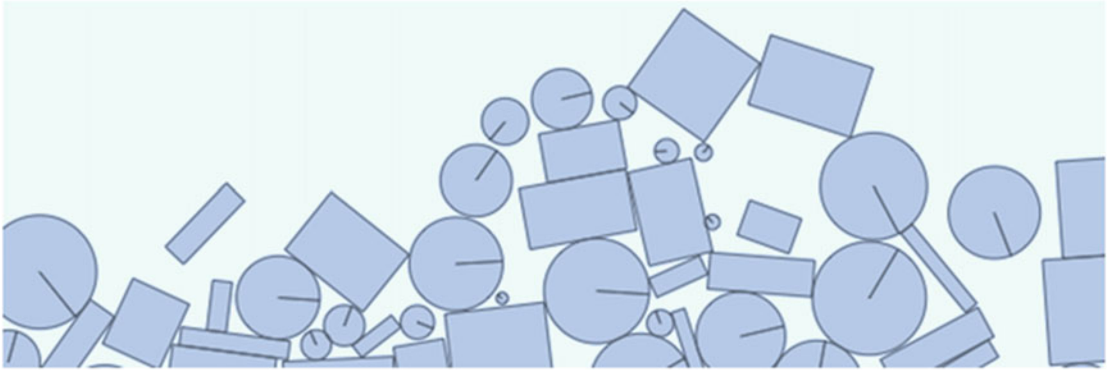
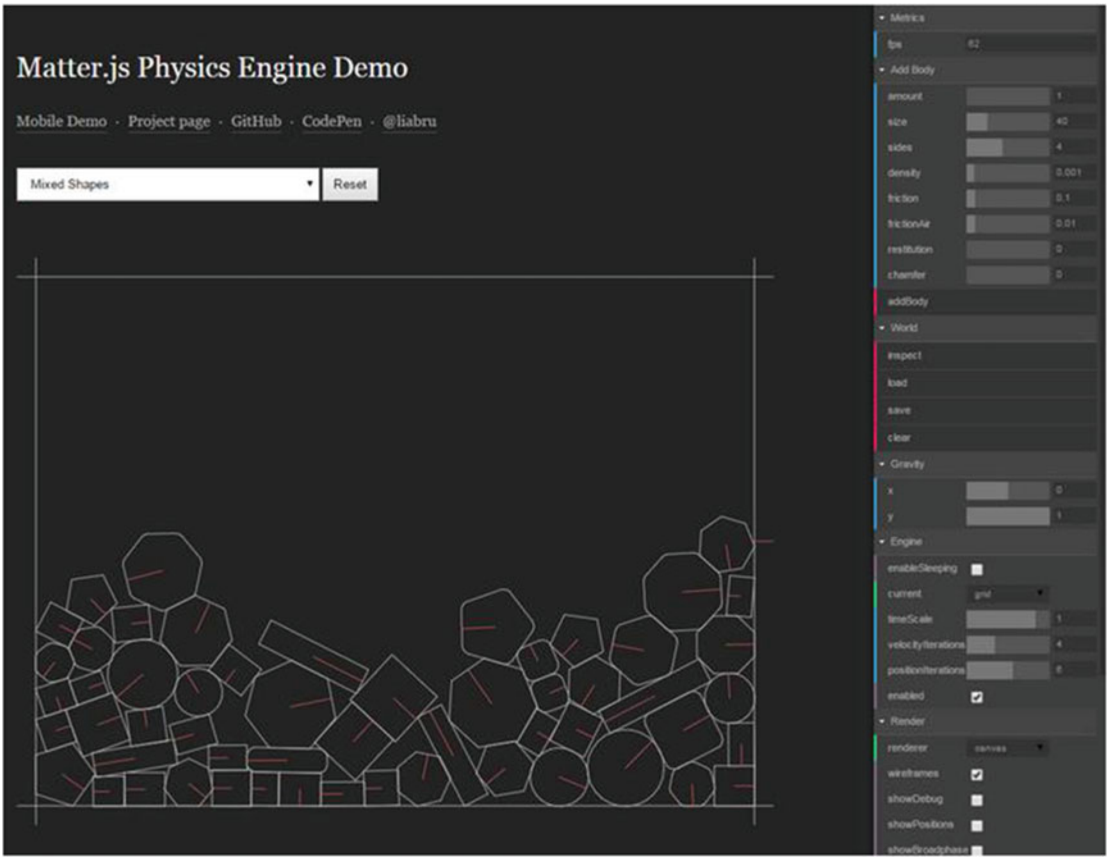


Figure 1-20. *Box2D example*

MatterJS

MatterJS (Figure 1-21; see `http://box2d.org/`) is essentially a 2D physics engine for the Web.



Matter.js Physics Engine Demo

Mobile Demo · Project page · GitHub · CodePen · @liabru

Metrics
fps 62

Add Body
amount 1
size 40
sides 4
density 0.001
friction 0.1
frictionAir 0.01
restitution 0
chamfer 0

World

Gravity
x 0
y 1

Engine
enableSleeping □
current grid
timeScale 1
velocityIterations 4
positionIterations 6
enabled ☑

Render
renderer canvas
wireframes ☑
showDebug □
showPositions □
showBroadphase □

Figure 1-21. *MatterJS example*

Some important features of MatterJS are rigid body simulation, component body simulation, and much more. It helps in bringing the physics simulation into a browser-based environment.

Summary

In this chapter we have covered what game engines are, the components of a game engine, major game engines, and the physics related to game engines. This chapter gives you a basic idea of how a game engine works. We continue on to explore the future of game engines and their continuously evolving nature.

CHAPTER 2

The Platino Game Engine

In this chapter, we go through what exactly the Platino game engine does and how it has evolved. We also take a look at the people behind the game engine.

Platino Game Engine

Platino is a cross-platform game engine.The main purpose for creating the game engine was to use JavaScript to build native mobile games and apps.

The Platino Internet home page is shown in Figure 2-1.

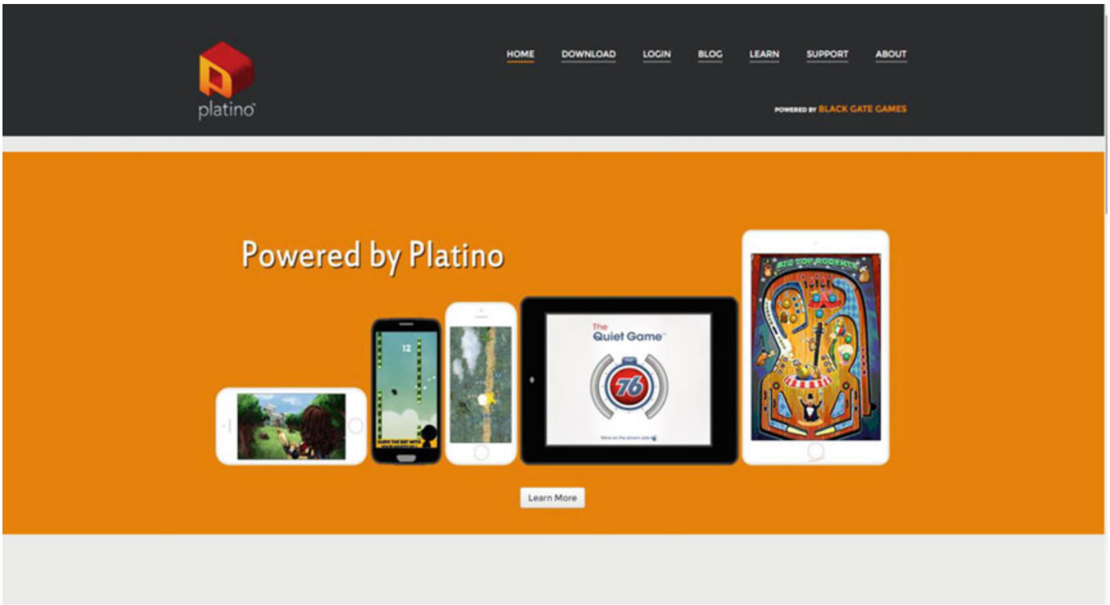
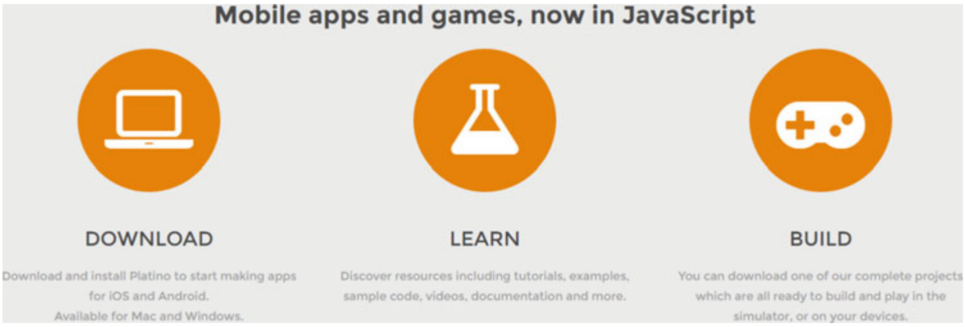


Figure 2-1. *The Platino home page*

A. Nandy and D. Chanda, *Beginning Platino Game Engine*, DOI 10.1007/978-1-4842-2484-7_2

The content in the web site is divided into three parts, shown in Figure 2-2: Download, Learn, and Build.



Mobile apps and games, now in JavaScript

DOWNLOAD

Download and install Platino to start making apps for iOS and Android.
Available for Mac and Windows.

LEARN

Discover resources including tutorials, examples, sample code, videos, documentation and more.

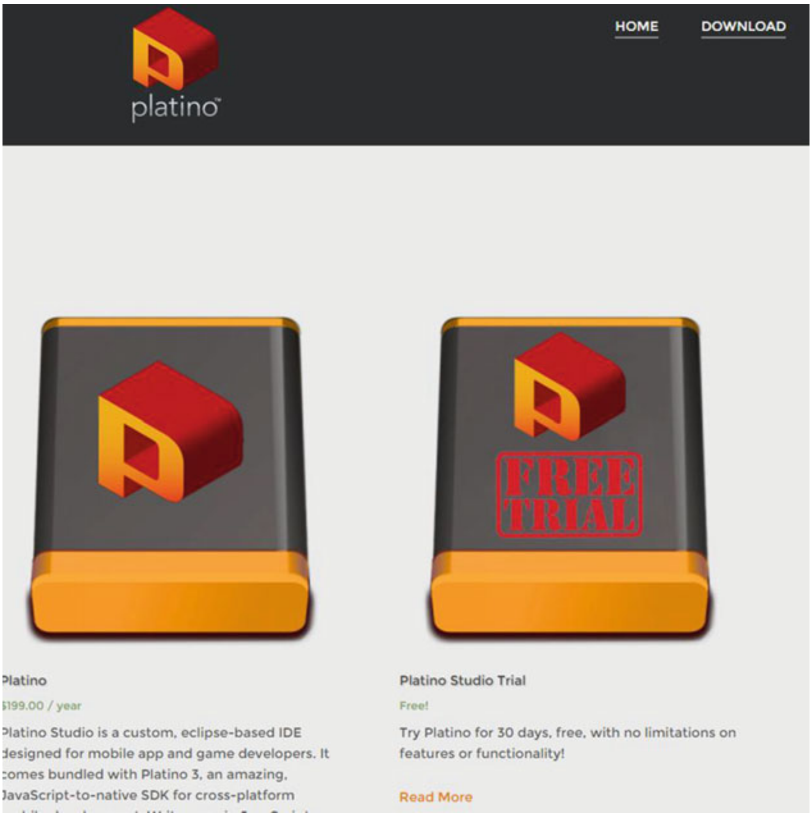
BUILD

You can download one of our complete projects which are all ready to build and play in the simulator, or on your devices.

Figure 2-2. *The Platino page web site categories*

Download

As the name suggests, clicking the Download icon takes you to another page where you can try Platino for a 30-day trial or purchase a yearly license for $199 (see Figure 2-3).



Platino

$199.00 / year

Platino Studio is a custom, eclipse-based IDE designed for mobile app and game developers. It comes bundled with Platino 3, an amazing, JavaScript-to-native SDK for cross-platform

Platino Studio Trial

Free!

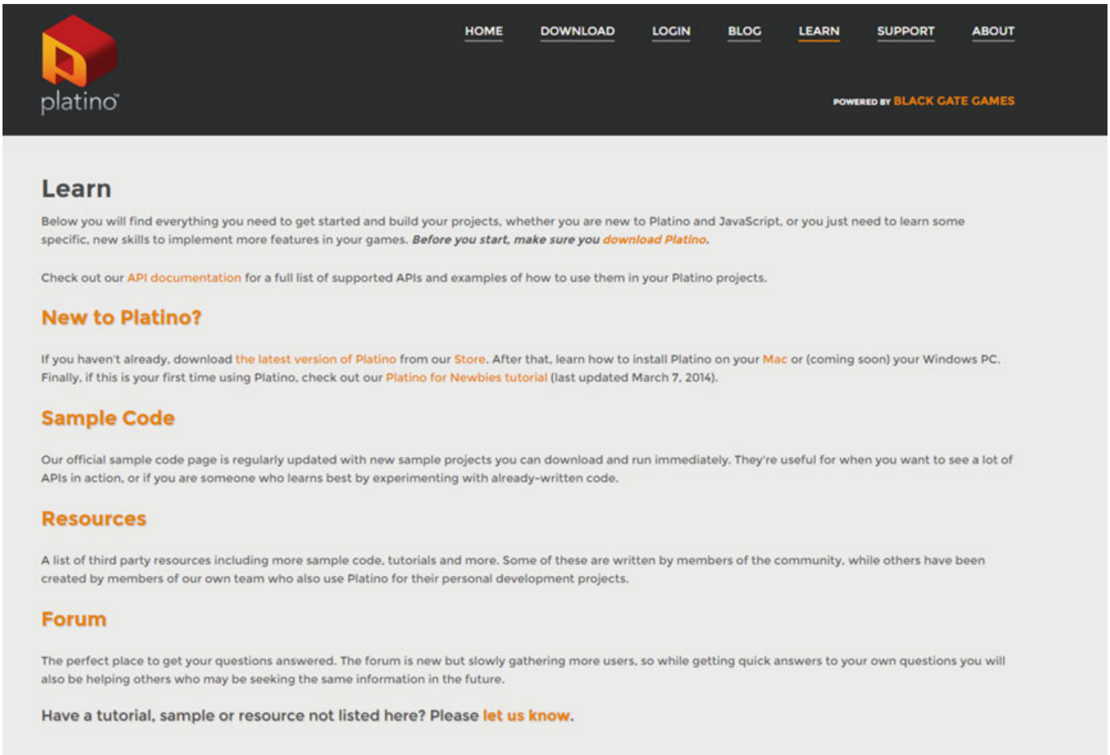
Try Platino for 30 days, free, with no limitations on features or functionality!

Read More

Figure 2-3. *The Download page*

Learn

The Learn section provides a lot of options (see Figure 2-4), including resources and code samples to get a grip on Platino.



Learn

Below you will find everything you need to get started and build your projects, whether you are new to Platino and JavaScript, or you just need to learn some specific, new skills to implement more features in your games. *Before you start, make sure you download Platino.*

Check out our API documentation for a full list of supported APIs and examples of how to use them in your Platino projects.

New to Platino?

If you haven't already, download the latest version of Platino from our Store. After that, learn how to install Platino on your Mac or (coming soon) your Windows PC. Finally, if this is your first time using Platino, check out our Platino for Newbies tutorial (last updated March 7, 2014).

Sample Code

Our official sample code page is regularly updated with new sample projects you can download and run immediately. They're useful for when you want to see a lot of APIs in action, or if you are someone who learns best by experimenting with already-written code.

Resources

A list of third party resources including more sample code, tutorials and more. Some of these are written by members of the community, while others have been created by members of our own team who also use Platino for their personal development projects.

Forum

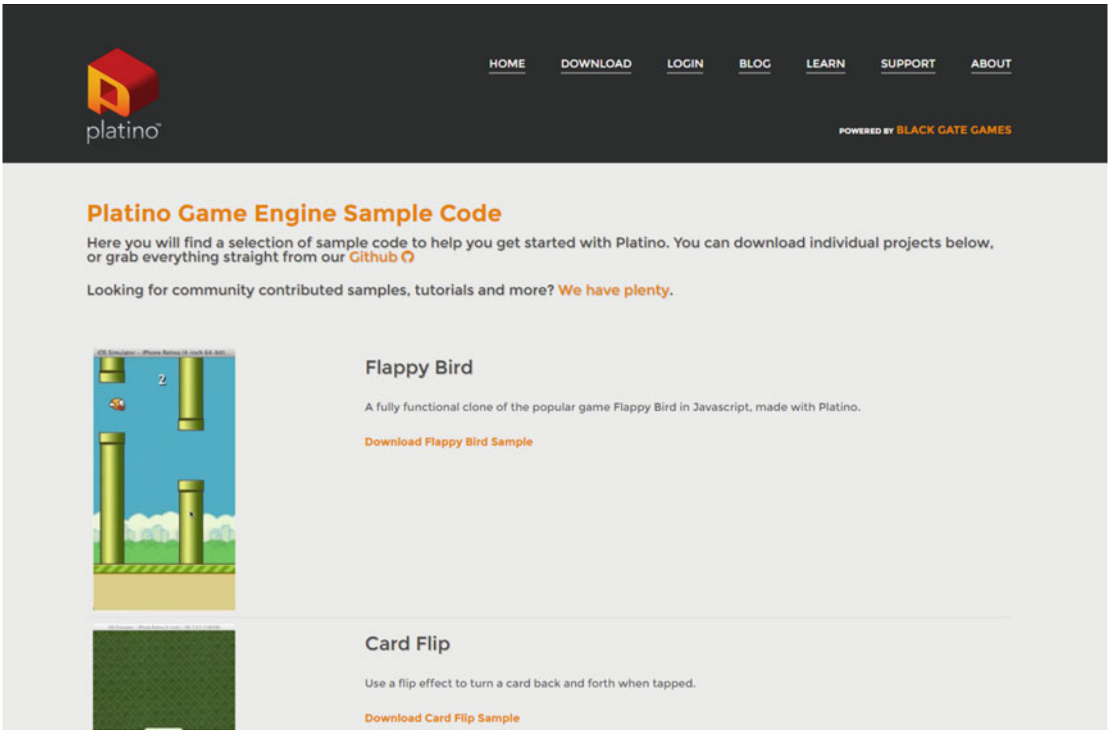
The perfect place to get your questions answered. The forum is new but slowly gathering more users, so while getting quick answers to your own questions you will also be helping others who may be seeking the same information in the future.

Have a tutorial, sample or resource not listed here? Please let us know.

Figure 2-4. *The Learn page*

Build

In the Build section (Figure 2-5), there are plenty of samples that you can and adapt and modify to your liking.



Platino Game Engine Sample Code

Here you will find a selection of sample code to help you get started with Platino. You can download individual projects below, or grab everything straight from our Github

Looking for community contributed samples, tutorials and more? We have plenty.

Flappy Bird

A fully functional clone of the popular game Flappy Bird in Javascript, made with Platino.

Download Flappy Bird Sample

Card Flip

Use a flip effect to turn a card back and forth when tapped.

Download Card Flip Sample

Figure 2-5. *The Build page*

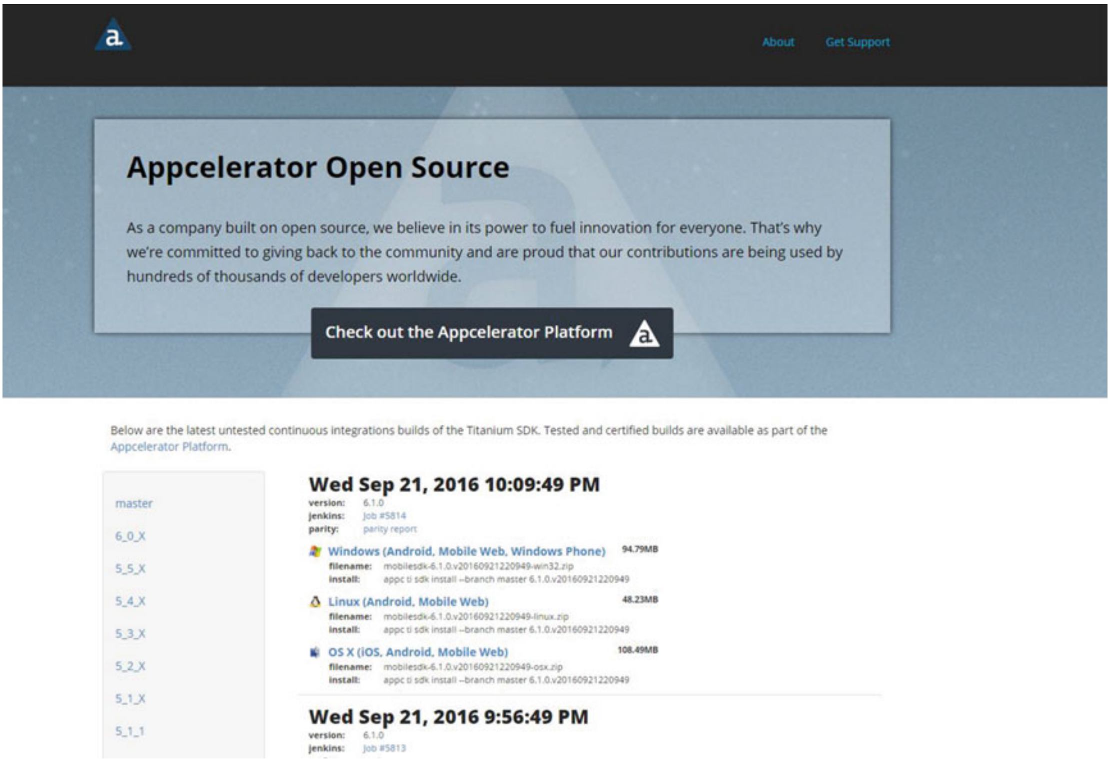
Platino and Titanium SDK

The Platino game engine has been developed hand in hand with Titanium. The features of the Titanium SDK added to the capabilities of the Platino game engine result in a powerful combination to work with. Coding in Platino is done entirely using JavaScript and the result is a very robust application.

Figure 2-6. *Titanium SDK logo*

Titanium SDK

The Titanium SDK (Figure 2-6; see `http://builds.appcelerator.com/#master`) allows usage of native capability through JavaScript for iOS and Android. Titanium uses hardware-specific features such as the Android menu button. We can use OS-specific controls for iOS such as COCOA UI controls. It uses a platform-oriented notification mechanism (Figure 2-7).



Appcelerator Open Source

As a company built on open source, we believe in its power to fuel innovation for everyone. That's why we're committed to giving back to the community and are proud that our contributions are being used by hundreds of thousands of developers worldwide.

Below are the latest untested continuous integrations builds of the Titanium SDK. Tested and certified builds are available as part of the Appcelerator Platform.

Wed Sep 21, 2016 10:09:49 PM

version: 6.1.0
jenkins: Job #5814
parity: parity report

Windows (Android, Mobile Web, Windows Phone) 94.79MB
filename: mobilesdk-6.1.0.v20160921220949-win32.zip
install: appc ti sdk install --branch master 6.1.0.v20160921220949

Linux (Android, Mobile Web) 48.23MB
filename: mobilesdk-6.1.0.v20160921220949-linux.zip
install: appc ti sdk install --branch master 6.1.0.v20160921220949

OS X (iOS, Android, Mobile Web) 108.49MB
filename: mobilesdk-6.1.0.v20160921220949-osx.zip
install: appc ti sdk install --branch master 6.1.0.v20160921220949

Wed Sep 21, 2016 9:56:49 PM

version: 6.1.0
jenkins: Job #5813

Figure 2-7. *The Titanium SDK platform*

Alloy Framework

The Alloy framework (Figure 2-8) is based on a Model View Controller architecture and has built-in support for Backbone.js as well as Underscore.js. These three combinations works perfectly with each other, so a build consisting of Titanium and Platino, and implemented over an Alloy framework template, shapes up the app very well, and it is easy to use and robust, too.

Figure 2-8. *The Alloy framework*

When we use a template from Platino Studio that involves the Titanium SDK Platino game engine capability, we can build very good looking apps. The flow is shown in Figure 2-9.

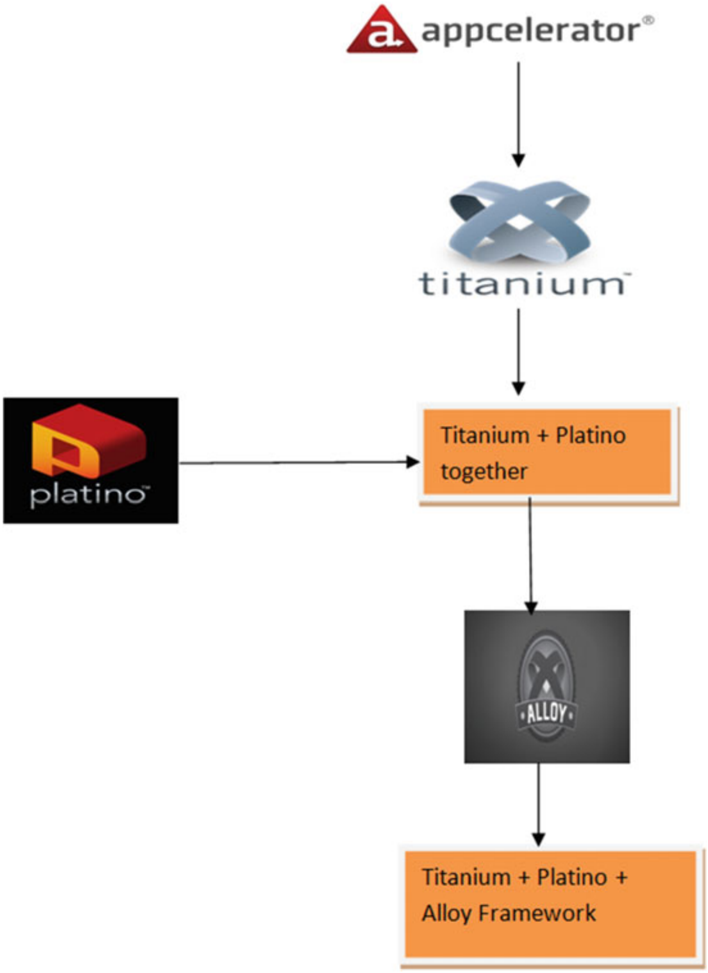
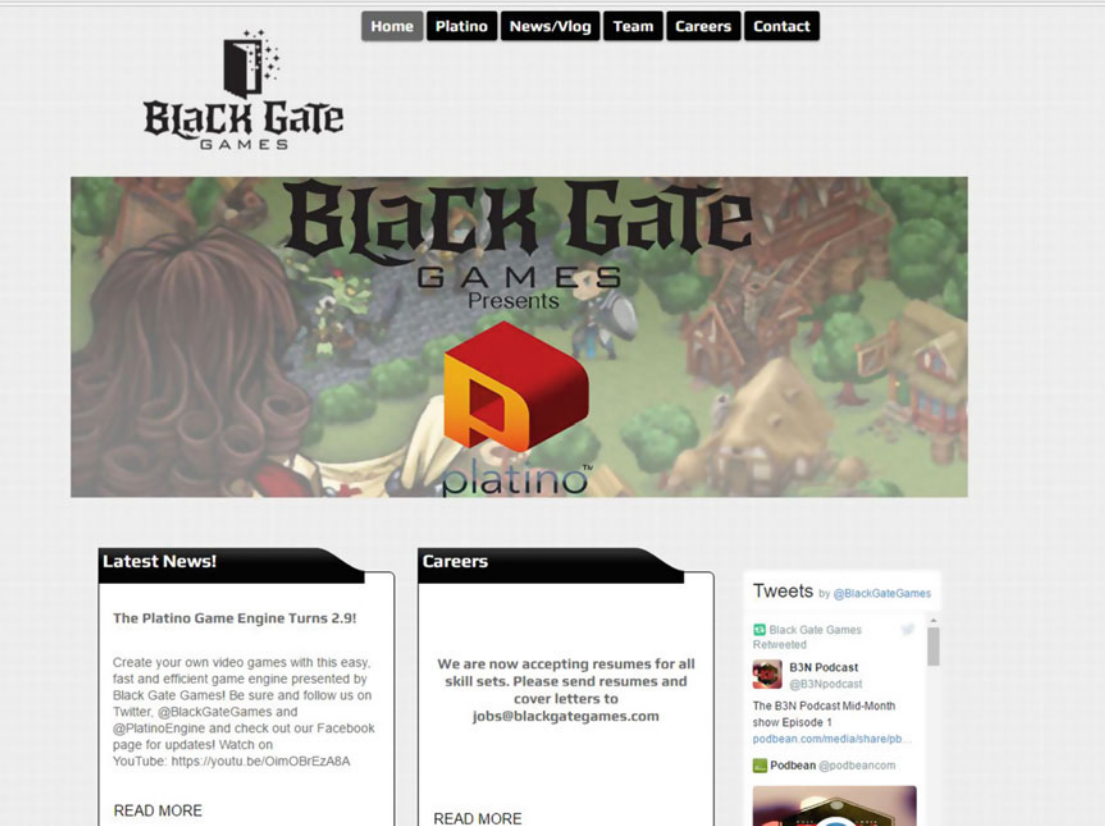

appcelerator®
titanium™
platino™
Titanium + Platino together
ALLOY
Titanium + Platino + Alloy Framework

Figure 2-9. *The flow of a combined template*

How the Engine Has Evolved

The latest version of Platino game engine, release 3.0.0, has come a long way. It was originally Lanico's Platino engine and was available from the Web directly from Lanico's web site. With the recent acquisition of the Platino game engine by Black Gate Games, the entire Platino engine has been revamped and the newly available Platino engine is available from at `https://platino.io/`.

Currently the Platino game engine is powered by Black Gate Games (`http://www.blackgategames.com/`). The web site appears as shown in Figure 2-10.



Latest News!

The Platino Game Engine Turns 2.9!

Create your own video games with this easy, fast and efficient game engine presented by Black Gate Games! Be sure and follow us on Twitter, @BlackGateGames and @PlatinoEngine and check out our Facebook page for updates! Watch on YouTube: https://youtu.be/OimOBrEzA8A

Careers

We are now accepting resumes for all skill sets. Please send resumes and cover letters to jobs@blackgategames.com

Black Gate Games Retweeted

B3N Podcast @B3Npodcast

The B3N Podcast Mid-Month show Episode 1 podbean.com/media/share/pb...

Podbean @podbeancom

Figure 2-10. *Black Gate Games web site*

Core Features of Platino Game Engine

Let's take a look at the core features of the Platino game engine.

- Because Platino uses the widely accepted Titanium SDK, we can create native games and apps using JavaScript.
- Being cross-platform, we can target different OS.
- Platino engine supports Open GL.

- It has complete Sprite Sheet support.
- It uses an isometric tile engine, producing the best effect for achieving the optimum performance of the GPU.
- Platino uses a Physics JS module to produce very realistic physics effects in games.

People Behind the Game Engine

Let's take a detailed look at people who are behind the Platino game engine.

John Gould

John Gould is the CEO of Black Gate Games, the company that now powers the Platino game engine. Gould founded Avatar Software in 2003 with the aim of becoming the premier boutique software development firm in the Nashville area. He has more than 15 years of experience developing software and managing successful projects for companies from 5 employees up to 50,000. Gould started developing mobile applications in 2010. As he saw the increasing need for outstanding mobile app developers, he cofounded Codex Labs to offer mobile development training for Appcelerator's Titanium Studio. He is immensely talented and holds the entire Black Gate Games team together.

Peach Icaza Pellen

Peach Icaza Pellen an Intel Software Innovator and CEO of Platino Game Studio. She is immensely talented and is skilled at teaching and sharing with the development community. She helps fellow developers to master concepts, participates regularly at meetups, and speaks about Platino game engine and helps others adapt to the new features of the game engine. She is a Platino expert, having been involved with the engine since its inception. Originally Head of Developer Relations at Ansca Mobile, creator of the Corona SDK, she moved to Lanica when the Platino engine was created in 2012. As a senior technical writer, she wrote the majority of the engine's tutorials and documentation, and is well-known as the go-to community contact for Platino's many licensees.

When not evangelizing Platino, Pellen found time to create Techority, a web site devoted to helping new developers learn how to create apps on a variety of platforms. If that weren't enough, she is also a regular contributor to *App Developer* magazine, continuing to share her knowledge and passion for app creation.

She is now continuing her devotion to quality software and app development, directing the Platino Studio team as well as overseeing Platino, Inc.'s Professional Software Consulting division.

Joseph Austin

Joseph Austin is a lead developer for the Platino game engine and adds stability and impetus to the game engine.

Carlos Manuel Icaza (1966–2016)

Although he is no longer with us, Carlos Manuel Icaza's willingness to help the community of developers has been always rich. He was immensely talented as an individual and he had the ability to inspire others.

He had 20 years of engineering and management experience, including managing various teams at Adobe such as the Flash Lite team, Flash Mobile Authoring, Flash Cast, and Adobe Illustrator. He was also responsible for creating and developing Adobe's entire mobile authoring strategy, now deployed across the entire Adobe Creative Suite.

Aside from managing experience, Icaza shipped leading and award-winning, industry-standard applications such as Flash Lite (deployed in over 2 billion devices), Flash Authoring, Adobe Creative Suite, Adobe Mobile Device Central, Adobe Illustrator, SVG, Adobe Pagemill, Micrografx Windows Draw, and Deneba Canvas.

In 2007 he founded and was the CEO of Ansca, Inc, which makes the Corona SDK and successfully closed a $1.5 million series a round. In 2014, he cofounded RCTSports, a wearable sensor company, providing tracking and analytics for college and professional teams and athletes to provide insights into their performance.

He successfully attended numerous meetups in the United States targeting the swift programming. A man of such knowledge and strength will be deeply missed.

Summary

In this chapter we have seen all the details of the Platino game gngine. We have given a brief introduction to it and covered details of the core features of the game engine.

CHAPTER 3

Installing and Setting Up Platino Game Engine

In Chapter 2 we had an introduction to the Platino game engine and the people behind it. This game engine is based on Titanium SDK, as we discussed. The process of integrating Platino game engine is handled via Titanium SDK, so this chapter covers how to install the Platino game engine within a Windows environment.

The Content

In this chapter we cover the dependencies and the installation process for the Platino game engine. The content of the chapter is given here.

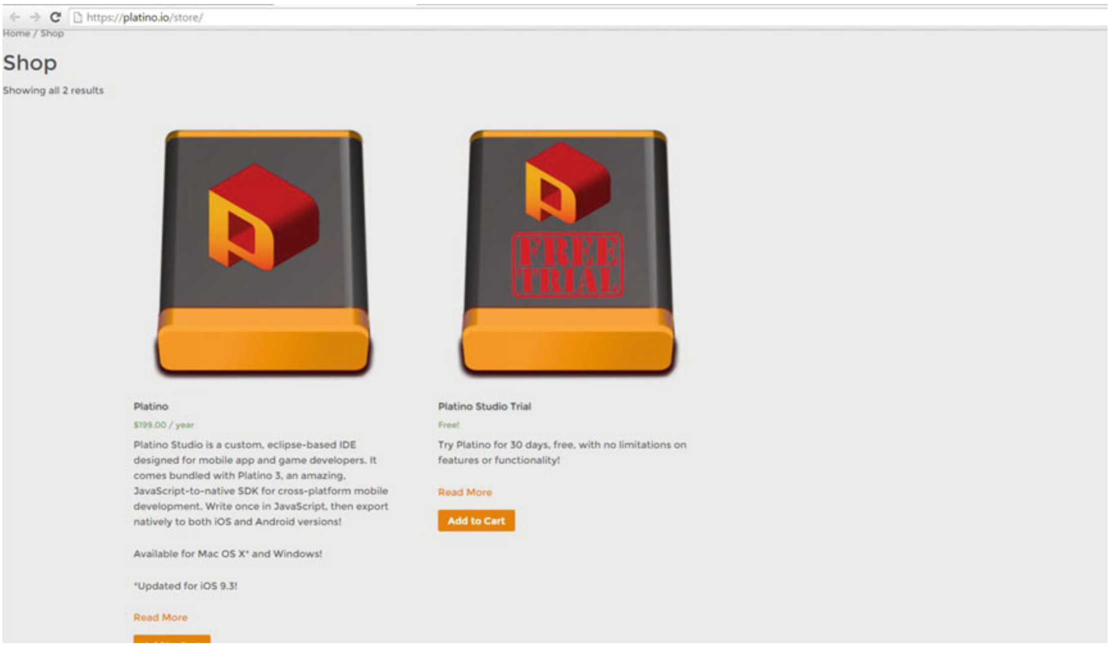
- The Platino Store and the process of getting Platino
- Installation of the Platino game engine

The Platino Store and the Process of Getting Platino

The way to get the Platino game engine is online. The Platino game engine is available for download from the Platino Store (`http:/platino.io/store`).

In the store, there are two options for downloading Platino. A Platino Studio 30-day trial version has no limitations on features and functionality. The other version, of the full version of Platino, is available for $199 per year. The store looks like Figure 3-1.

A. Nandy and D. Chanda, *Beginning Platino Game Engine*, DOI 10.1007/978-1-4842-2484-7_3



Shop

Showing all 2 results

Platino

$199.00 / year

Platino Studio is a custom, eclipse-based IDE designed for mobile app and game developers. It comes bundled with Platino 3, an amazing, JavaScript-to-native SDK for cross-platform mobile development. Write once in JavaScript, then export natively to both iOS and Android versions!

Available for Mac OS X* and Windows!

*Updated for iOS 9.3!

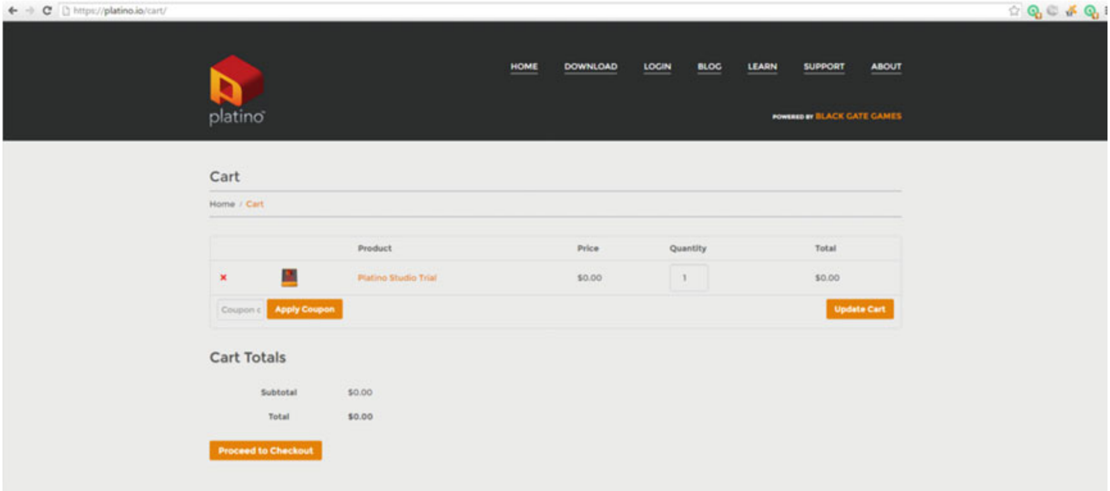
Platino Studio Trial

Free!

Try Platino for 30 days, free, with no limitations on features or functionality!

Figure 3-1. *Platino Store download options*

Make your selection and click Add to Cart. Figure 3-2 shows how the cart is updated.



Cart

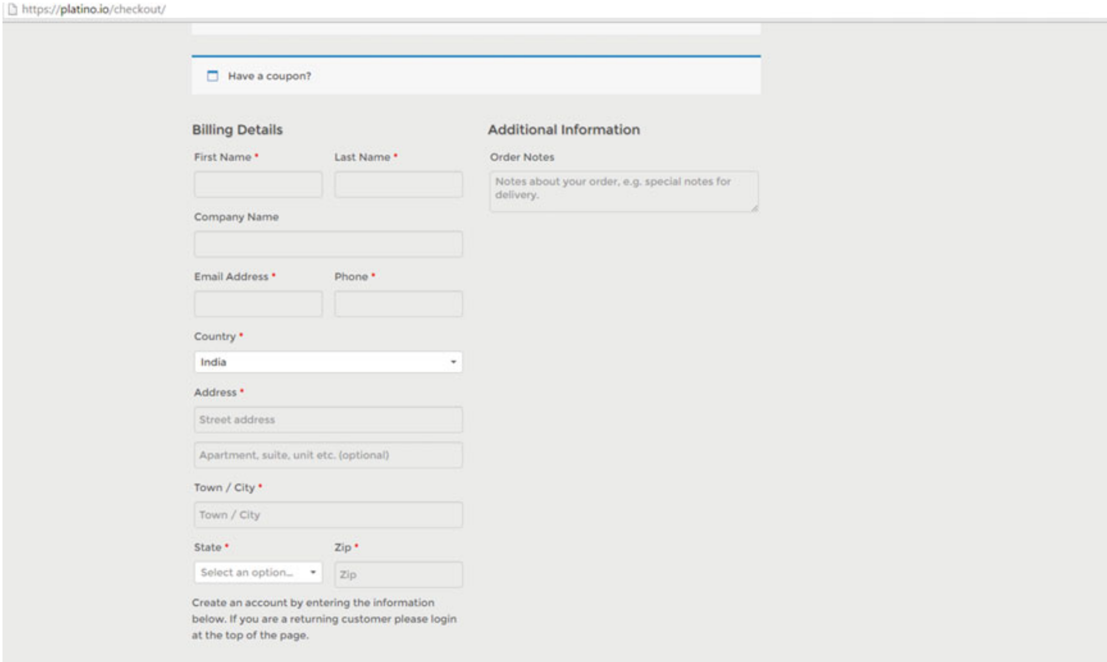
		Product	Price	Quantity	Total
×		Platino Studio Trial	$0.00	1	$0.00

Cart Totals

Subtotal	$0.00
Total	$0.00

Figure 3-2. *Adding a product to the cart*

Click Proceed to Checkout to move to the checkout page. There you need to fill in all the details to continue the download. The checkout page looks like Figure 3-3.



https://platino.io/checkout/

□ Have a coupon?

Billing Details

First Name * Last Name *

Company Name

Email Address * Phone *

Country *

India

Address *

Street address

Apartment, suite, unit etc. (optional)

Town / City *

Town / City

State * Zip *

Select an option... Zip

Create an account by entering the information below. If you are a returning customer please login at the top of the page.

Additional Information

Order Notes

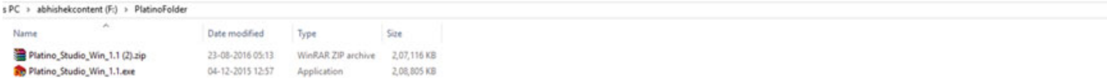
Notes about your order, e.g. special notes for delivery.

***Figure 3-3.** The checkout page*

When you fill in the details and create an account, you can then place your order. The download link will then be sent to your e-mail. From the download link, choose your operating system and start your download.

Installation of Platino Game Engine

Once you downloaded the linked file, the compressed file is saved on your computer. You need to unzip it. Once you do, the installation file (Figure 3-4) is ready to be updated and installed to get you started with Platino.

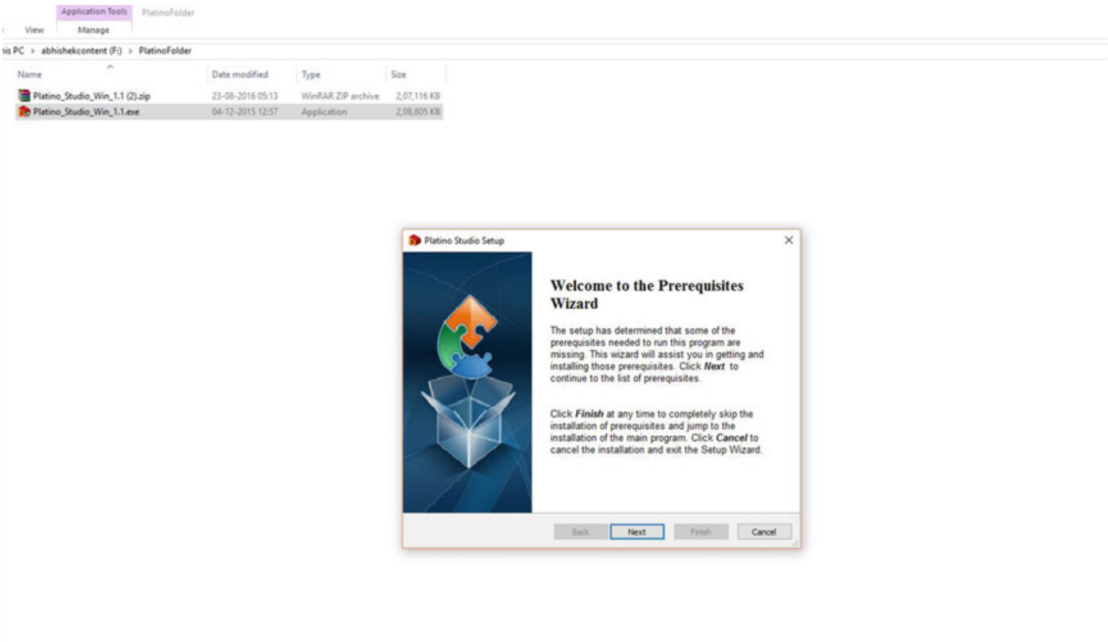


s PC › abhishekcontent (F:) › PlatinoFolder

Name	Date modified	Type	Size
Platino_Studio_Win_1.1 (2).zip	23-08-2016 05:13	WinRAR ZIP archive	2,07,116 KB
Platino_Studio_Win_1.1.exe	04-12-2015 12:57	Application	2,08,805 KB

***Figure 3-4.** Platino Studio setup file*

Double-click the .exe file to start the installation process, then click Next to continue, as shown in Figure 3-5.



Name	Date modified	Type	Size
Platino_Studio_Win_1.1 (2).zip	23-08-2016 05:13	WinRAR ZIP archive	2,07,116 KB
Platino_Studio_Win_1.1.exe	04-12-2015 12:57	Application	2,08,805 KB

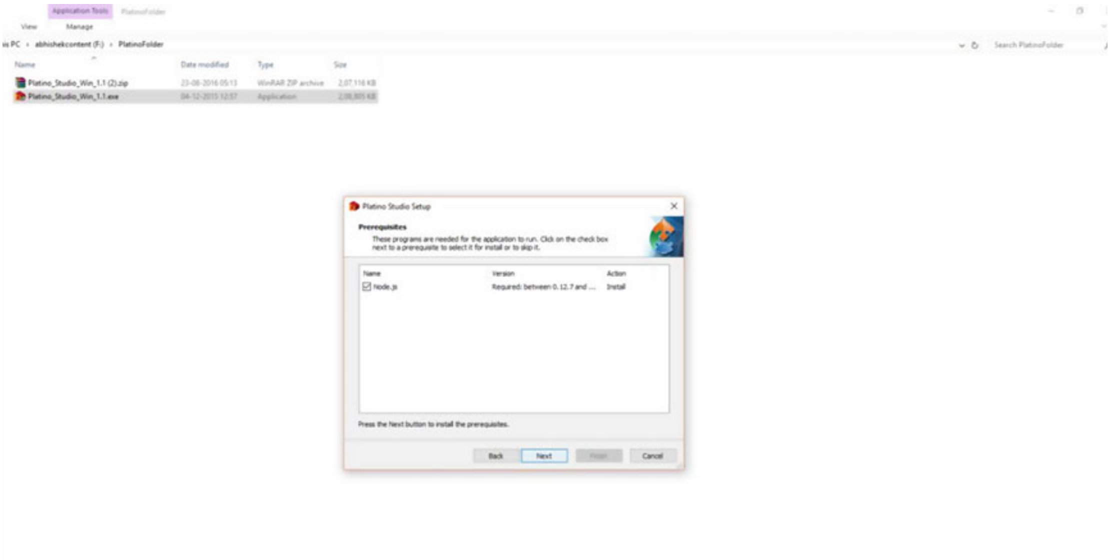
Welcome to the Prerequisites Wizard

The setup has determined that some of the prerequisites needed to run this program are missing. This wizard will assist you in getting and installing those prerequisites. Click ***Next*** to continue to the list of prerequisites.

Click ***Finish*** at any time to completely skip the installation of prerequisites and jump to the installation of the main program. Click ***Cancel*** to cancel the installation and exit the Setup Wizard.

Figure 3-5. *Starting the installation process*

As the installation starts, the Platino package able to detect dependencies and prompts the user to install the dependencies. The first dependency is node.js: If it is not on your computer, it will start installing from the Web as shown in Figure 3-6. Click Next to proceed with the installation. The Node.js dependency is a very powerful and very useful open source cross-platform JavaScript runtime environment for creating tools and applications that are easy to use. Node.js uses event-driven architecture for its development and packaging, with a wonderful usage of asynchronous I/O. Node.js allows useful operation of creating web servers and networking tools using JavaScript that can handle various amounts of core functionality that evolves the architecture quickly. The installation process is shown in Figure 3-7, where the Node.js installation wizard starts.



Name	Date modified	Type	Size
Platino_Studio_Win_1.1 (2).zip	23-08-2016 05:13	WinRAR ZIP archive	2,07,116 KB
Platino_Studio_Win_1.1.exe	04-12-2015 12:57	Application	2,08,805 KB

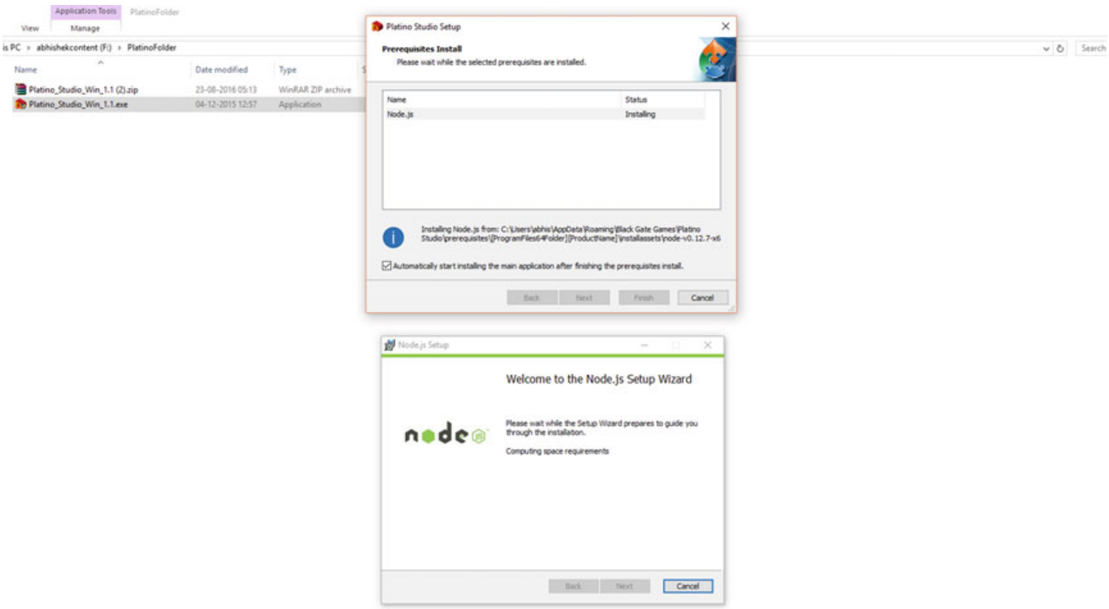
Prerequisites

These programs are needed for the application to run. Click on the check box next to a prerequisite to select it for install or to skip it.

Name	Version	Action
☑ Node.js	Required: between 0.12.7 and ...	Install

Press the Next button to install the prerequisites.

Figure 3-6. *Installing the first dependency*



Name	Date modified	Type
Platino_Studio_Win_1.1 (2).zip	23-08-2016 05:13	WinRAR ZIP archive
Platino_Studio_Win_1.1.exe	04-12-2015 12:57	Application

Prerequisites Install

Please wait while the selected prerequisites are installed.

Name	Status
Node.js	Installing

Installing Node.js from: C:\Users\abhis\AppData\Roaming\Black Gate Games\Platino Studio\prerequisites\[ProgramFiles64Folder][ProductName]\installassets\node-v0.12.7-x6

☑ Automatically start installing the main application after finishing the prerequisites install.

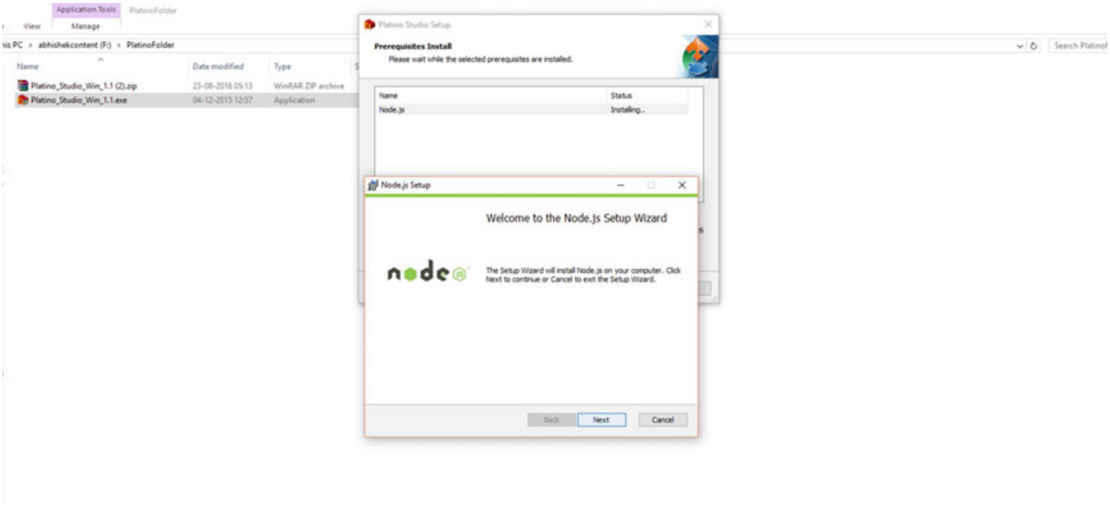
Welcome to the Node.js Setup Wizard

Please wait while the Setup Wizard prepares to guide you through the installation.

Computing space requirements

Figure 3-7. *The process of installation continues*

The Node.js Setup Wizard continues on its own. Just click Next as shown in Figure 3-8.



Name	Date modified	Type
Platino_Studio_Win_1.1 (2).zip	23-08-2016 05:13	WinRAR ZIP archive
Platino_Studio_Win_1.1.exe	04-12-2015 12:57	Application

Prerequisites Install
Please wait while the selected prerequisites are installed.

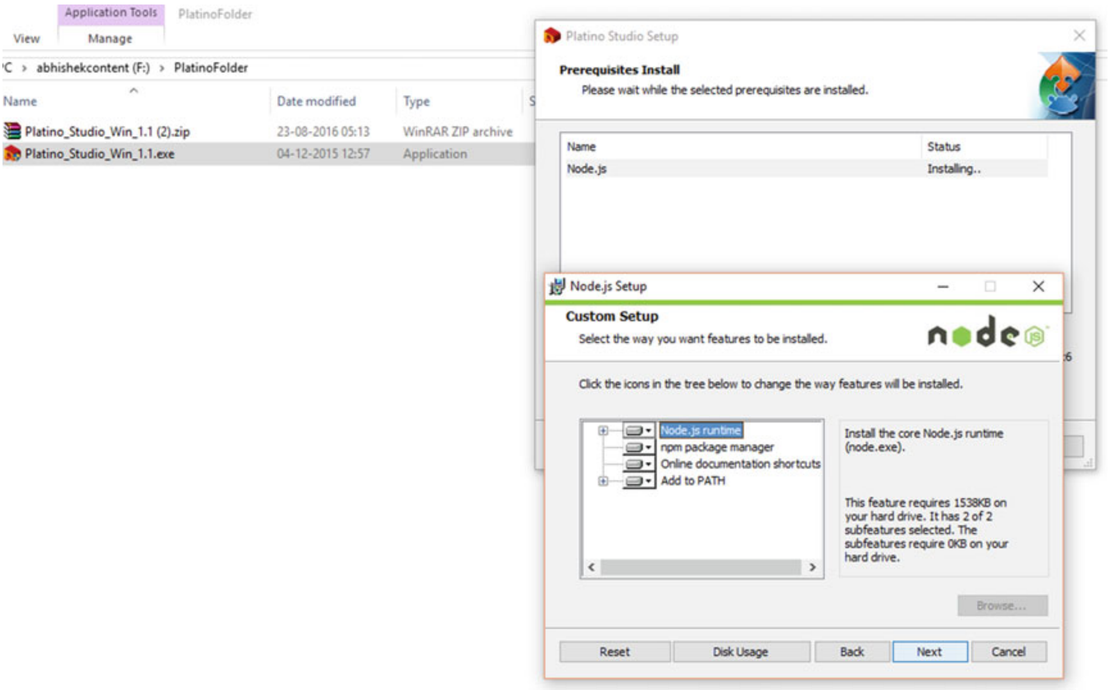
Name	Status
Node.js	Installing..

Welcome to the Node.js Setup Wizard

The Setup Wizard will install Node.js on your computer. Click Next to continue or Cancel to exit the Setup Wizard.

Figure 3-8. *Continuing the Node.js installation*

The setup configures the path and adds the details of Node.js to the environment variable. The path configuration and all the steps for a custom setup are shown in Figure 3-9.



Name	Date modified	Type
Platino_Studio_Win_1.1 (2).zip	23-08-2016 05:13	WinRAR ZIP archive
Platino_Studio_Win_1.1.exe	04-12-2015 12:57	Application

Prerequisites Install
Please wait while the selected prerequisites are installed.

Name	Status
Node.js	Installing..

Custom Setup
Select the way you want features to be installed.

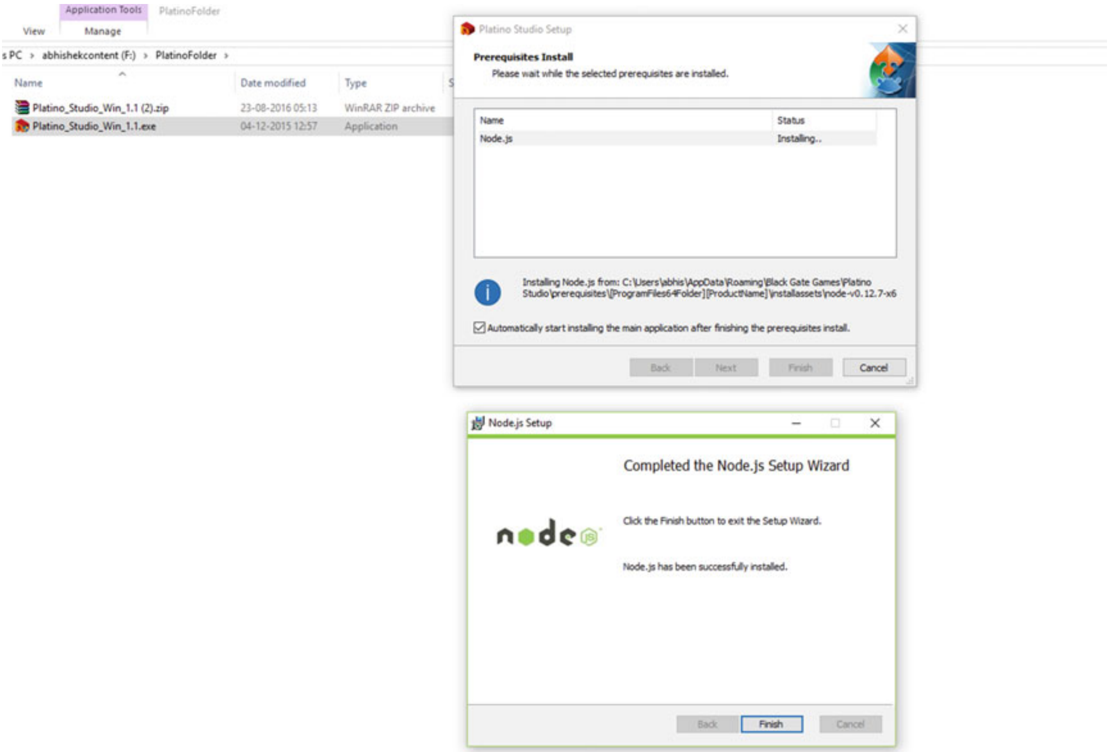
Click the icons in the tree below to change the way features will be installed.

Install the core Node.js runtime (node.exe).

This feature requires 1538KB on your hard drive. It has 2 of 2 subfeatures selected. The subfeatures require 0KB on your hard drive.

Figure 3-9. *The setup configures the path of Node.js*

In the next step, shown in Figure 3-10, we see that the setup for Node.js is complete, and the other dependencies for Paltino are installed next.



Platino Studio Setup

Prerequisites Install

Please wait while the selected prerequisites are installed.

Name	Status
Node.js	Installing..

Installing Node.js from: C:\Users\abhis\AppData\Roaming\Black Gate Games\Platino Studio\prerequisites\[ProgramFiles64Folder][ProductName]\installassets\node-v0.12.7-x6

☑ Automatically start installing the main application after finishing the prerequisites install.

Node.js Setup

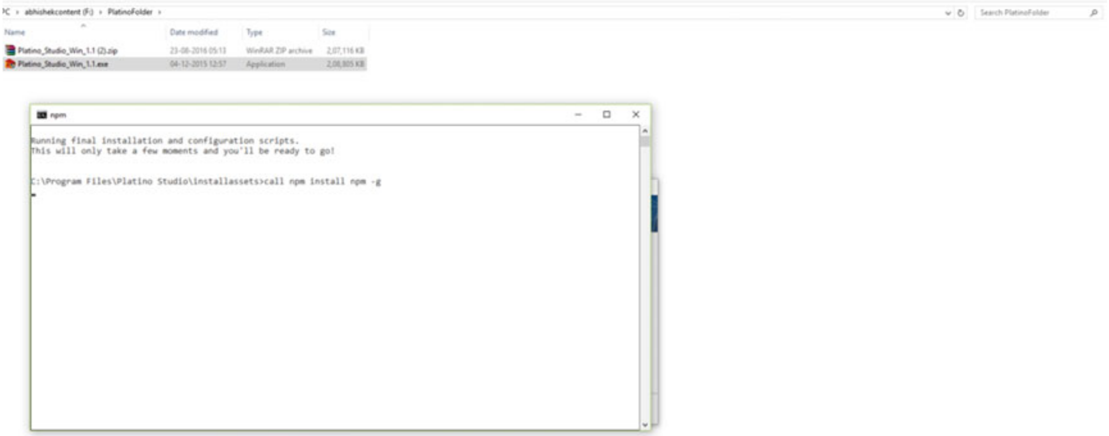
Completed the Node.js Setup Wizard

Click the Finish button to exit the Setup Wizard.

Node.js has been successfully installed.

Figure 3-10. *Node.js installation complete*

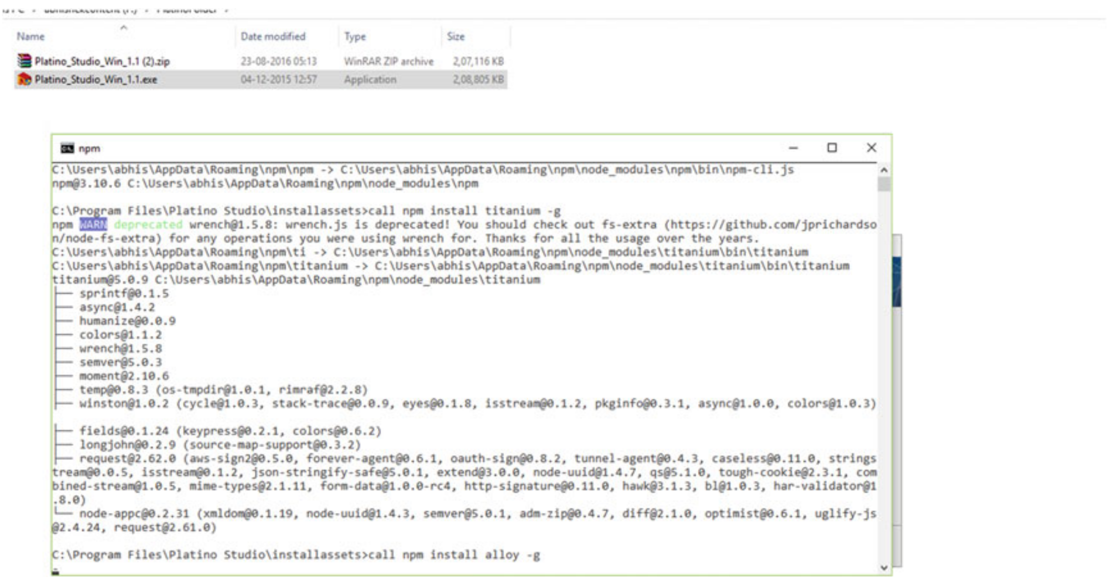
The next step works on getting the configuration scripts ready. You will see a console window or command prompt (see Figure 3-11) that will guide you through the steps.



```
Running final installation and configuration scripts.
This will only take a few moments and you'll be ready to go!

C:\Program Files\Platino Studio\installassets>call npm install npm -g
_
```

Figure 3-11. *Command prompt starts its scripting process*

In the next step the command prompt installs the Titanium SDK and also configures the setup for installing the Alloy framework, which is necessary for getting the Platino game engine installed. Figure 3-12 shows you this step.

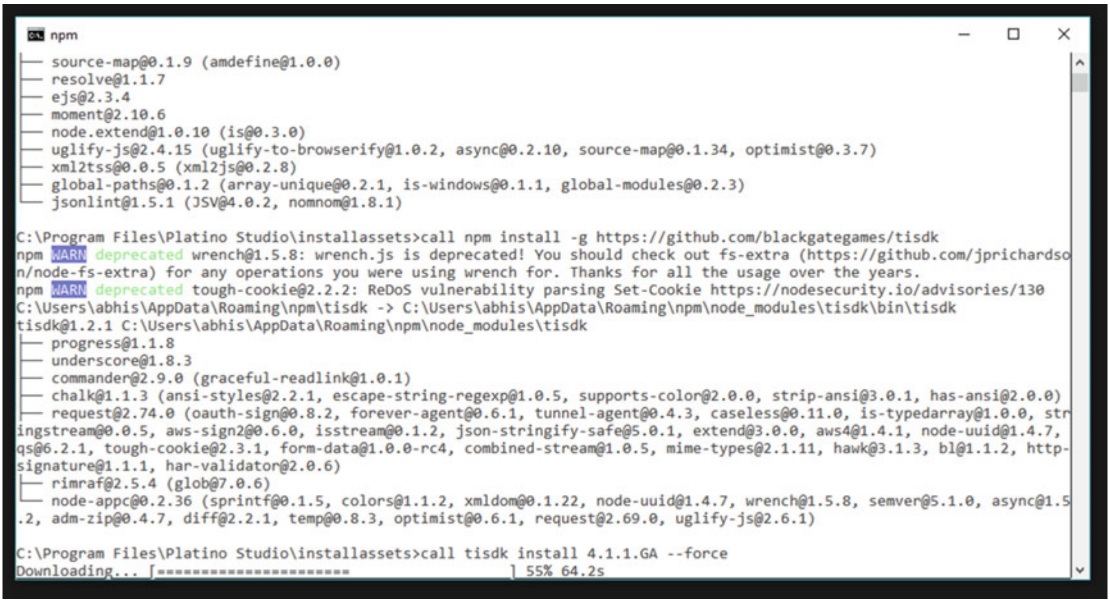


Name	Date modified	Type	Size
Platino_Studio_Win_1.1 (2).zip	23-08-2016 05:13	WinRAR ZIP archive	2,07,116 KB
Platino_Studio_Win_1.1.exe	04-12-2015 12:57	Application	2,08,805 KB

```
C:\Users\abhis\AppData\Roaming\npm\npm -> C:\Users\abhis\AppData\Roaming\npm\node_modules\npm\bin\npm-cli.js
npm@3.10.6 C:\Users\abhis\AppData\Roaming\npm\node_modules\npm

C:\Program Files\Platino Studio\installassets>call npm install titanium -g
npm WARN deprecated wrench@1.5.8: wrench.js is deprecated! You should check out fs-extra (https://github.com/jprichardso
n/node-fs-extra) for any operations you were using wrench for. Thanks for all the usage over the years.
C:\Users\abhis\AppData\Roaming\npm\ti -> C:\Users\abhis\AppData\Roaming\npm\node_modules\titanium\bin\titanium
C:\Users\abhis\AppData\Roaming\npm\titanium -> C:\Users\abhis\AppData\Roaming\npm\node_modules\titanium\bin\titanium
titanium@5.0.9 C:\Users\abhis\AppData\Roaming\npm\node_modules\titanium
├── sprintf@0.1.5
├── async@1.4.2
├── humanize@0.0.9
├── colors@1.1.2
├── wrench@1.5.8
├── semver@5.0.3
├── moment@2.10.6
├── temp@0.8.3 (os-tmpdir@1.0.1, rimraf@2.2.8)
├── winston@1.0.2 (cycle@1.0.3, stack-trace@0.0.9, eyes@0.1.8, isstream@0.1.2, pkginfo@0.3.1, async@1.0.0, colors@1.0.3)

├── fields@0.1.24 (keypress@0.2.1, colors@0.6.2)
├── longjohn@0.2.9 (source-map-support@0.3.2)
├── request@2.62.0 (aws-sign2@0.5.0, forever-agent@0.6.1, oauth-sign@0.8.2, tunnel-agent@0.4.3, caseless@0.11.0, strings
tream@0.0.5, isstream@0.1.2, json-stringify-safe@5.0.1, extend@3.0.0, node-uuid@1.4.7, qs@5.1.0, tough-cookie@2.3.1, com
bined-stream@1.0.5, mime-types@2.1.11, form-data@1.0.0-rc4, http-signature@0.11.0, hawk@3.1.3, bl@1.0.3, har-validator@1
.8.0)
└── node-appc@0.2.31 (xmldom@0.1.19, node-uuid@1.4.3, semver@5.0.1, adm-zip@0.4.7, diff@2.1.0, optimist@0.6.1, uglify-js
@2.4.24, request@2.61.0)

C:\Program Files\Platino Studio\installassets>call npm install alloy -g
```

Figure 3-12. Installing Titanium SDK

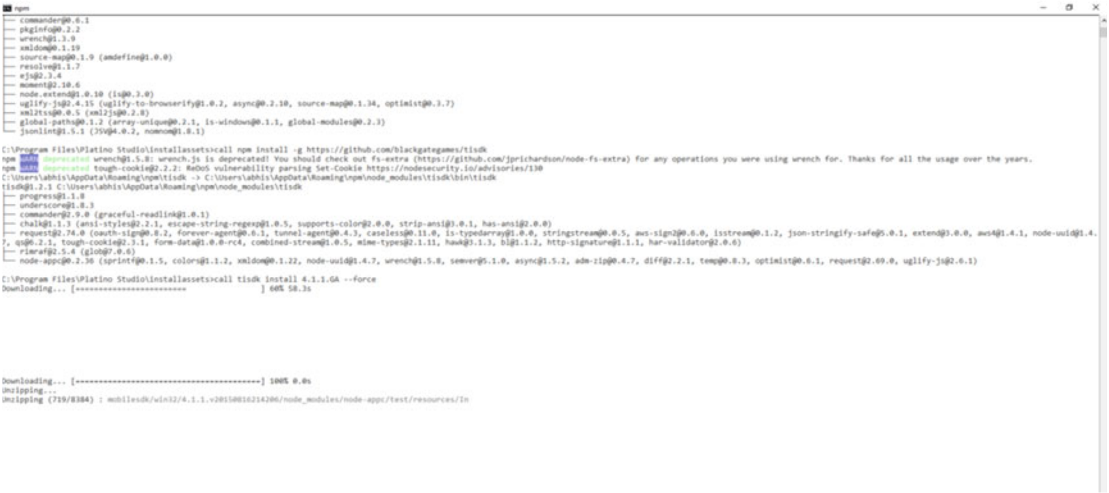
The next step installs the dependencies of Titanium SDK step by step, as shown in Figure 3-13.



```
├── source-map@0.1.9 (amdefine@1.0.0)
├── resolve@1.1.7
├── ejs@2.3.4
├── moment@2.10.6
├── node.extend@1.0.10 (is@0.3.0)
├── uglify-js@2.4.15 (uglify-to-browserify@1.0.2, async@0.2.10, source-map@0.1.34, optimist@0.3.7)
├── xml2tss@0.0.5 (xml2js@0.2.8)
├── global-paths@0.1.2 (array-unique@0.2.1, is-windows@0.1.1, global-modules@0.2.3)
└── jsonlint@1.5.1 (JSV@4.0.2, nomnom@1.8.1)

C:\Program Files\Platino Studio\installassets>call npm install -g https://github.com/blackgategames/tisdk
npm WARN deprecated wrench@1.5.8: wrench.js is deprecated! You should check out fs-extra (https://github.com/jprichardso
n/node-fs-extra) for any operations you were using wrench for. Thanks for all the usage over the years.
npm WARN deprecated tough-cookie@2.2.2: ReDoS vulnerability parsing Set-Cookie https://nodesecurity.io/advisories/130
C:\Users\abhis\AppData\Roaming\npm\tisdk -> C:\Users\abhis\AppData\Roaming\npm\node_modules\tisdk\bin\tisdk
tisdk@1.2.1 C:\Users\abhis\AppData\Roaming\npm\node_modules\tisdk
├── progress@1.1.8
├── underscore@1.8.3
├── commander@2.9.0 (graceful-readlink@1.0.1)
├── chalk@1.1.3 (ansi-styles@2.2.1, escape-string-regexp@1.0.5, supports-color@2.0.0, strip-ansi@3.0.1, has-ansi@2.0.0)
├── request@2.74.0 (oauth-sign@0.8.2, forever-agent@0.6.1, tunnel-agent@0.4.3, caseless@0.11.0, is-typedarray@1.0.0, str
ingstream@0.0.5, aws-sign2@0.6.0, isstream@0.1.2, json-stringify-safe@5.0.1, extend@3.0.0, aws4@1.4.1, node-uuid@1.4.7,
qs@6.2.1, tough-cookie@2.3.1, form-data@1.0.0-rc4, combined-stream@1.0.5, mime-types@2.1.11, hawk@3.1.3, bl@1.1.2, http-
signature@1.1.1, har-validator@2.0.6)
├── rimraf@2.5.4 (glob@7.0.6)
└── node-appc@0.2.36 (sprintf@0.1.5, colors@1.1.2, xmldom@0.1.22, node-uuid@1.4.7, wrench@1.5.8, semver@5.1.0, async@1.5
.2, adm-zip@0.4.7, diff@2.2.1, temp@0.8.3, optimist@0.6.1, request@2.69.0, uglify-js@2.6.1)

C:\Program Files\Platino Studio\installassets>call tisdk install 4.1.1.GA --force
Downloading... [======================                      ] 55% 64.2s
```

Figure 3-13. *Dependencies getting downloaded*

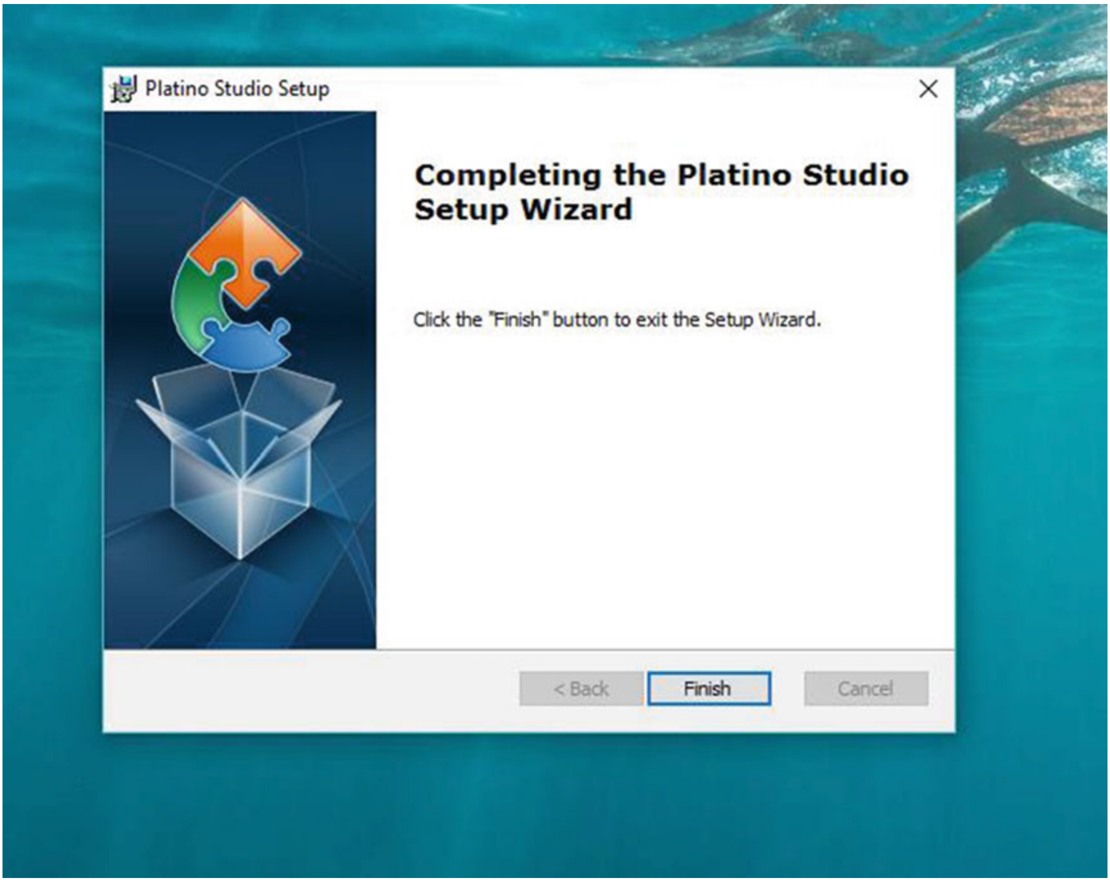
In the next step, you will see that all the dependencies have been installed. That download of the Titanium SDK dependencies is complete and you will get a 100% completion message in the command prompt window. This process is shown in Figure 3-14.



```
├── commander@0.6.1
├── pkginfo@0.2.2
├── wrench@1.3.9
├── xmldom@0.1.19
├── source-map@0.1.9 (amdefine@1.0.0)
├── resolve@1.1.7
├── ejs@2.3.4
├── moment@2.10.6
├── node.extend@1.0.10 (is@0.3.0)
├── uglify-js@2.4.15 (uglify-to-browserify@1.0.2, async@0.2.10, source-map@0.1.34, optimist@0.3.7)
├── xml2tss@0.0.5 (xml2js@0.2.8)
├── global-paths@0.1.2 (array-unique@0.2.1, is-windows@0.1.1, global-modules@0.2.3)
└── jsonlint@1.5.1 (JSV@4.0.2, nomnom@1.8.1)

C:\Program Files\Platino Studio\installassets>call npm install -g https://github.com/blackgategames/tisdk
npm WARN deprecated wrench@1.5.8: wrench.js is deprecated! You should check out fs-extra (https://github.com/jprichardson/node-fs-extra) for any operations you were using wrench for. Thanks for all the usage over the years.
npm WARN deprecated tough-cookie@2.2.2: ReDoS vulnerability parsing Set-Cookie https://nodesecurity.io/advisories/130
C:\Users\abhis\AppData\Roaming\npm\tisdk -> C:\Users\abhis\AppData\Roaming\npm\node_modules\tisdk\bin\tisdk
tisdk@1.2.1 C:\Users\abhis\AppData\Roaming\npm\node_modules\tisdk
├── progress@1.1.8
├── underscore@1.8.3
├── commander@2.9.0 (graceful-readlink@1.0.1)
├── chalk@1.1.3 (ansi-styles@2.2.1, escape-string-regexp@1.0.5, supports-color@2.0.0, strip-ansi@3.0.1, has-ansi@2.0.0)
├── request@2.74.0 (oauth-sign@0.8.2, forever-agent@0.6.1, tunnel-agent@0.4.3, caseless@0.11.0, is-typedarray@1.0.0, stringstream@0.0.5, aws-sign2@0.6.0, isstream@0.1.2, json-stringify-safe@5.0.1, extend@3.0.0, aws4@1.4.1, node-uuid@1.4.
7, qs@6.2.1, tough-cookie@2.3.1, form-data@1.0.0-rc4, combined-stream@1.0.5, mime-types@2.1.11, hawk@3.1.3, bl@1.1.2, http-signature@1.1.1, har-validator@2.0.6)
├── rimraf@2.5.4 (glob@7.0.6)
└── node-appc@0.2.36 (sprintf@0.1.5, colors@1.1.2, xmldom@0.1.22, node-uuid@1.4.7, wrench@1.5.8, semver@5.1.0, async@1.5.2, adm-zip@0.4.7, diff@2.2.1, temp@0.8.3, optimist@0.6.1, request@2.69.0, uglify-js@2.6.1)

C:\Program Files\Platino Studio\installassets>call tisdk install 4.1.1.GA --force
Downloading... [========================                ] 60% 58.3s




Downloading... [========================================] 100% 0.0s
Unzipping...
Unzipping (719/8384) : mobilesdk/win32/4.1.1.v20150816214206/node_modules/node-appc/test/resources/In
```

Figure 3-14. *The completed download process*

After the dependencies are installed, if installation was successful, the Platino Studio Setup Wizard will reach the final step. Simply click Finish, as shown in Figure 3-15.

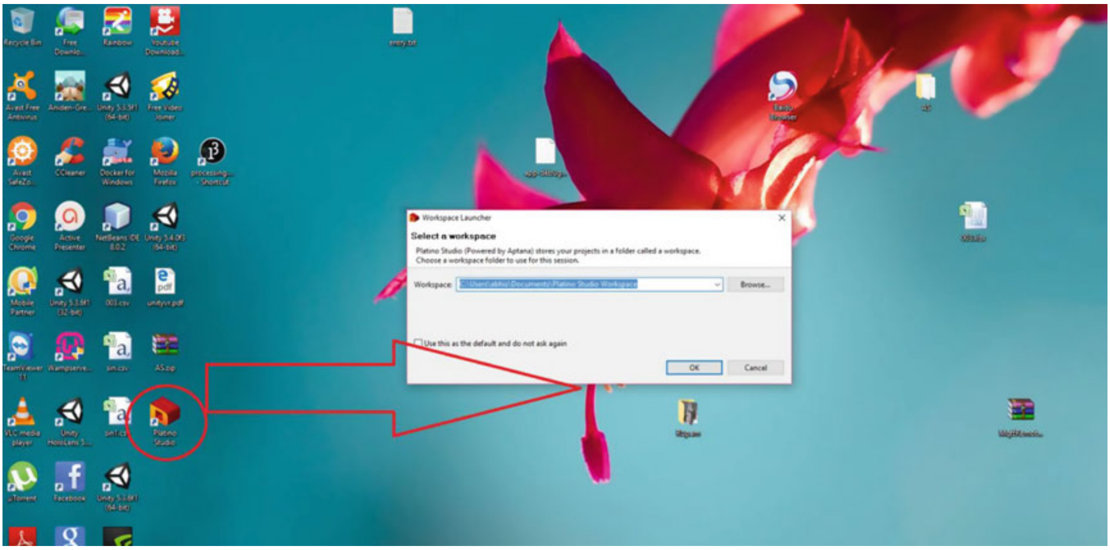


Completing the Platino Studio Setup Wizard

Click the "Finish" button to exit the Setup Wizard.

Figure 3-15. *Completing installation of the Platino game engine*

Now you can start the Platino game engine from the desktop. Once a workspace opens, click OK, as shown in Figure 3-16, to continue to use the engine.



Workspace Launcher

Select a workspace

Platino Studio (Powered by Aptana) stores your projects in a folder called a workspace.
Choose a workspace folder to use for this session.

Workspace: C:\Users\abhis\Documents\Platino Studio Workspace

□ Use this as the default and do not ask again

Figure 3-16. *Starting the engine*

The Platino game engine opens (Figure 3-17) and you are ready to work with your first project.

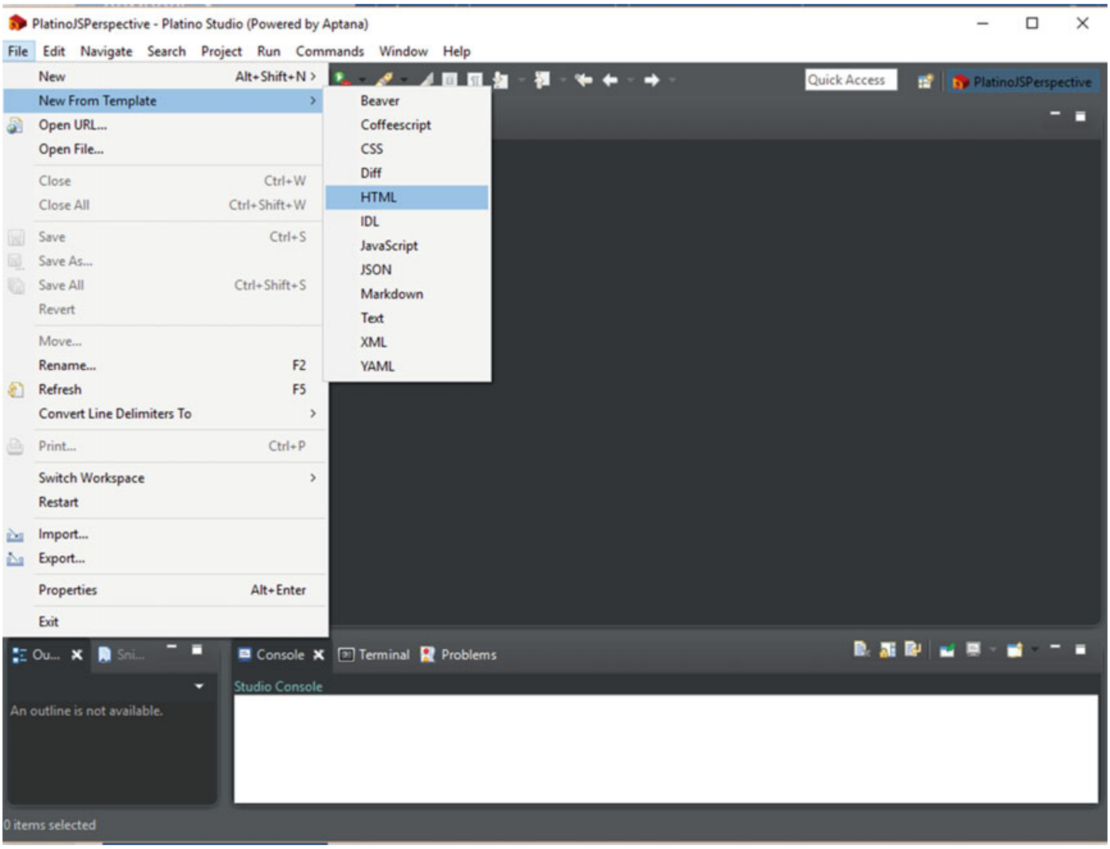


Figure 3-17. Platino Studio

Summary

This chapter has provided the basic steps for setting up the Platino game engine. Wizards run the configuration scripts and install the Platino game engine. In the next chapter, we will start the development process.

CHAPTER 4

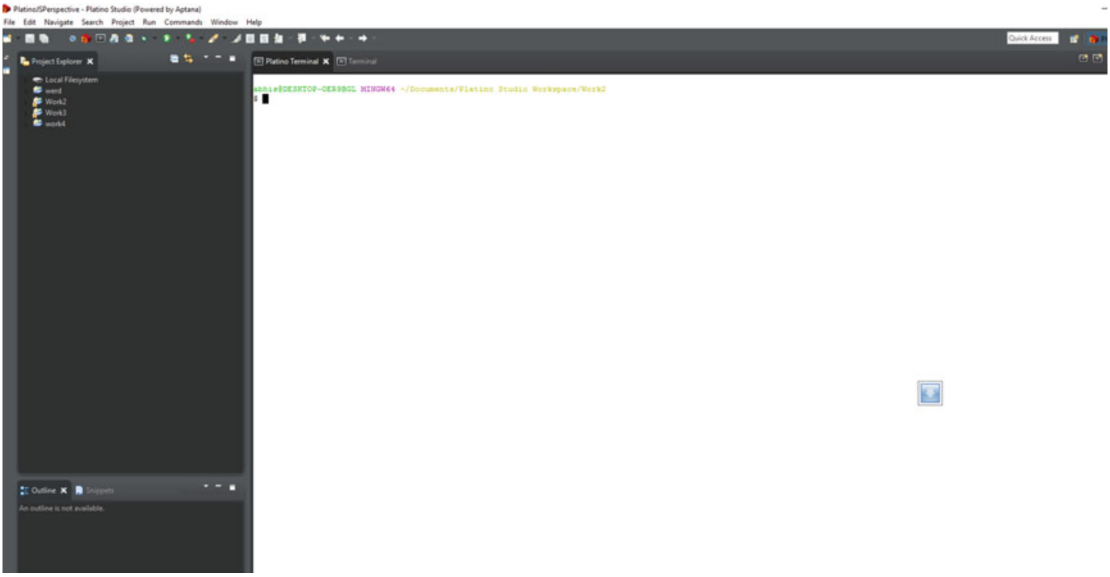
Getting into Development with Platino Game Engine

In Chapter 3 we saw how to install the Platino game engine. In this chapter, we work on developing apps with it. Our primary target is to see the features of the engine and how we can take advantage of them.

Let’s Make an App

We will start working on a web app first with Platino, in terms of gamification only.

When we open Game Studio, it looks like Figure 4-1.

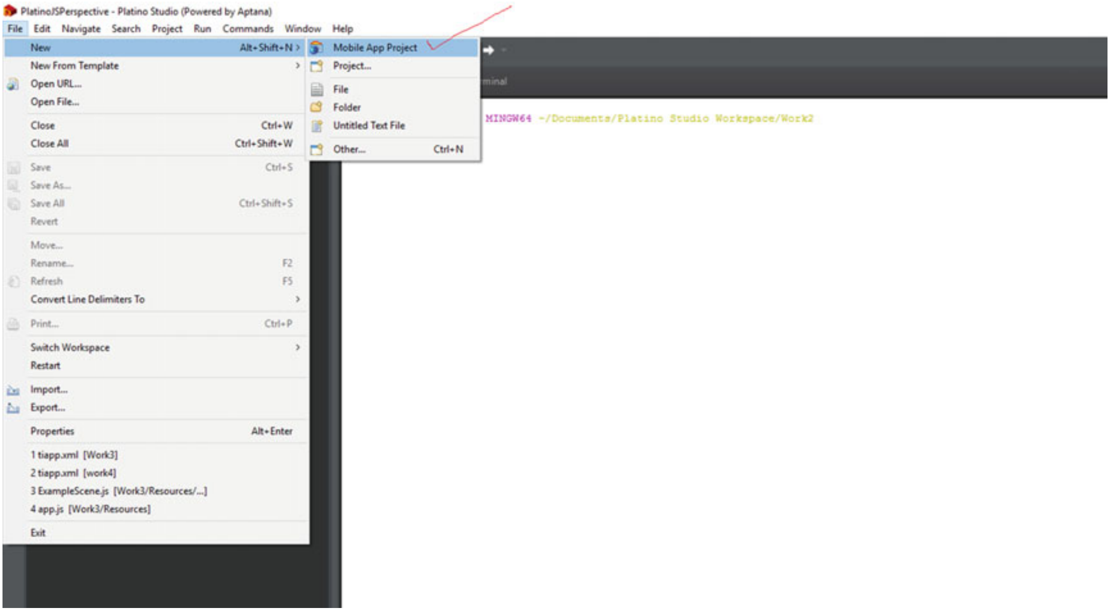

PlatinoJSPerspective - Platino Studio (Powered by Aptana)
File Edit Navigate Search Project Run Commands Window Help
Quick Access
Project Explorer
Local Filesystem
werd
Work2
Work3
work4
Platino Terminal
Terminal
Outline
Snippets
An outline is not available.

```
abhis@DESKTOP-OER9BGL MINGW64 ~/Documents/Platino Studio Workspace/Work2
$
```

Figure 4-1. *Platino Studio open in Windows*

In the top left corner, click File. Click New, and then click Mobile App Project, as shown in Figure 4-2.

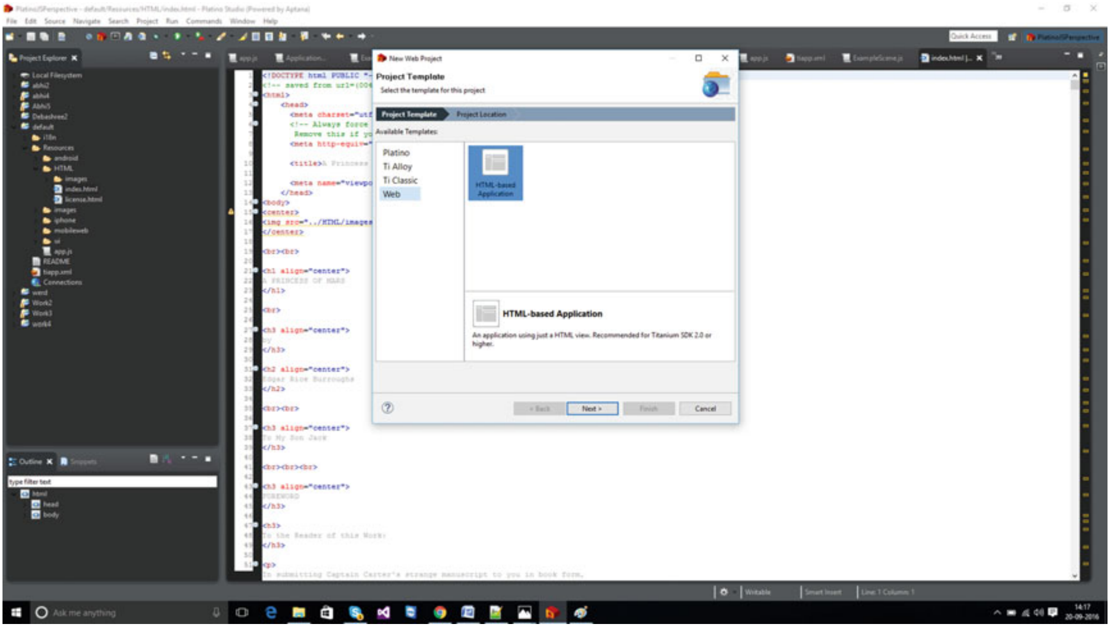
A. Nandy and D. Chanda, *Beginning Platino Game Engine*, DOI 10.1007/978-1-4842-2484-7_4



```
MINGW64 ~/Documents/Platino Studio Workspace/Work2
```

Figure 4-2. *Opening a new mobile project*

Within the mobile app project, there are several project templates. Select web and then select HTML-based Application, as shown in Figure 4-3, and then click Next.

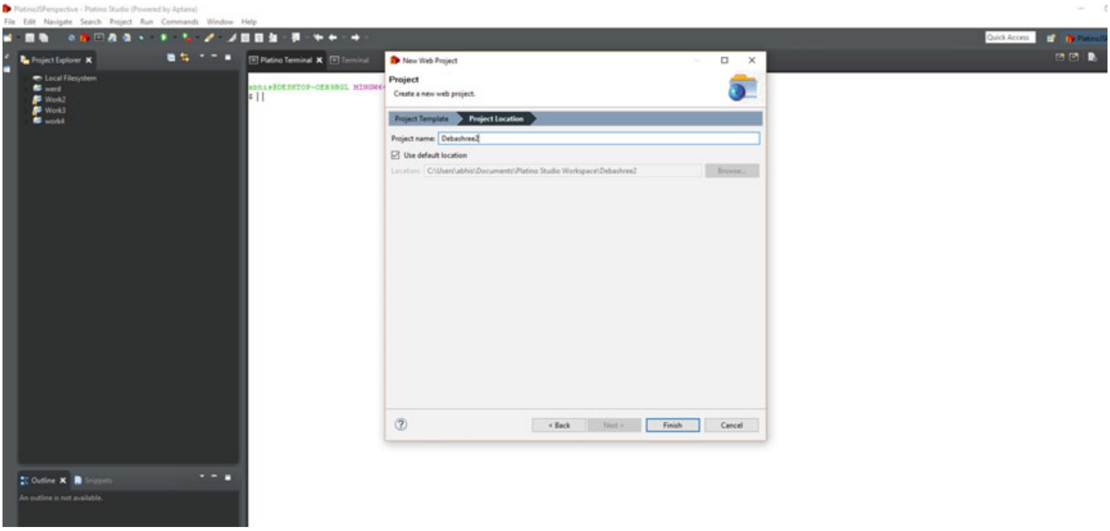


An application using just a HTML view. Recommended for Titanium SDK 2.0 or higher.

```
<!DOCTYPE html PUBLIC "-
<!-- saved from url=(00
<html>
    <head>
      <meta charset="utf
      <!-- Always force
       Remove this if yo
      <meta http-equiv="

      <title>A Princess

      <meta name="viewpo
    </head>
<body>
<center>
<img src="../HTML/images
</center>

<br><br>

<h1 align="center">
A PRINCESS OF MARS
</h1>

<br>

<h3 align="center">
by
</h3>

<h2 align="center">
Edgar Rice Burroughs
</h2>

<br><br>

<h3 align="center">
To My Son Jack
</h3>

<br><br><br>

<h3 align="center">
FOREWORD
</h3>

<h3>
To the Reader of this Work:
</h3>

<p>
In submitting Captain Carter's strange manuscript to you in book form.
```

Figure 4-3. *Starting with a web project*

The next step is to name the project. In the example in Figure 4-4, the name is Debashree2. Click Finish.



New Web Project

Project

Create a new web project.

Project name: Debashree2

☑ Use default location

Location: C:\Users\abhis\Documents\Platino Studio Workspace\Debashree2

Figure 4-4. *Naming the project*

Let's take a look at Figure 4-5, which displays the file structure of the project.

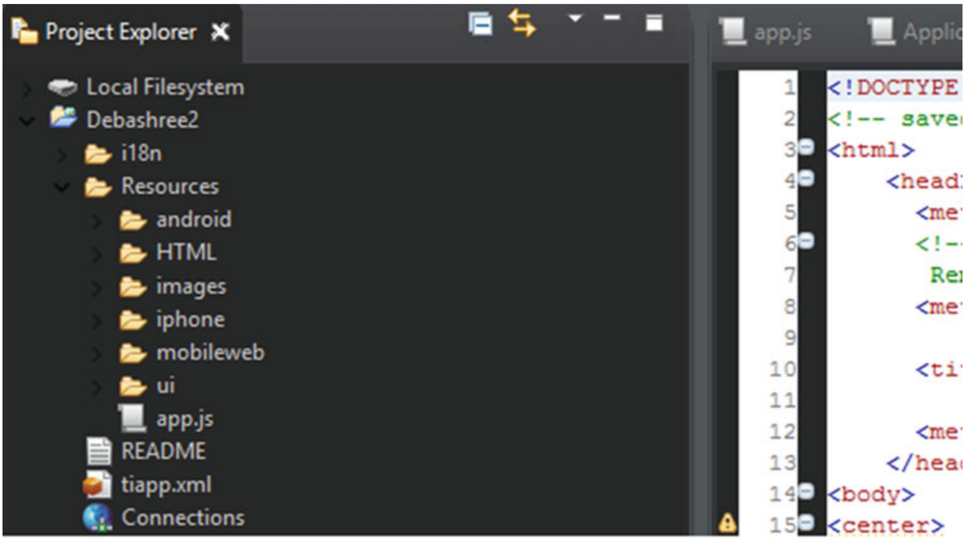


Figure 4-5. *The file structure of the project*

If you just go through the directory of the project, you can see we have these files within it.

- I18n
- Resources

- App.js
- Readme
- Tiapp.xml
- Connections

I18n is used for localization and is very useful for translation. Resources is the main location where we have definitions targeted for different operating systems. Here you get the detailed files that are required to make your app cross-platform.

Let's take a look in Listing 4-1 at how the Android cross-platform utility works and how the task is handled in the background by `ApplicationWindowPlatform.js`.

Listing 4-1. The Code for Handling Android Activity

```
// Application Window Component Constructor, Android specific
function ApplicationWindowPlatform(/*TiUIWindow*/self, /*TiUIView*/webView, /*boolean*/
titleBarOn, /*boolean*/drawerOn) {
    // A note about the NavBar:
    // - We use the nav bar along with some navigation buttons on iOS.
    // - We use the menu on Android to handle forward/back
    // - For mobile web, we rely on the forward/back button in the browser

    if(titleBarOn) {
        // When the webview loads, set the title and enable the left/right nav button
        webView.addEventListener('load', function(e) {
            self.title = webView.evalJS('document.title');
        });
    }

    // Handle Android back button.
    self.addEventListener('android:back', function() {
        if(webView.canGoBack()) {
            webView.goBack();
        } else {
            self.close();
        }
    });

    if (drawerOn) {
        // Create the Android menu.
        var FORWARD = 1, BACK = 2;
        var activity = self.activity;
        activity.onCreateOptionsMenu = function(e) {
            var menu = e.menu;
            var menuItem = menu.add({
                title : L('back'),
                itemId : BACK
            });
            menuItem.setIcon('/images/LeftArrow.png');
            menuItem.addEventListener('click', function(e) {
                webView.goBack();
            });
            menuItem = menu.add({
                title : L('forward'),
                itemId : FORWARD
            });
            menuItem.setIcon('/images/RightArrow.png');
            menuItem.addEventListener('click', function(e) {
                webView.goForward();
            });
        };
        activity.onPrepareOptionsMenu = function(e) {
            var menu = e.menu;
            var menuItem = menu.findItem(BACK);
            menuItem.enabled = webView.canGoBack();
            menuItem = menu.findItem(FORWARD);
            menuItem.enabled = webView.canGoForward();
        };
    }
}

module.exports = ApplicationWindowPlatform;
```

This is autogenerated code when we create the project. You see in the code that it creates the main menu and also handles the back button.

For handling phone events, you can see there are two JavaScript files generated by the project:

- `ApplicationPlatformWindow.js`
- `Drawer.js`

All are handled on the UI files of the project because the result is how the UI looks within an iOS device (see Listing 4-2).

Listing 4-2. The Code for Handling iOS Flow of an App

```
// Application Window Component Constructor, platform specific features
function ApplicationWindowPlatform(/*TiUIWindow*/self, /*TiUIView*/webView, /*boolean*/
titleBarOn, /*boolean*/drawerOn) {

     if (titleBarOn) {
        // When the webview loads, set the title
        webView.addEventListener('load', function(e) {
            self.title = webView.evalJS('document.title');
        });

    }

    if (drawerOn) {
        // Put a back/forward button into a drawer at the bottom of the screen that can be
        // opened when needed.
        var Drawer = require('/ui/Drawer');
        var drawer = new Drawer(self);
        var backButton = Ti.UI.createButton({
            backgroundImage: '/images/LeftArrow.png' ,
            width: 48,
            height: 48
        });
        backButton.addEventListener('click', function (e) {
            webView.goBack();
        });
        drawer.buttonBar.add(backButton);
        var forwardButton = Ti.UI.createButton({
            backgroundImage: '/images/RightArrow.png' ,
            width: 48,
            height: 48
        });
        forwardButton.addEventListener('click', function (e) {
            webView.goForward();
        });
        drawer.buttonBar.add(forwardButton);

        self.add(drawer.view);
    }
}

module.exports = ApplicationWindowPlatform;
```

The `drawer.js` file adjusts itself for different screen sizes of an iOS device, as given in Listing 4-3.

Listing 4-3. The Code for Handling iOS Device Screens

```
/ Drawer containing a button bar to drag up from the bottom of the screen by pressing the
pull tab.
var pullTabSize = { width: 48, height: 16 };
var iconSize = { width: 48, height: 48 };
var opacity = 0.75;
var speed = 500;

// Gets all the applicable sizes based on the current size of the screen, used for initial
layout and handling rotation
// @opened  boolean Indicates whether the tray should be opened or closed when determine
dimensions.
function DrawerGetLayout(/*boolean*/opened, /*boolean*/titleBarOn) {
    var screenSize = { width: Ti.Platform.displayCaps.getPlatformWidth(), height:
Ti.Platform.displayCaps.getPlatformHeight() };
    var layout = {};

    // Account for the status bar
    var offset = 20;
    // Nav bar size is the same on iPhone portrait and all iPad orientations, shorter on
    iPhone landscape
    if (titleBarOn) {
        offset += (Ti.Platform.osname == 'iphone' && screenSize.width > screenSize.height ?
        32 : 44);
    }

    layout.pullTabButton = {
        left: (screenSize.width - pullTabSize.width) / 2,
        top: 0,
        width: pullTabSize.width,
        height: pullTabSize.height
    };
    layout.buttonBar = {
        left: 0,
        top: 0,
        width: 'auto',
        height: 'auto'
    };
    layout.view = {
        left: 0,
        top: screenSize.height - pullTabSize.height - offset,
        width: screenSize.width,
        height: pullTabSize.height + iconSize.height
    };

    if (opened) {
        layout.view.top -= iconSize.height;
    }

    return layout;
}

function DrawerRelayout() {
    // Relayout all elements for the drawer.
    var self = this;
    var layout = DrawerGetLayout(self.opened, !self.parent.navBarHidden);

    for (var i in layout) {
        if (layout.hasOwnProperty(i)) {
            for (var j in layout[i]) {
                if (layout[i].hasOwnProperty(j)) {
                    self[i][j] = layout[i][j];
                }
            }
        }
    }
}

function Drawer(/*TiUIWindow*/parent) {
    var self = this;

    self.parent = parent;
    self.opened = false;    // Start out with the drawer closed

     // The user clicks on the pull tab to open/close the drawer.
    self.pullTabButton = Ti.UI.createButton({
       backgroundImage: '/images/PullTab.png',
       opacity: opacity
    });
    self.pullTabButton.addEventListener('click', function PullTabClick(e) {
        if (self.opened) {
            self.close();
        } else {
            self.open();
        }
    });

   // Button bar below the pull tab
    self.buttonBar = Ti.UI.createView({
         backgroundColor: 'black',
        opacity: opacity,
        layout: 'horizontal'
    });

    // High level container
    self.view = Ti.UI.createView({
         layout: 'vertical'
     });
    self.view.add(self.pullTabButton);
    self.view.add(self.buttonBar);

    // Layout all of our elements.
    self.relayout();

    // Handle orientation.
    function relayout(e) {
        self.relayout();
    }
    parent.addEventListener("close", function parentClose(e) {
        Ti.Gesture.removeEventListener("orientationchange", relayout);
    });
    Ti.Gesture.addEventListener("orientationchange", relayout);

    return self;
}

function DrawerOpen() {
    this.fireEvent('open', {source: this, type: 'open'});

    if (this.opened) {
        return;     // Already opened.
    }
    this.opened = true;

    // Slide up
    var layout = DrawerGetLayout(this.opened, !this.parent.navBarHidden);
    var animation = Ti.UI.createAnimation({
       top: layout.view.top,
       duration: speed
    });
    this.view.animate(animation);
```

```
}

function DrawerClose() {
    this.fireEvent('close', {source: this, type: 'close'});

    if (!this.opened) {
        return;     // Already closed
    }
    this.opened = false;

    // Slide down
    var layout = DrawerGetLayout(this.opened,!this.parent.navBarHidden);
    var animation = Ti.UI.createAnimation({
       top: layout.view.top,
       duration: speed
    });
    this.view.animate(animation);
}

function DrawerAddEventListener(name, func) {
    Ti.App.addEventListener('drawer.'+ name, func);
}

function DrawerRemoveEventListener(name, func) {
    Ti.App.removeEventListener('drawer.'+ name, func);
}

function DrawerFireEvent(name, obj) {
    Ti.App.fireEvent('drawer.'+ name, obj);
}

Drawer.prototype.open = DrawerOpen;
Drawer.prototype.close = DrawerClose;
Drawer.prototype.addEventListener = DrawerAddEventListener;
Drawer.prototype.removeEventListener = DrawerRemoveEventListener;
Drawer.prototype.fireEvent = DrawerFireEvent;
Drawer.prototype.relayout = DrawerRelayout;
module.exports = Drawer;
```

If we want to check for dependencies, as in Listing 4-4, we have to mention it in the app.js file. Currently it checks for the minimum Titanium version to run the application. If we have specific dependencies, we can mention them here.

Listing 4-4. The JS File for Checking Dependencies

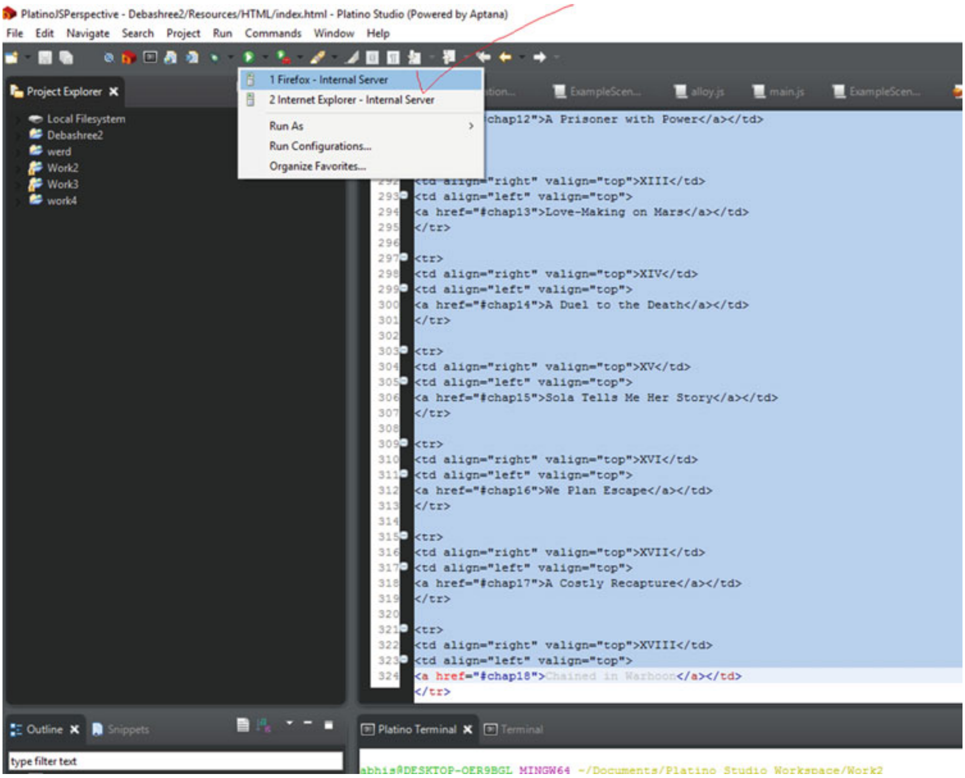
```
/*
 * HTML Application Template:
 * A basic starting point for your application.  Mostly a blank canvas with a web view.
 *
 * In app.js, we generally take care of a few things:
 * - Bootstrap the application with any data we need
 * - Check for dependencies like device type, platform version, or network connection
 * - Require and open our top-level UI component
 *
 */

//bootstrap and check dependencies
if (Ti.version < 1.8 ) {
        alert('Sorry - this application template requires Titanium Mobile SDK 1.8 or
later');
} else {
        //require and open top level UI component
        var ApplicationWindow = require('ui/ApplicationWindow');
        new ApplicationWindow().open();
}
```

The `tiapp.xml` file, shown in Listing 4-5, contains all the definitions for the platform OS as well as external libraries that we are implementing. Any external library should be mentioned here; otherwise, it won't match.

Listing 4-5. The Tiapp.xml File

```
<?xml version="1.0" encoding="UTF-8"?>
<ti:app xmlns:ti="http://ti.appcelerator.org">
    <deployment-targets>
        <target device="mobileweb">true</target>
        <target device="iphone">true</target>
        <target device="ipad">true</target>
        <target device="android">true</target>
        <target device="blackberry">false</target>
    </deployment-targets>
    <sdk-version>4.1.1.GA</sdk-version>
    <id>com.appcelerator.htmltemplate</id>
    <name>HTML Template</name>
    <version>1.0</version>
    <guid>2ABF5A14-E804-4640-ADE9-773A3732ED53</guid>
    <publisher>appcelerator</publisher>
    <url>http://www.appcelerator.com</url>
    <description>not specified</description>
    <copyright>not specified</copyright>
    <icon>appicon.png</icon>
    <persistent-wifi>false</persistent-wifi>
    <prerendered-icon>false</prerendered-icon>
    <statusbar-style>default</statusbar-style>
    <statusbar-hidden>false</statusbar-hidden>
    <fullscreen>false</fullscreen>
    <navbar-hidden>false</navbar-hidden>
    <analytics>true</analytics>
    <iphone>
        <orientations device="iphone">
            <orientation>Ti.UI.PORTRAIT</orientation>
            <orientation>Ti.UI.UPSIDE_PORTRAIT</orientation>
            <orientation>Ti.UI.LANDSCAPE_LEFT</orientation>
            <orientation>Ti.UI.LANDSCAPE_RIGHT</orientation>
        </orientations>
        <orientations device="ipad">
            <orientation>Ti.UI.PORTRAIT</orientation>
            <orientation>Ti.UI.UPSIDE_PORTRAIT</orientation>
            <orientation>Ti.UI.LANDSCAPE_LEFT</orientation>
            <orientation>Ti.UI.LANDSCAPE_RIGHT</orientation>
        </orientations>
    </iphone>
    <android xmlns:android="http://schemas.android.com/apk/res/android"/>
    <modules/>
</ti:app>
```

Let's run the default app on a web browser first. Figure 4-6 shows the app rendered in Mozilla Firefox.


PlatinoJSPerspective - Debashree2/Resources/HTML/index.html - Platino Studio (Powered by Aptana)
File Edit Navigate Search Project Run Commands Window Help
1 Firefox - Internal Server
2 Internet Explorer - Internal Server
Run As
Run Configurations...
Organize Favorites...
Project Explorer
Local Filesystem
Debashree2
werd
Work2
Work3
work4
ExampleScen...
alloy.js
main.js
ExampleScen...
Outline
Snippets
type filter text
Platino Terminal
Terminal

```
chap12">A Prisoner with Power</a></td>

<td align="right" valign="top">XIII</td>
<td align="left" valign="top">
<a href="#chap13">Love-Making on Mars</a></td>
</tr>

<tr>
<td align="right" valign="top">XIV</td>
<td align="left" valign="top">
<a href="#chap14">A Duel to the Death</a></td>
</tr>

<tr>
<td align="right" valign="top">XV</td>
<td align="left" valign="top">
<a href="#chap15">Sola Tells Me Her Story</a></td>
</tr>

<tr>
<td align="right" valign="top">XVI</td>
<td align="left" valign="top">
<a href="#chap16">We Plan Escape</a></td>
</tr>

<tr>
<td align="right" valign="top">XVII</td>
<td align="left" valign="top">
<a href="#chap17">A Costly Recapture</a></td>
</tr>

<tr>
<td align="right" valign="top">XVIII</td>
<td align="left" valign="top">
<a href="#chap18">Chained in Warhoon</a></td>
</tr>
```

```
abhis@DESKTOP-OER9BGL MINGW64 ~/Documents/Platino Studio Workspace/Work2
```

Figure 4-6. *The app rendered in Firefox*

The output of the default app looks like Figure 4-7.

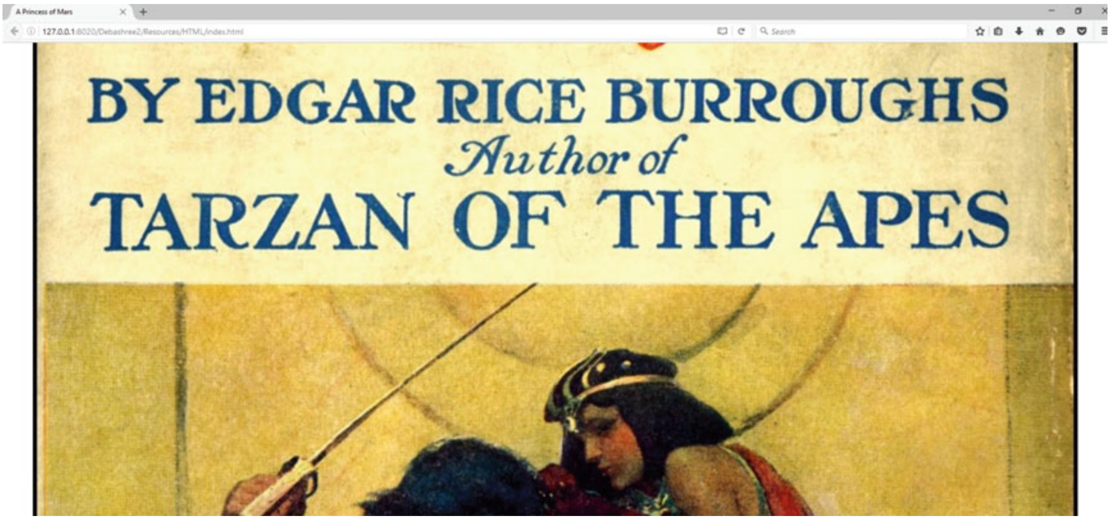
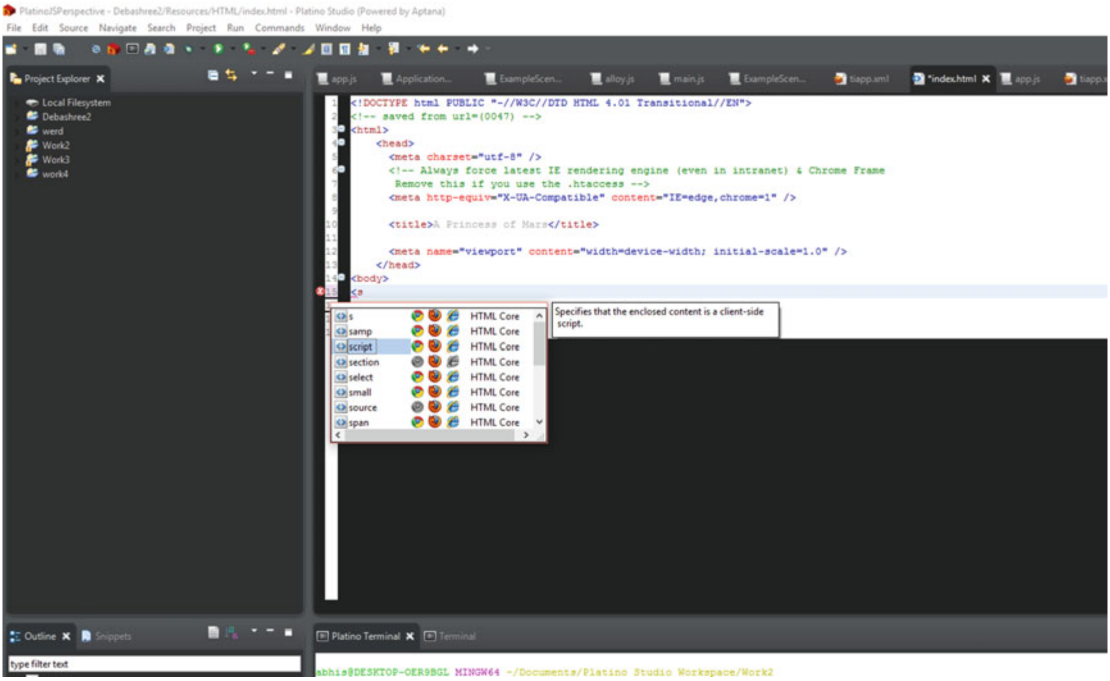


Figure 4-7. The default app

As you make changes, you have to remove the content in the `index.html` page. When you have added the script tag within the HTML page, the Platino editor looks like Figure 4-8.



```
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN">
<!-- saved from url=(0047) -->
<html>
    <head>
      <meta charset="utf-8" />
      <!-- Always force latest IE rendering engine (even in intranet) & Chrome Frame
       Remove this if you use the .htaccess -->
      <meta http-equiv="X-UA-Compatible" content="IE=edge,chrome=1" />

      <title>A Princess of Mars</title>

      <meta name="viewport" content="width=device-width; initial-scale=1.0" />
    </head>
<body>
<s
```

```
s        HTML Core
samp     HTML Core
script   HTML Core
section  HTML Core
select   HTML Core
small    HTML Core
source   HTML Core
span     HTML Core
```

Specifies that the enclosed content is a client-side script.

```
abhis@DESKTOP-OER9BGL MINGW64 ~/Documents/Platino Studio Workspace/Work2
```

Figure 4-8. The script tag within the Platino editor

Now you will create a *Matrix*-like screensaver effect in our default app by making changes inside the `index.html` page. I was just hovering around and with a little bit of tinkering made some changes to the initial code of the open source JavaScript available.

First, take a look at the code in Listing 4-6 and then implement it inside the Platino engine.

Listing 4-6. The 20 Lines of JavaScript for a Matrix-Like Effect

```
<script>
var d=document,a=255/2,el=d.createElement('canvas');
el.width=800;el.height=600;d.body.appendChild(el);
var columns=Array(300).join().split(','),draw=requestAnimationFrame;
var ctx=el.getContext('2d'),random=Math.random,
s=Math.sin,p=parseInt;ctx.translate(el.width, 0);ctx.scale(-1,1);
function getColour(f){
return 'rgb('+[p(s(3*f)*a+a),p(s(3*f+2)*a+a),p(s(3*f+4)*a+a)].join(',')+')';}
// Apparently this algorithm is quite popular out there on the Internet
function fill(now) {
  ctx.fillStyle='rgba(0,0,0,.05)';
  ctx.fillRect(0,0,el.width,el.height);
  ctx.fillStyle=getColour(now);
  columns.map(function(y, index){
    text = String.fromCharCode(12448+random()*96);
    ctx.fillText(text, (index * 10)+10, (y||0));
    columns[index]=(y||0) > 100 + random()*1e4? 0 : y+10;
  });
  draw(fill);
}
draw(fill);

</script>
```

After adding the code and then running the app in Firefox, it looks like Figure 4-9.

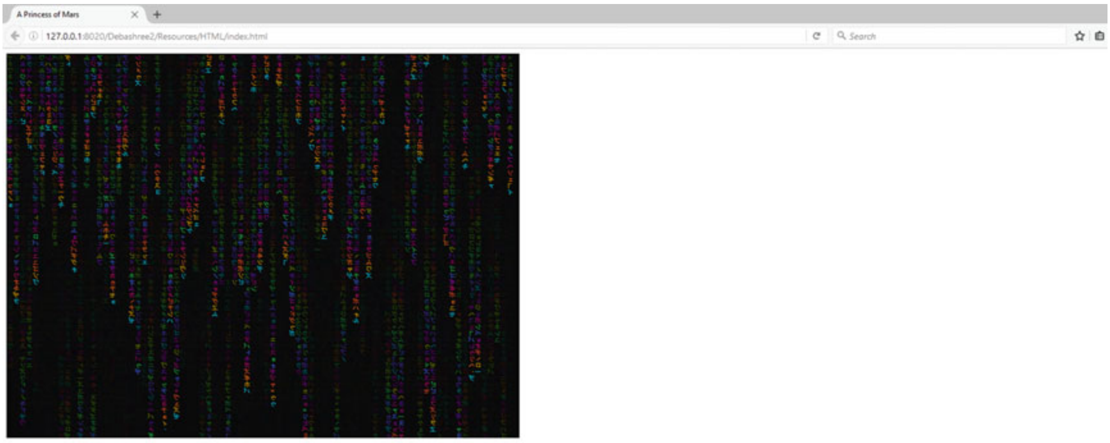


Figure 4-9. *The app producing the effect*

The code works like this: The `create` element creates a canvas element and declares the width and height of the canvas. It then appends a child node. The function `getColour` helps in generating random color to the format and fill (now) generates the effect.

Building a Core Platino App

In this section you will build an app using the core Platino template. Open the Platino game engine, then select a mobile project. Select the Platino template and then click Platino Classic (see Figure 4-10). Name the project, and then you are ready to start. Then click Next.

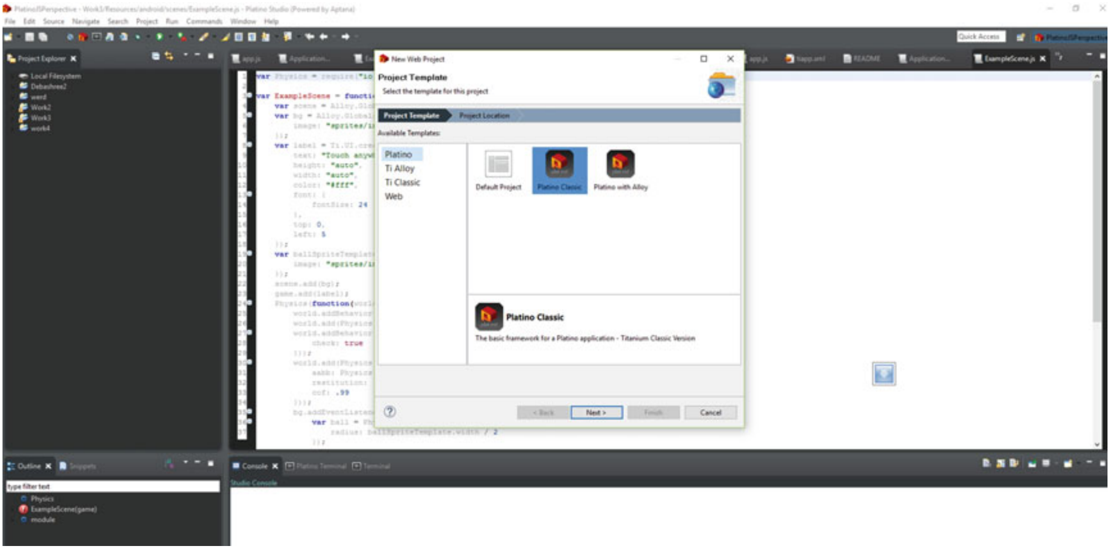
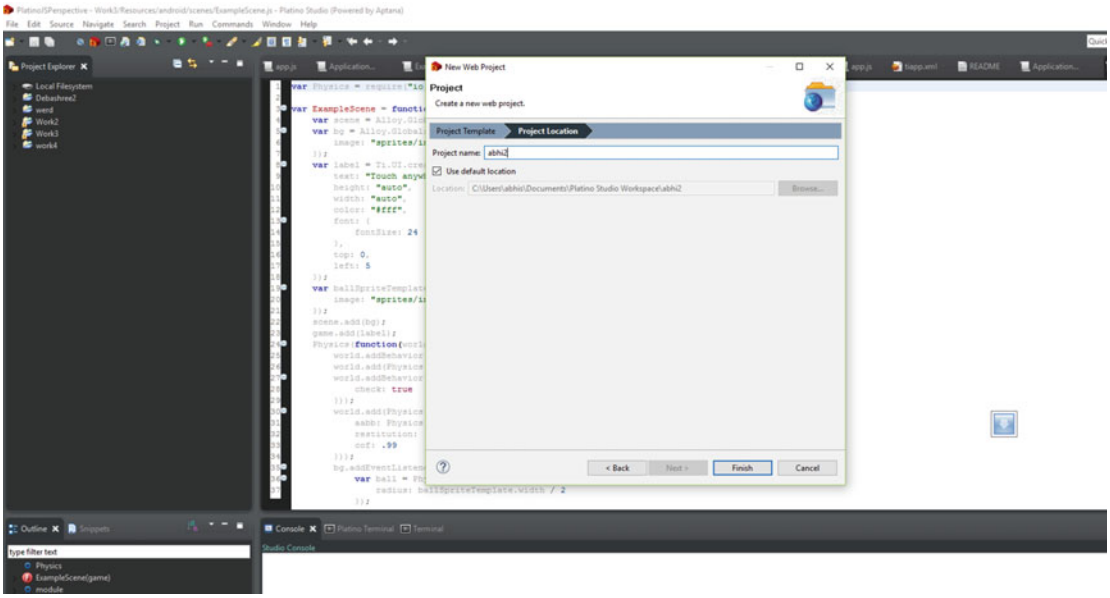


Figure 4-10. *The Platino Classic template*

The project in the example shown in Figure 4-11 is named abhi2. Click Finish.



New Web Project

Project

Create a new web project.

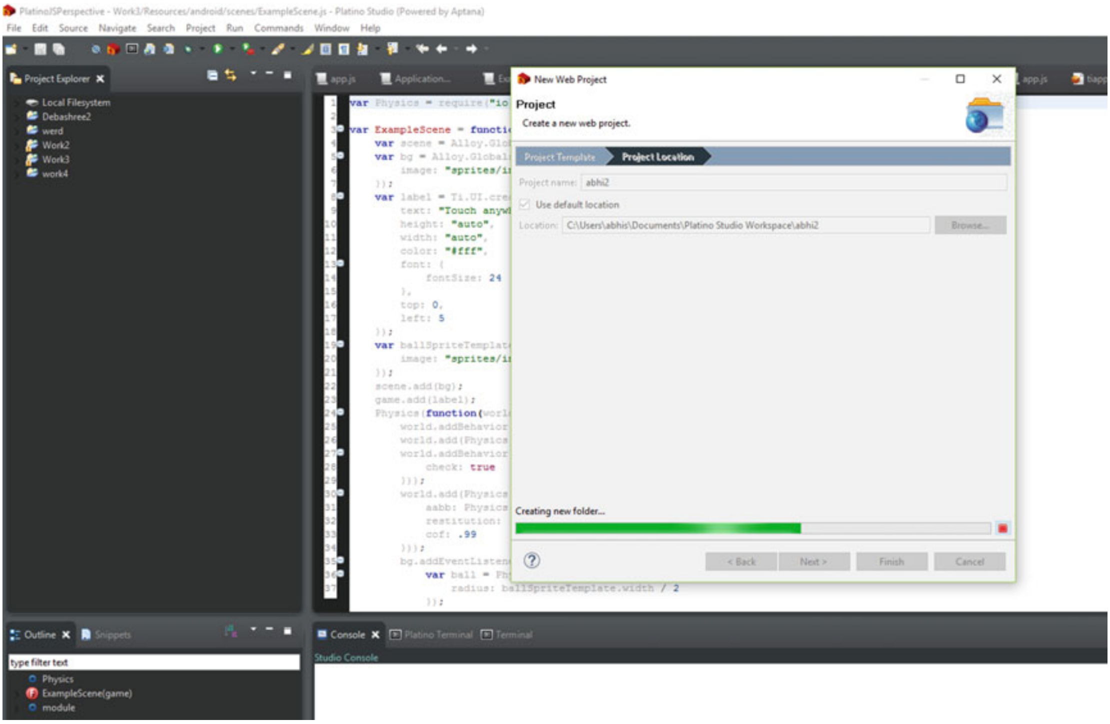
Project name: abhi2

☑ Use default location

Location: C:\Users\abhis\Documents\Platino Studio Workspace\abhi2

Figure 4-11. *Give the project a name*

Platino will go through the steps to create the file structure, as shown in Figure 4-12.



New Web Project

Project

Create a new web project.

Project name: abhi2

☑ Use default location

Location: C:\Users\abhis\Documents\Platino Studio Workspace\abhi2

Creating new folder...

Figure 4-12. *The project creating the necessary files*

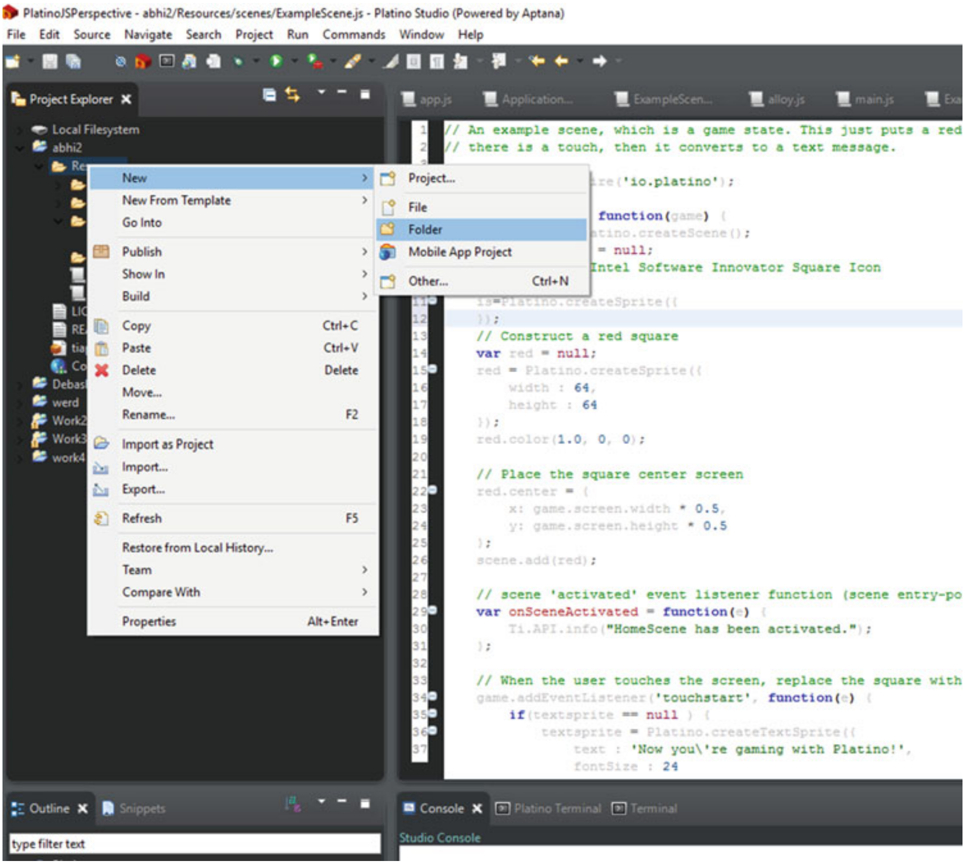
Within the folder structure, you will be targeting the start scene or the main scene of the app.

For this app, you download an Intel Software Innovator logo (Figure 4-13), which you will be using in the app. Being an Intel Software Innovators, we always wanted to include the logo.

Figure 4-13. *The Intel Software Innovator logo*

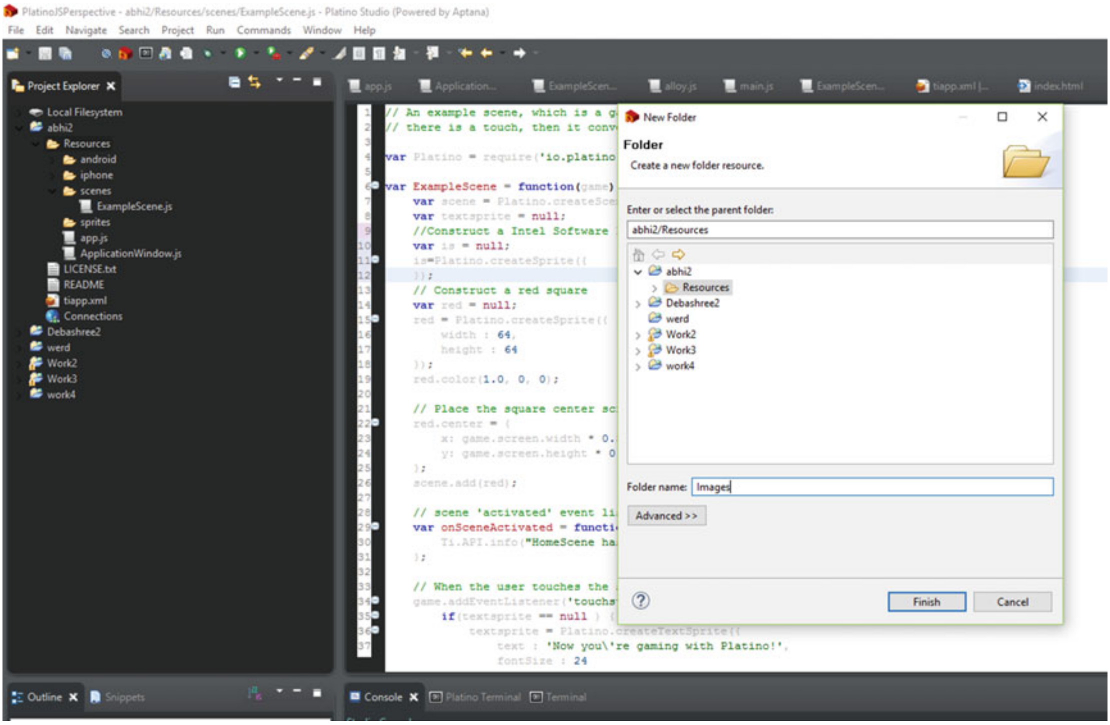
To use Platino, you need to call the module (`'io.platino'`). Remember that with the new Platino Studio, there have been many beneficial changes. When the game view function is launched, its first creates a scene in the game. You declare the scene and then create the entire structure for the app.

You need to create a folder (see Figure 4-14) where you will store the image you downloaded. Name the folder Images (Figure 4-15).



```
// An example scene, which is a game state. This just puts a red
// there is a touch, then it converts to a text message.

                         ire('io.platino');

                          function(game) {
                         atino.createScene();
                          = null;
                         Intel Software Innovator Square Icon

    is=Platino.createSprite({
    });
    // Construct a red square
    var red = null;
    red = Platino.createSprite({
        width : 64,
        height : 64
    });
    red.color(1.0, 0, 0);

    // Place the square center screen
    red.center = {
        x: game.screen.width * 0.5,
        y: game.screen.height * 0.5
    };
    scene.add(red);

    // scene 'activated' event listener function (scene entry-po
    var onSceneActivated = function(e) {
        Ti.API.info("HomeScene has been activated.");
    };

    // When the user touches the screen, replace the square with
    game.addEventListener('touchstart', function(e) {
        if(textsprite == null ) {
            textsprite = Platino.createTextSprite({
                text : 'Now you\'re gaming with Platino!',
                fontSize : 24
```

Figure 4-14. *Creating a folder for storing images*



```
// An example scene, which is a g
// there is a touch, then it conv

var Platino = require('io.platino

var ExampleScene = function(game)
    var scene = Platino.createSce
    var textsprite = null;
    //Construct a Intel Software
    var is = null;
    is=Platino.createSprite({
    });
    // Construct a red square
    var red = null;
    red = Platino.createSprite({
        width : 64,
        height : 64
    });
    red.color(1.0, 0, 0);

    // Place the square center sc
    red.center = {
        x: game.screen.width * 0.
        y: game.screen.height * 0
    };
    scene.add(red);

    // scene 'activated' event li
    var onSceneActivated = functi
        Ti.API.info("HomeScene ha
    };

    // When the user touches the
    game.addEventListener('touchs
        if(textsprite == null ) {
            textsprite = Platino.createTextSprite({
                text : 'Now you\'re gaming with Platino!',
                fontSize : 24
```

New Folder

Folder

Create a new folder resource.

Enter or select the parent folder: abhi2/Resources

Folder name: Images

Figure 4-15. *Naming the folder you created*

Let's get the extra details of the app that we want to implement. You scale the Intel Software Innovator image to the center of the screen. Declare the sprite as `is` and use the `create sprite` method. Next, declare the path of the image and the size and width of it. Declare both as 100, then center the Intel Software Innovator icon and add the scene for rendering. The next logic is triggered when the user touches the screen: The logo disappears and a text message is shown. For this text message we have used text sprite. Let's take a look at the code, shown in Listing 4-7.

Listing 4-7. The Code for the App

```
// An example scene, which is a game state. This just puts the Intel Software Innovator
graphic on the screen until
// there is a touch, then it converts to a text message.

var Platino = require('io.platino');

var ExampleScene = function(game) {
        var scene = Platino.createScene();
        var textsprite = null;
        //Construct a Intel Software Innovator Square Icon
        var is = null;
        is=Platino.createSprite({
```

```
        image:"Images/is.jpg",
        width : 100,
                height : 100

        });

        //Place Intel Software Innovator logo to center of the scene
        is.center = {
                x: game.screen.width * 0.5,
                y: game.screen.height * 0.5
        };Core Platino APPcode for app
        scene.add(is);

        // scene 'activated' event listener function (scene entry-point)
        var onSceneActivated = function(e) {
                Ti.API.info("HomeScene has been activated.");
        };

        // When the user touches the screen, replace the logo  with a message
        game.addEventListener('touchstart', function(e) {
                if(textsprite == null ) {
                        textsprite = Platino.createTextSprite({
                                text : 'Now you\'re gaming with Platino!',
                                fontSize : 24
                        });
                        textsprite.color(1.0, 1.0, 1.0);
                        textsprite.center = {
                                x: game.screen.width * 0.5,
                                y: game.screen.height * 0.5
                        };
                        scene.remove(is);
                        scene.add(textsprite);
                }
        });

        // scene 'deactivated' event listener function (scene exit-point)
        var onSceneDeactivated = function(e) {
                Ti.API.info("HomeScene has been deactivated.");
        };

        // Scene activation events here
        scene.addEventListener('activated', onSceneActivated);
        scene.addEventListener('deactivated', onSceneDeactivated);

        return scene;
}

module.exports = ExampleScene;
```

For the next app we build, you will be using the Alloy and Platino with Physics JS. To start with, let us see what Physics JS does.

Physics JS

Physics JS (Figure 4-16) is a very easy-to-use, flexible physics engine for JavaScript with many capabilities.

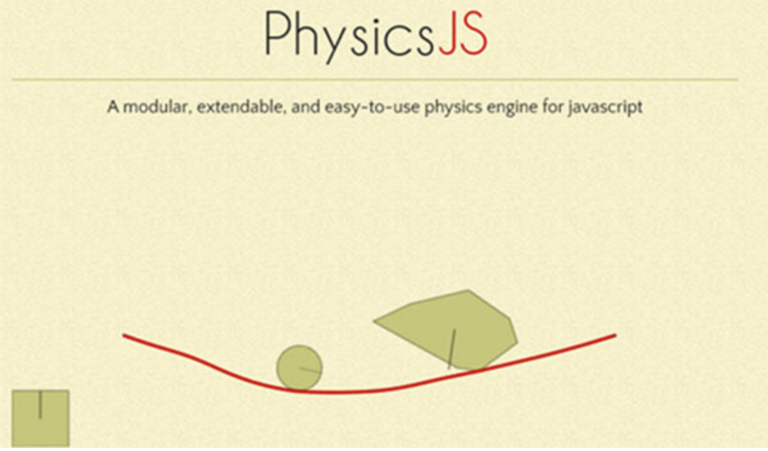
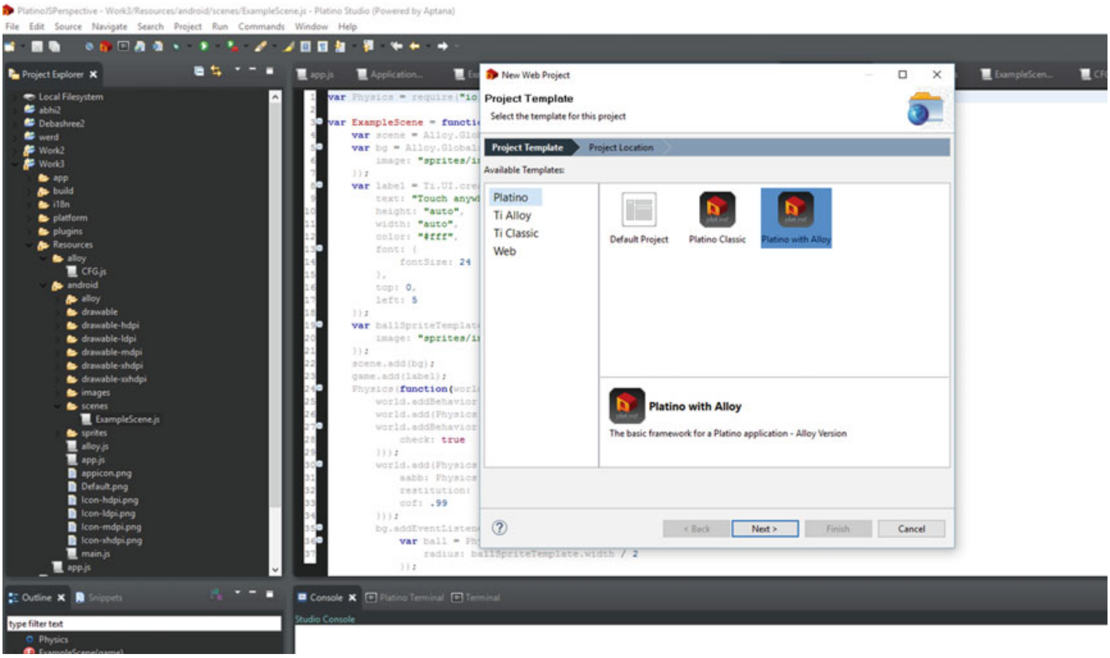

PhysicsJS
A modular, extendable, and easy-to-use physics engine for javascript

***Figure 4-16.** Physics JS*

Let’s start the project template now. Choose the Platino with Alloy template as shown in Figure 4-17. Click Next and name the project abhi4.



```
var Physics = require("io
var ExampleScene = functi
    var scene = Alloy.Glo
    var bg = Alloy.Global
        image: "sprites/i
    });
    var label = Ti.UI.cre
        text: "Touch anyw
        height: "auto",
        width: "auto",
        color: "#fff",
        font: {
            fontSize: 24
        },
        top: 0,
        left: 5
    });
    var ballSpriteTemplat
        image: "sprites/i
    });
    scene.add(bg);
    game.add(label);
    Physics(function(worl
        world.addBehavior
        world.add(Physics
        world.addBehavior
            check: true
        }));
        world.add(Physics
            aabb: Physics
            restitution:
            cof: .99
        }));
        bg.addEventListen
            var ball = Ph
                radius: ballSpriteTemplate.width / 2
            });
```

New Web Project

Project Template

Select the template for this project

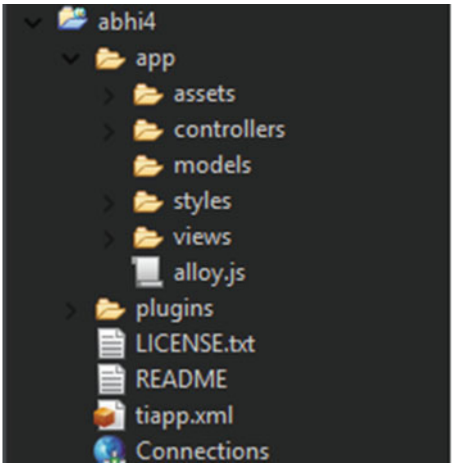
Available Templates:

Platino with Alloy

The basic framework for a Platino application - Alloy Version

***Figure 4-17.** Including the Platino with Alloy template*

Figure 4-18 provides a look at the folder structure.



```
abhi4
  app
    assets
    controllers
    models
    styles
    views
    alloy.js
  plugins
  LICENSE.txt
  README
  tiapp.xml
  Connections
```

Figure 4-18. *Project folder structure*

Okay

The app that we created has a different folder structure than the previous apps we created to this point. The folder structure and the details are given below.

- Assets
- Controllers
- Models
- Styles
- Views
- Alloy.js
- Plugins
- The other file structures are the same.

Assets

The Assets folder contains all the important files for structuring the app. It also contains details for targeting different versions. The important subfolder within the Assets folder is the Scene folder, where you write the logic for how the scene looks and, if required, to perform transitions from one scene to other. Within the sprites we keep the sprite sheets in place. The main JavaScript file contains the scene setup and the general game flow. The file looks like Listing 4-8.

Listing 4-8. The `main.js` File

```
// Start place of your application. Generally used for control of the scene setup and
general game flow.

// Create and set up the game
var game = Alloy.Globals.Platino.createGameView();
game.fps = 30;
game.color(0, 0, 0);
game.debug = false; // disables debug logs (not to be used for production)
game.enableOnDrawFrameEvent = false; // optimization: setting to 'false' disables
'enterframe' event
game.screen = {width: 480, height: 320};

// Load the scene and start the game
game.addEventListener('onload', function(e) {
        var scene = require("scenes/ExampleScene");
        game.pushScene(new scene(game));
        game.start();
});
Module.exports = game;
```

The `Controllers` folder contains two files: `index.js` and `window.js`. The `index.js` file, shown in Listing 4-9, redirects to the window controller for better naming conventions.

Listing 4-9. The `index.js` File

```
// Redirect to the window controller for better naming conventions
var window = Alloy.createController('window').getView();
window.open();
```

The `window.js` file contains the logic that imports the main file (see Listing 4-10), which must return a game object.

Listing 4-10. The `main.js` File

```
// Import the main file, which must return a game object. This is simply added to our window
and we start.
// The window can be set up in window.tss

var game = require('main');
$.win.add(game);
$.win.open();

// Free up game resources when window is closed
$.win.addEventListener('close', function(e) {
        game = null;
});
```

The next important file in the structure is the `alloy.js` file, shown in Listing 4-11, which binds the Platino API.

Listing 4-11. The Content of the `alloy.js` File

```
// The Platino API can be accessed via Alloy.Globals.Platino from any controller file. This
makes it an automatic
// include. If you want to create other globals, the Alloy.Globals namespace is meant for
just that.

Alloy.Globals.Platino = require('io.platino');
```

Figure 4-19. *The Platino background screen*

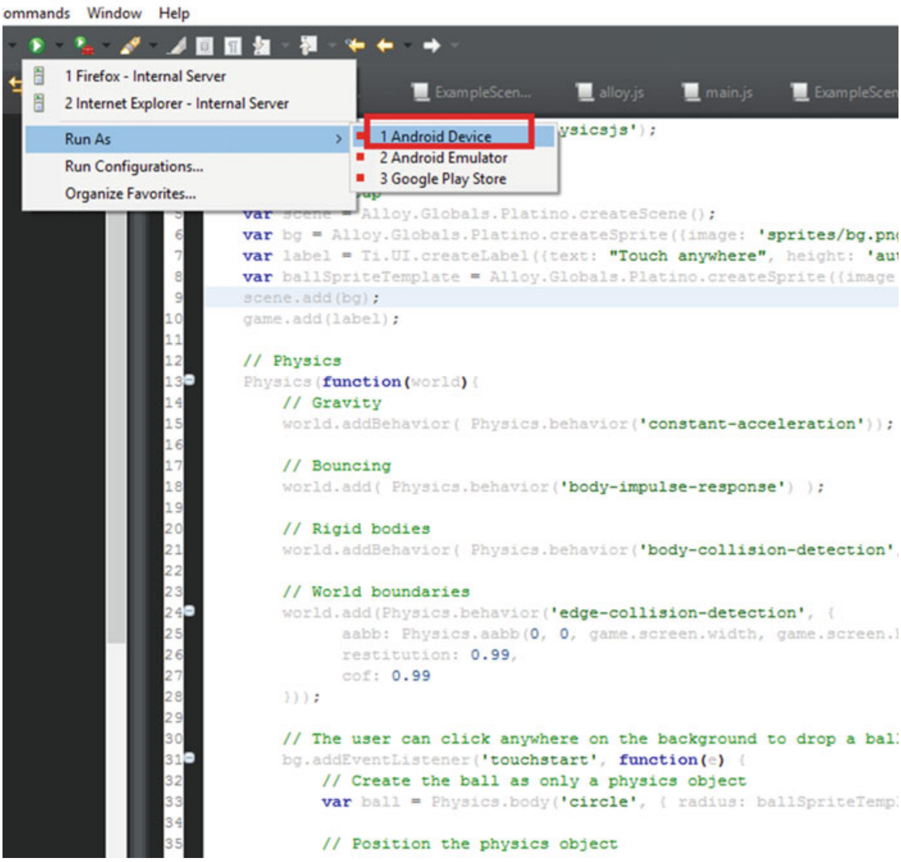
The demo that we are working on right now will first show the Intel Software Innovator logo. When we touch the screen, the logo overlaps with the background of Platino and gives the count. We will be using the

Platino background logo shown in Figure 4-19 for the app.

First you need to add Physics JS inside the `Tiapp.xml` so you can use Physics JS within Platino (see Listing 4-12).

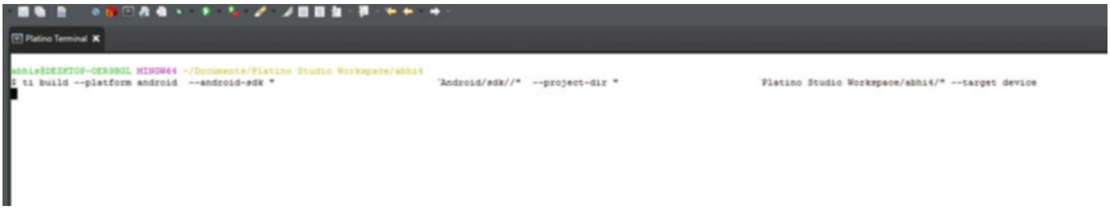
Listing 4-12. The Code for the Game

```
var Physics = require('io.platino.physicsjs');

var ExampleScene = function(game) {
        // Scene setup
        var scene = Alloy.Globals.Platino.createScene();
        var bg = Alloy.Globals.Platino.createSprite({image: 'sprites/bg.png'});
        var label = Ti.UI.createLabel({text: "Touch anywhere", height: 'auto', width:
        'auto', color:'#fff', font:{fontSize:24}, top: 0, left: 5});
        var ballSpriteTemplate = Alloy.Globals.Platino.createSprite({image: 'sprites/1.
        png'}); // For knowing its size
        scene.add(bg);
        game.add(label);

        // Physics
          Physics(function(world){
                // Gravity
                world.addBehavior( Physics.behavior('constant-acceleration'));

                // Bouncing
                world.add( Physics.behavior('body-impulse-response') );

                // Rigid bodies
                world.addBehavior( Physics.behavior('body-collision-detection',
                {check:true}));

                // World boundaries
                world.add(Physics.behavior('edge-collision-detection', {
                      aabb: Physics.aabb(0, 0, game.screen.width, game.screen.height),
                      restitution: 0.99,
                      cof: 0.99
                }));

                // The user can click anywhere on the background to drop a ball
                bg.addEventListener('touchstart', function(e) {
                        // Create the ball as only a physics object
                        var ball = Physics.body('circle', { radius: ballSpriteTemplate.width
                        / 2 });

                        // Position the physics object
                        ball.state.pos.x = e.x;
                        ball.state.pos.y = e.y;

                        // Make sure the world acts upon the ball
                        world.add(ball);

                        // Set the label to balls total
                        label.text = "Total Intel Software Innovator logos: " + world.
                        getBodies().length;

                        // Associate a platino sprite with the physics body
                        ball.sprite = Alloy.Globals.Platino.createSprite({image: 'sprites/1.
                        png', centerX: e.x, centerY: e.y});
                        scene.add(ball.sprite);
                });

                // Once per frame, step the world and apply each physics object's position
                to its referenced sprite
                game.addEventListener('enterframe', function(e) {
                        world.stepDelta(e.delta);
                });
        });
```



```
ysicsjs');

var scene = Alloy.Globals.Platino.createScene();
var bg = Alloy.Globals.Platino.createSprite({image: 'sprites/bg.pn
var label = Ti.UI.createLabel({text: "Touch anywhere", height: 'au
var ballSpriteTemplate = Alloy.Globals.Platino.createSprite({image
scene.add(bg);
game.add(label);

// Physics
Physics(function(world){
    // Gravity
    world.addBehavior( Physics.behavior('constant-acceleration'));

    // Bouncing
    world.add( Physics.behavior('body-impulse-response') );

    // Rigid bodies
    world.addBehavior( Physics.behavior('body-collision-detection',

    // World boundaries
    world.add(Physics.behavior('edge-collision-detection', {
        aabb: Physics.aabb(0, 0, game.screen.width, game.screen.
        restitution: 0.99,
        cof: 0.99
    }));

    // The user can click anywhere on the background to drop a bal
    bg.addEventListener('touchstart', function(e) {
        // Create the ball as only a physics object
        var ball = Physics.body('circle', { radius: ballSpriteTemp

        // Position the physics object
```

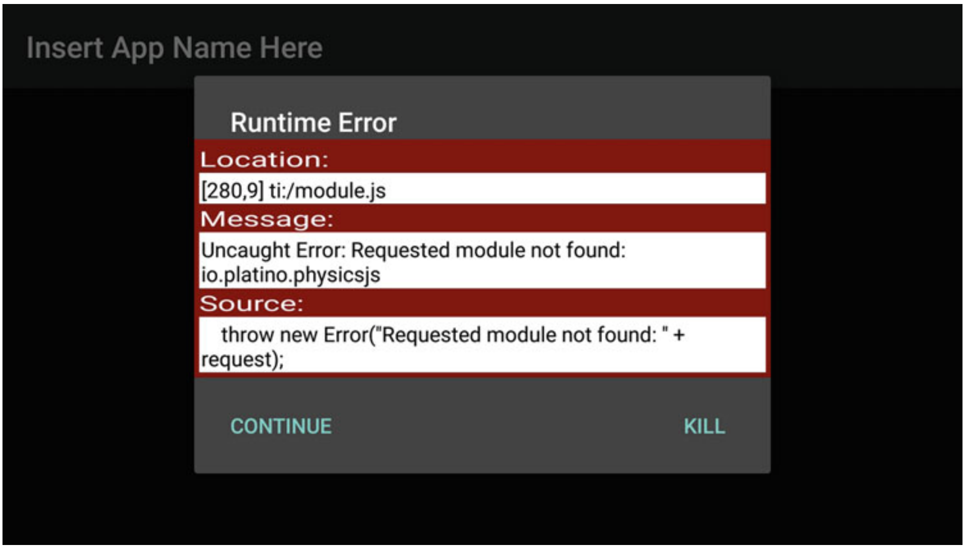
Figure 4-20. Compiling for Android



```
abhis@DESKTOP-OER9BGL MINGW64 ~/Documents/Platino Studio Workspace/abhi4
$ ti build --platform android  --android-sdk "                    Android/sdk//"  --project-dir "                    Platino Studio Workspace/abhi4/" --target device
```

Figure 4-21. *Series of steps for compiling the project*

```
        return scene;
};
```



Location:
[280,9] ti:/module.js
Message:
Uncaught Error: Requested module not found: io.platino.physicsjs
Source:

```
    throw new Error("Requested module not found: " + request);
```

Figure 4-22. *Runtime error*

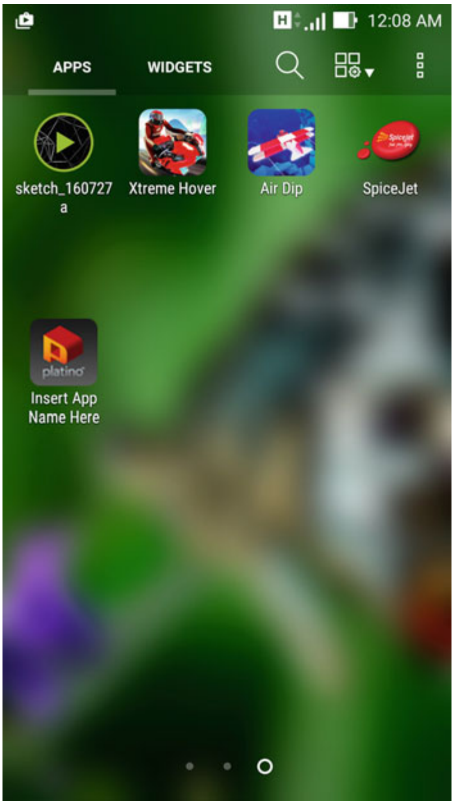


Figure 4-23. *The app as it is shown on a mobile device*

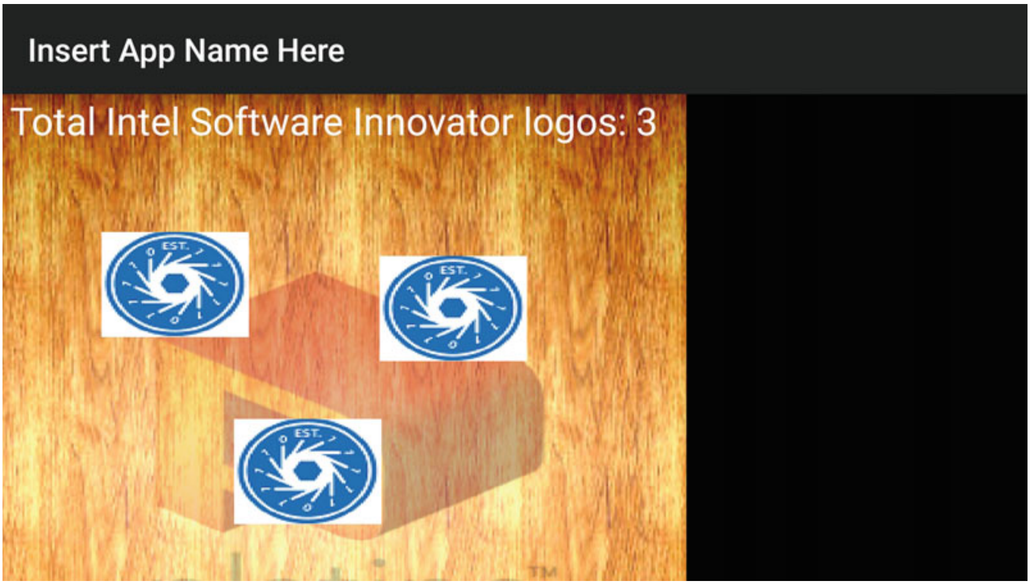


Figure 4-24. *The app running on a mobile device*

```
module.exports = ExampleScene;
```

Now let us compile the project for an Android build. Attach your Android phone with debugging mode on, and then open Platino Studio. Click Run As, then select Android Device, as shown in Figure 4-20.

The compilation process will go through steps, as shown in Figure 4-21.

When the compilation is complete, you will see the app runs on the device. If there is an exception, you will get an error message both on the phone as well as the integrated development environment (IDE). The error might occur because we haven't added the Physics JS module as shown in Figure 4-22 in runtime.

The app when installed on a phone looks like Figure 4-23.

When it is running properly, the app looks something like Figure 4-24.

In this chapter, you have seen some simple use cases of the Platino engine. You can take it further by adding more functionalities to the app.

Summary

In this chapter we have shown how to develop apps with Platino Studio. We have shown the templates and how you can take advantage of them. We have also shown how to implement Physics JS within the module.

CHAPTER 5

Creative Coding and Processing

In Chapter 4, we went through the process for developing games with the Platino game engine. You have seen how we use the game engine features to work in different interactive ways in a game engine. We move ahead in this chapter and introduce creative coding.

Creative Coding and Processing

In this chapter, we start with creative coding. We first define the term and then move ahead with different frameworks for creative coding. We next focus on the creative coding language we are going to cover, Processing. We provide an introduction to Processing and show how the language has evolved, detail support for different platforms, and cover installing Processing in Windows.

The following topics are covered in this chapter:

- Creative coding and different frameworks.
- Processing language.
- Different platform support and installation on Windows.
- We demonstrate with examples and build it for Android.

What Is Creative Coding?

Creative coding, as the name suggests, is an unusual way of representing our code. It is the combination of arts with code. Creative coding helps us in several ways. The styles are as follows:

- Art installations in Billboards.
- Projection mapping.
- Special installation through interactive gestures.

Art Installations

Art installations are representations using 3D visualizing techniques and creative coding as the programming base (see Figure 5-1). The programming language generally used in art installations is Processing (which we introduce later). Art installation changes the perception of free space with projects brought about by creative coding. Art installations can be temporary or permanent. Some art installations that are permanent can be 3D printed after we have coded them with creative coding techniques.

A. Nandy and D. Chanda, *Beginning Platino Game Engine*, DOI 10.1007/978-1-4842-2484-7_5

Figure 5-1. *Art installations*

Projection Mapping

Projection mapping is a technique with which we turn an everyday object, say a wall or a building, into a surface that displays different visualizations with an awesome effect.

The general structure of projection mapping is shown in Figure 5-2.

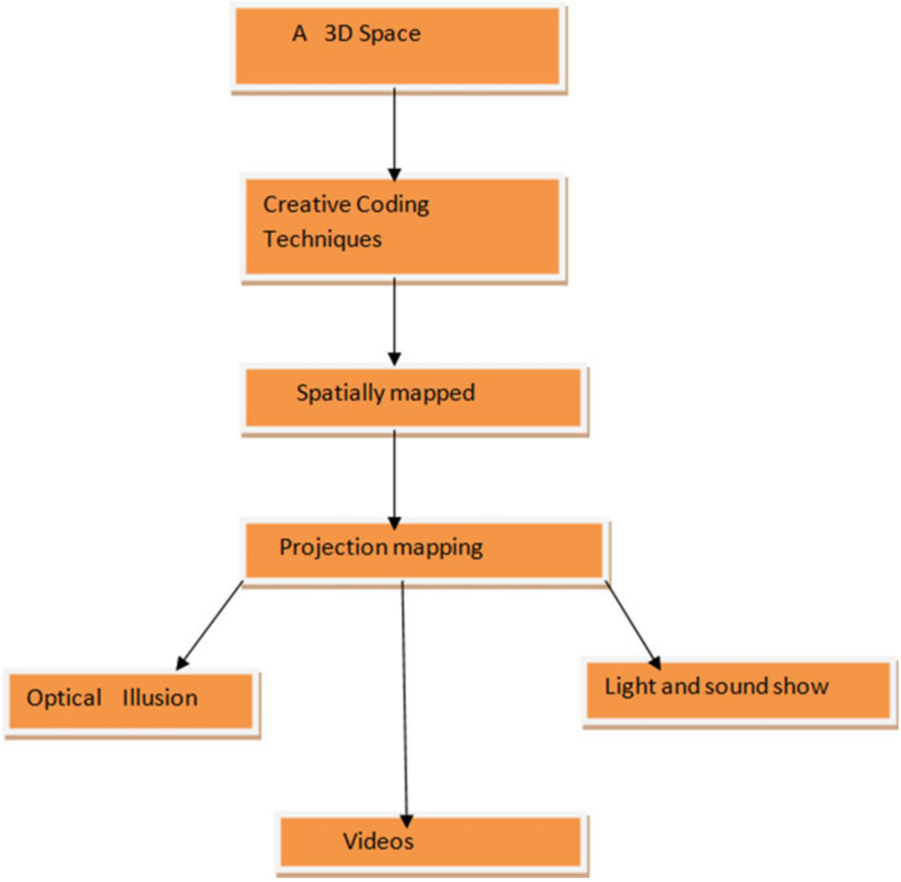


Figure 5-2. *Projection mapping flow*

A 3D Space

A 3D space can be a wall or a building where we set up our projection tools and then analyze the space on which we will perform the projection. This 3D space acts as carrier for producing the effect. Figure 5-3 shows how a corridor of 3D space has been transformed by a sparkling art installation effect.

Figure 5-3. *Creative coding installations*

Creative Coding Techniques

Now, before we project visual arts and representations across a wall or building (see Figures 5-4 and 5-5), we first must to find out which programming languages we need to work with to get our task done. We cover the options, and then you have to choose which programming language suits your work best.

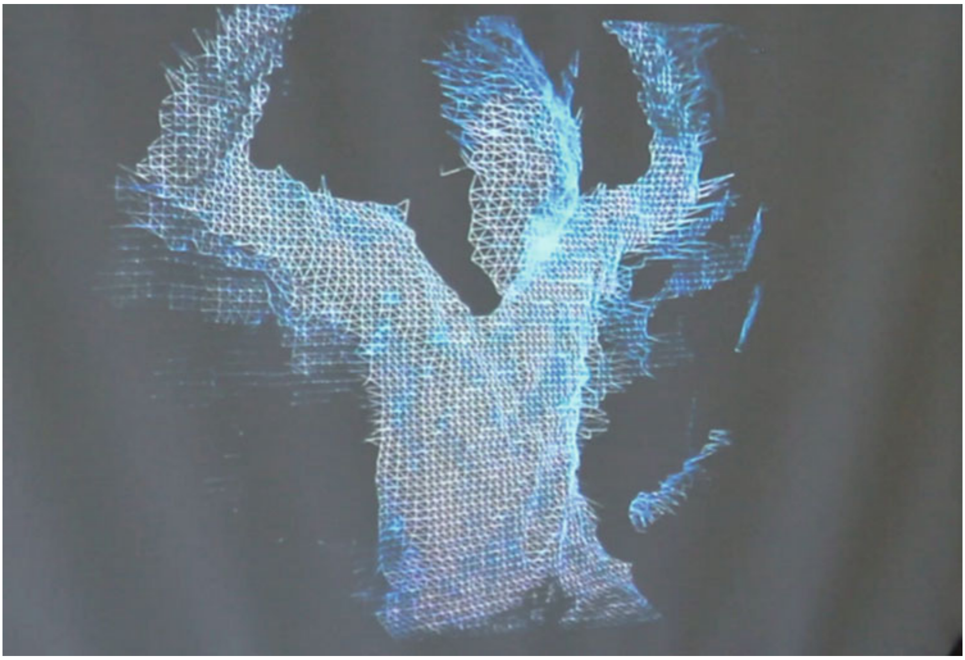


Figure 5-4. *Unique styling effect*

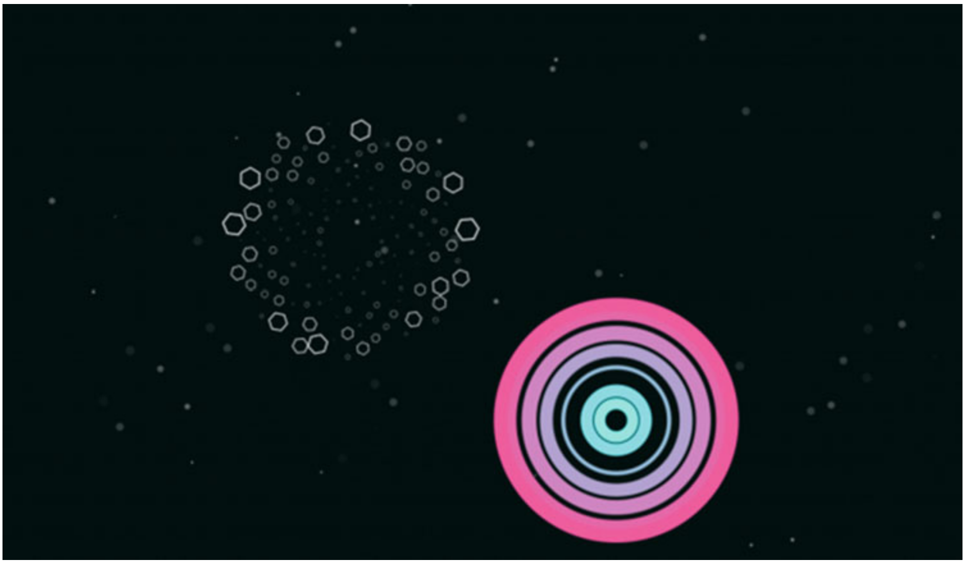


Figure 5-5. *Creative coding patterns*

Spatial Mapping

As you can see, according to the space, you can create projections suitable for a particular geometric body or bodies within the frame to be applied. This projection is made easy using algorithms that identify the geometric body, and mapping helps the creative programming language to produce the desired effect. Projection generally happens with powerful 3D projectors and uses cameras that support 3D scanning, which helps in getting things in order.

Figure 5-6 shows spatial mapping in Hololens.

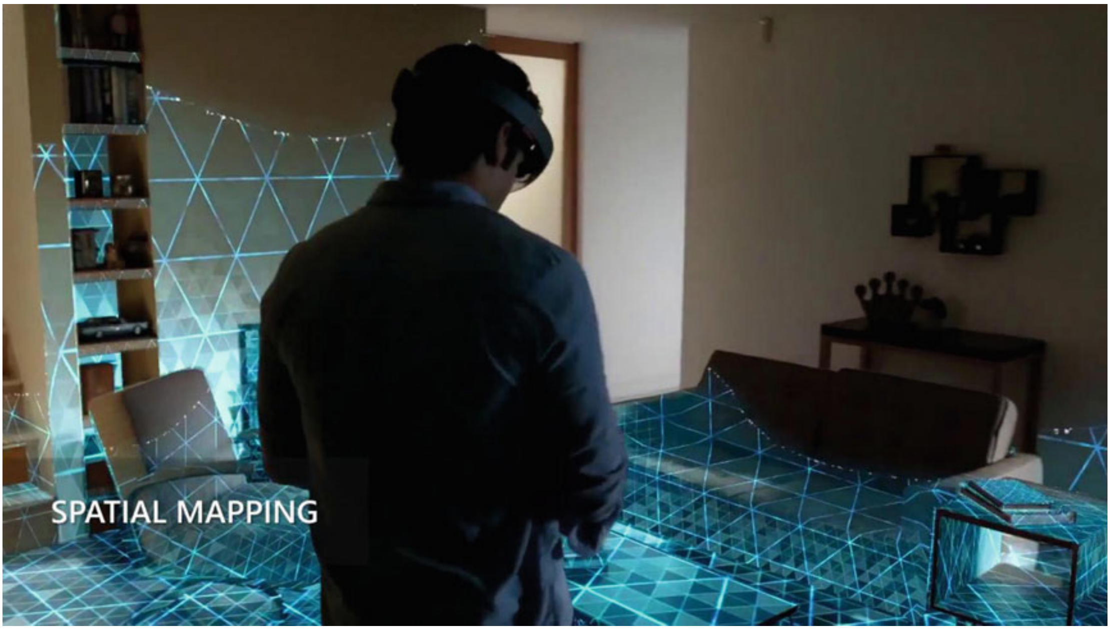


Figure 5-6. *Spatial mapping using Hololens*

Projection Mapping

Now with everything in place, you have to perform the projection with all the things just discussed to produce a stunning effect. The virtual art piece is very engaging, and can also be triggered by voice or gestures. Figure 5-7 shows an amazing art effect at the Sydney Opera House.

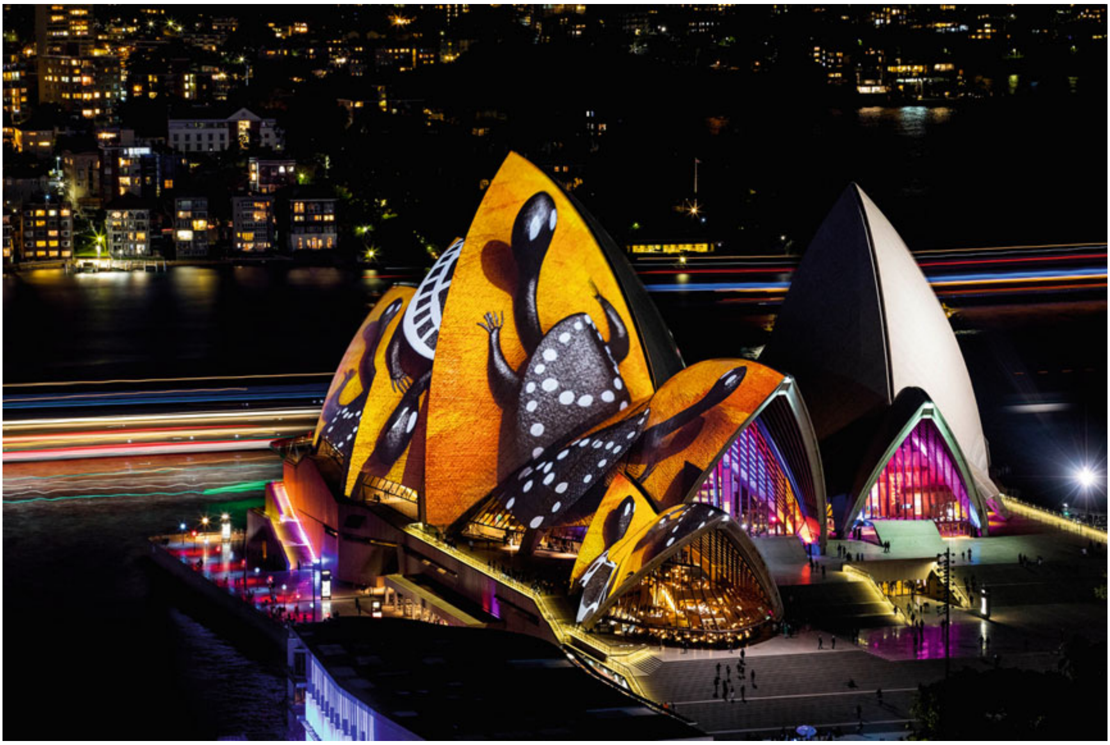


Figure 5-7. *Amazing art installations at the Sydney Opera House*

Examples of Projection Mapping

As we create different projection mapping patterns, there are different variants of them, such as optical illusion, videos, and light and sound shows.

Sketching to Reality

In science fiction movies, we see a lot of objects and scenarios that are very eye-catching and very extraordinary. Creative coding helps us bring those ideas to life. For example, Conway's game of life, displayed in Figure 5-8, can be brought into life with the help of creative coding.

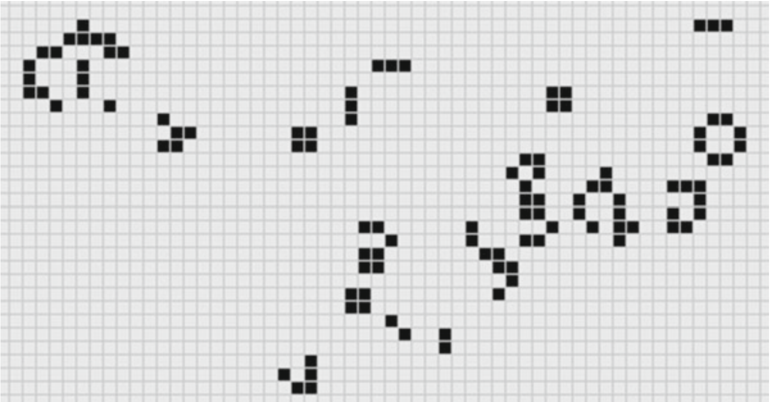


Figure 5-8. *Conway's game of life*

This is an algorithm proposed by John Horton Conway based on cellular automata to give an overview of how the biological functionalities of life occur. This is a perfect simulation that happens in a 2D grid and provides a very close to life-like effect.

As things get more intriguing, we now introduce you to different frameworks.

Different Frameworks

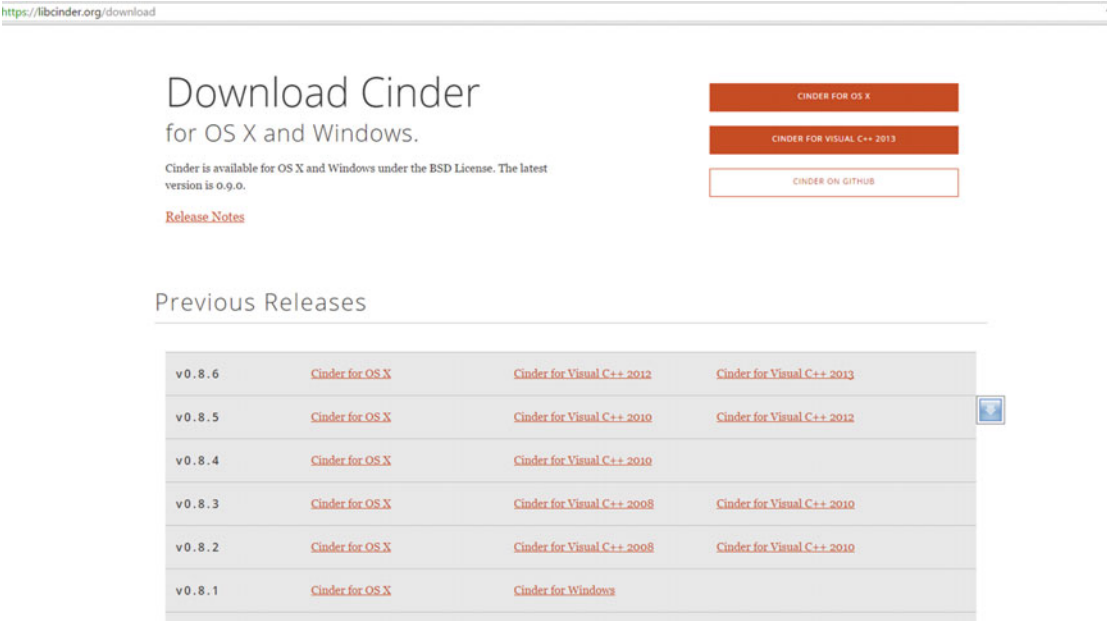
In this section we introduce you to different creative coding frameworks that are very useful in creative coding.

Cinder

Cinder (Figure 5-9) is a creative coding framework specially meant for C++. The best way to keep updated with Cinder is through a combination of Cinder and GIT. In this case, you will always get updates very easily. The platform support for Cinder is Windows and OSX.

Figure 5-9. *Cinder logo*

You can download Cinder from `https://libcinder.org/download`, as depicted in Figure 5-10.



Download Cinder

for OS X and Windows.

Cinder is available for OS X and Windows under the BSD License. The latest version is 0.9.0.

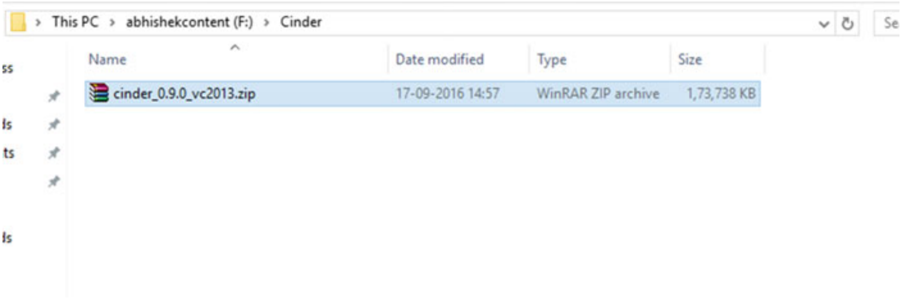
Release Notes

Previous Releases

v0.8.6	Cinder for OS X	Cinder for Visual C++ 2012	Cinder for Visual C++ 2013
v0.8.5	Cinder for OS X	Cinder for Visual C++ 2010	Cinder for Visual C++ 2012
v0.8.4	Cinder for OS X	Cinder for Visual C++ 2010	
v0.8.3	Cinder for OS X	Cinder for Visual C++ 2008	Cinder for Visual C++ 2010
v0.8.2	Cinder for OS X	Cinder for Visual C++ 2008	Cinder for Visual C++ 2010
v0.8.1	Cinder for OS X	Cinder for Windows	

Figure 5-10. *Downloading Cinder*

When you download Cinder, it generally comes in the form of a zip file, which is displayed in Figure 5-11.



Name	Date modified	Type	Size
cinder_0.9.0_vc2013.zip	17-09-2016 14:57	WinRAR ZIP archive	1,73,738 KB

Figure 5-11. *The zip file for Cinder*

Some helpful tools are available for Cinder that allow us to add additional libraries into the package. These different tools are shown in Figure 5-12.

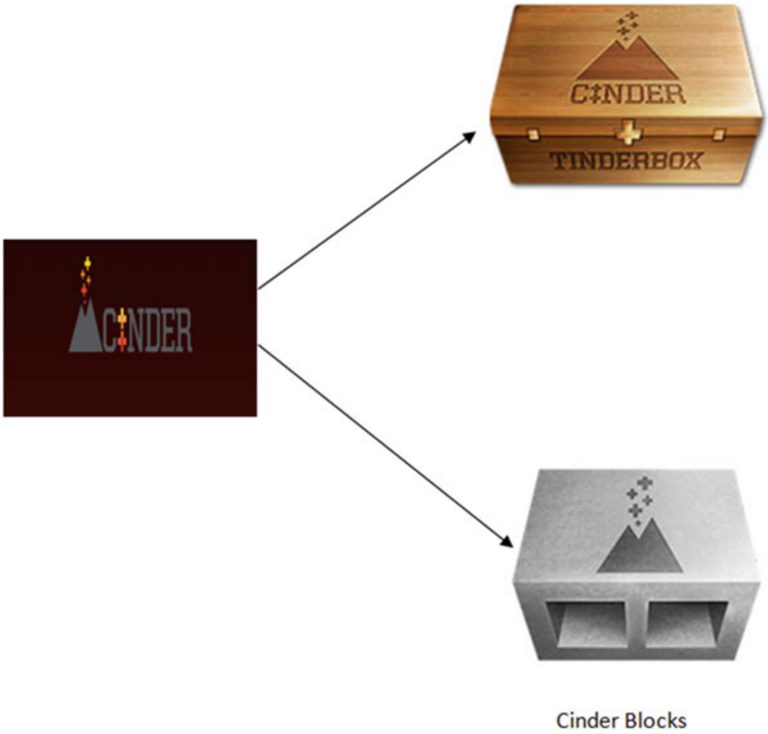


Figure 5-12. *Cinder tools for adding libraries*

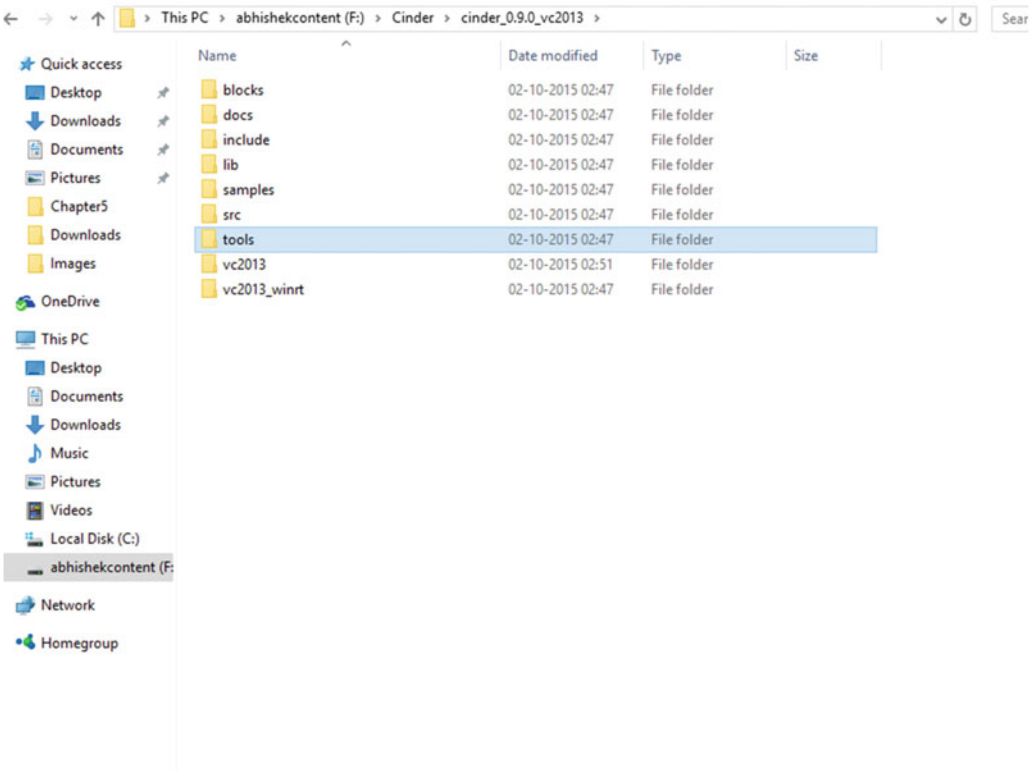
Tinderbox

Tinderbox is a tool that is designed to create a simplified structure for creating new projects. It can create both Visual Studio and Xcode projects and also integrate CinderBlocks.

CinderBlocks

CinderBlocks is a prepackaged collection of libraries and code that allows for third-party libraries.

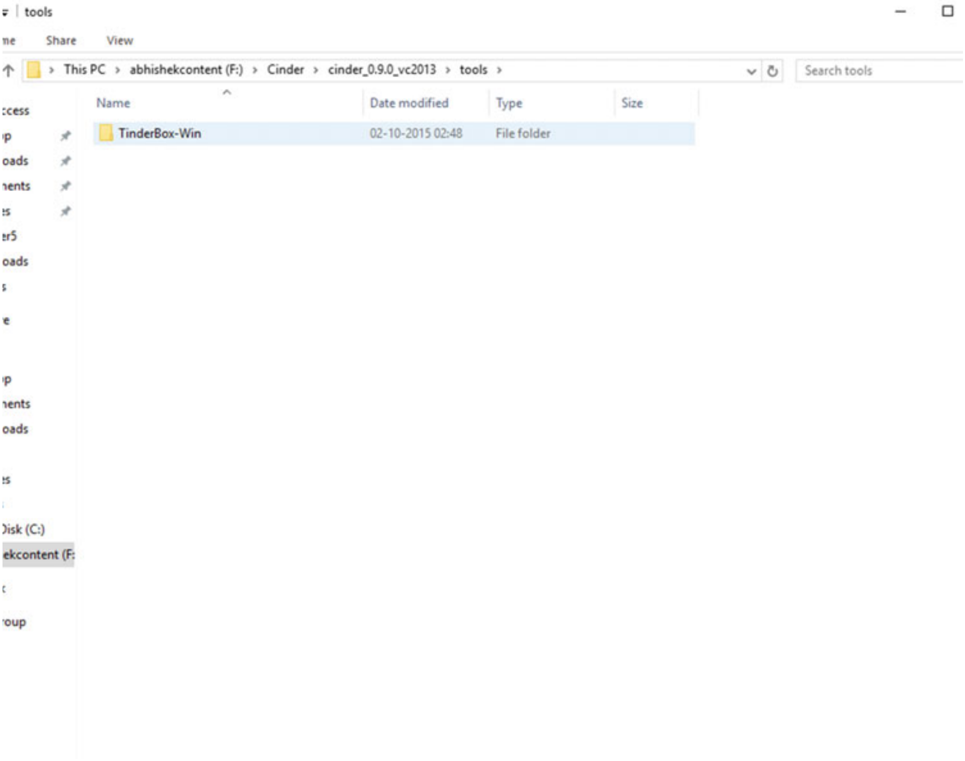
Let's cover how to get started with CinderBlocks. Navigate to the Cinder folder and find the Tools folder, as shown in Figure 5-13.



Name	Date modified	Type	Size
blocks	02-10-2015 02:47	File folder	
docs	02-10-2015 02:47	File folder	
include	02-10-2015 02:47	File folder	
lib	02-10-2015 02:47	File folder	
samples	02-10-2015 02:47	File folder	
src	02-10-2015 02:47	File folder	
tools	02-10-2015 02:47	File folder	
vc2013	02-10-2015 02:51	File folder	
vc2013_winrt	02-10-2015 02:47	File folder	

Figure 5-13. *The Tools subfolder within the Cinder main folder*

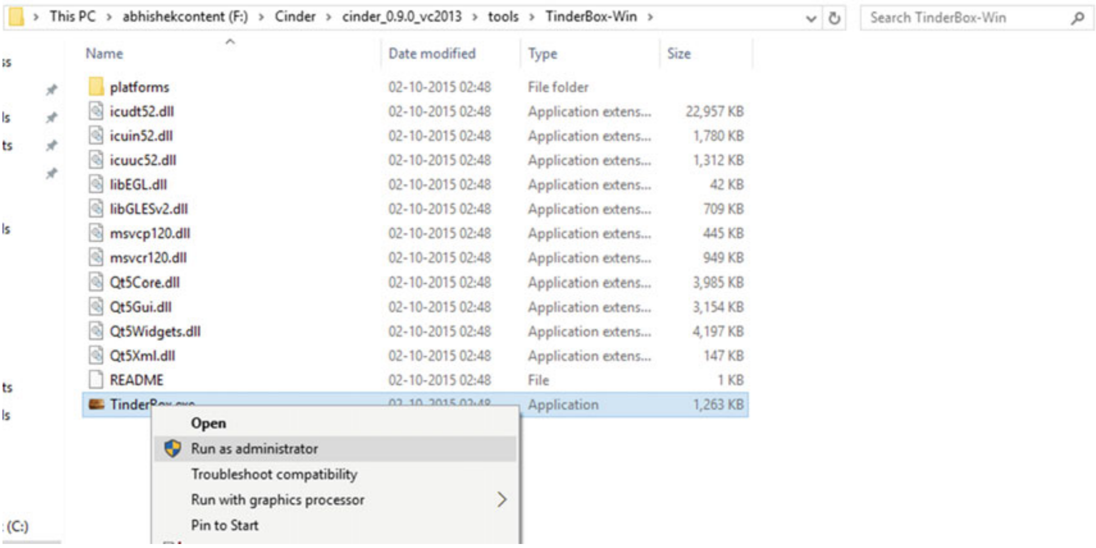
Open the Tools folder to find the TinderBox-Win folder, seen in Figure 5-14.



Name	Date modified	Type	Size
TinderBox-Win	02-10-2015 02:48	File folder	

Figure 5-14. The TinderBox-Win folder

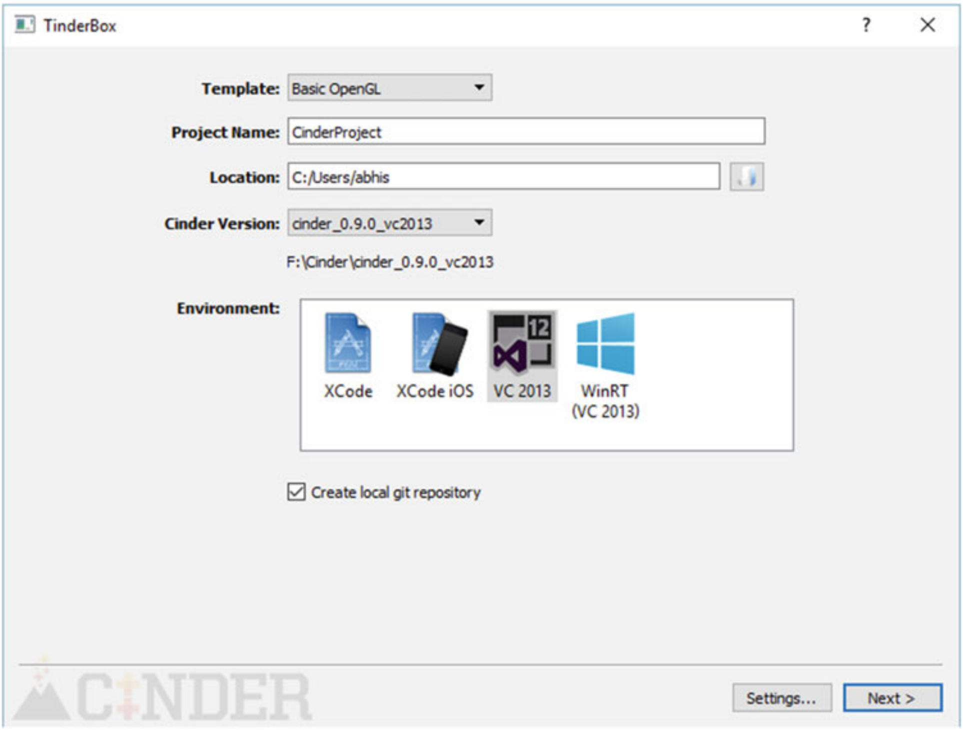
Now launch the `TinderBox.exe` file to run the application, as shown in Figure 5-15.


This PC › abhishekcontent (F:) › Cinder › cinder_0.9.0_vc2013 › tools › TinderBox-Win ›
Search TinderBox-Win
s
ls
ts
ls
ts
ls
(C:)
Open
Run as administrator
Troubleshoot compatibility
Run with graphics processor
Pin to Start

Name	Date modified	Type	Size
platforms	02-10-2015 02:48	File folder	
icudt52.dll	02-10-2015 02:48	Application extens...	22,957 KB
icuin52.dll	02-10-2015 02:48	Application extens...	1,780 KB
icuuc52.dll	02-10-2015 02:48	Application extens...	1,312 KB
libEGL.dll	02-10-2015 02:48	Application extens...	42 KB
libGLESv2.dll	02-10-2015 02:48	Application extens...	709 KB
msvcp120.dll	02-10-2015 02:48	Application extens...	445 KB
msvcr120.dll	02-10-2015 02:48	Application extens...	949 KB
Qt5Core.dll	02-10-2015 02:48	Application extens...	3,985 KB
Qt5Gui.dll	02-10-2015 02:48	Application extens...	3,154 KB
Qt5Widgets.dll	02-10-2015 02:48	Application extens...	4,197 KB
Qt5Xml.dll	02-10-2015 02:48	Application extens...	147 KB
README	02-10-2015 02:48	File	1 KB
TinderBox.exe	02-10-2015 02:48	Application	1,263 KB

Figure 5-15. Opening the `TinderBox.exe` file

Select the Basic template option with Visual Studio 2013 and click Next, as seen in Figure 5-16.



TinderBox

Template: Basic OpenGL

Project Name: CinderProject

Location: C:/Users/abhis

Cinder Version: cinder_0.9.0_vc2013

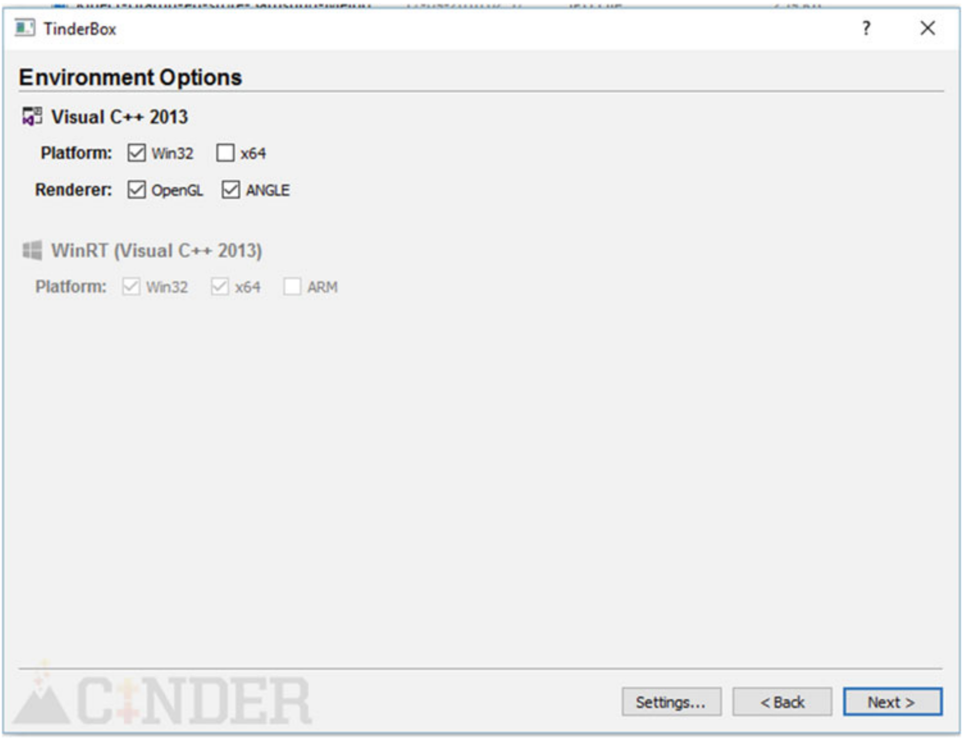
F:\Cinder\cinder_0.9.0_vc2013

Environment: XCode, XCode iOS, VC 2013, WinRT (VC 2013)

☑ Create local git repository

Figure 5-16. *The project options with TinderBox*

Now you can set up environment options for the project, as depicted in Figure 5-17.



Environment Options

Visual C++ 2013

Platform: ☑ Win32 □ x64

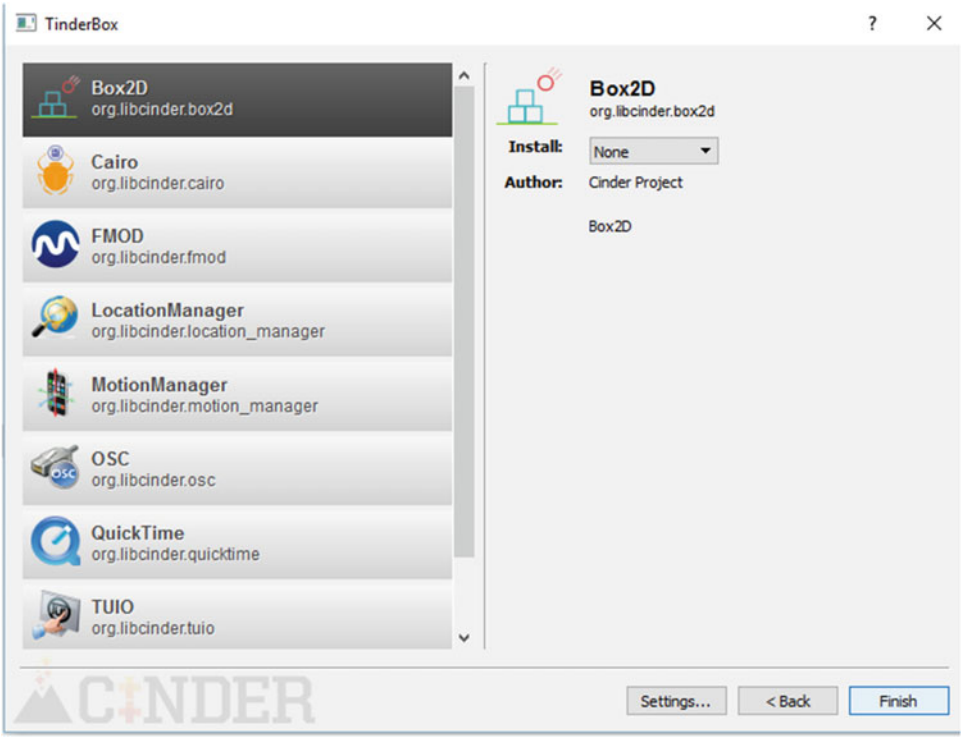
Renderer: ☑ OpenGL ☑ ANGLE

WinRT (Visual C++ 2013)

Platform: ☑ Win32 ☑ x64 □ ARM

Figure 5-17. *Select the environment option here*

In the next step, shown in Figure 5-18, you can add third-party libraries.



Box2D
org.libcinder.box2d

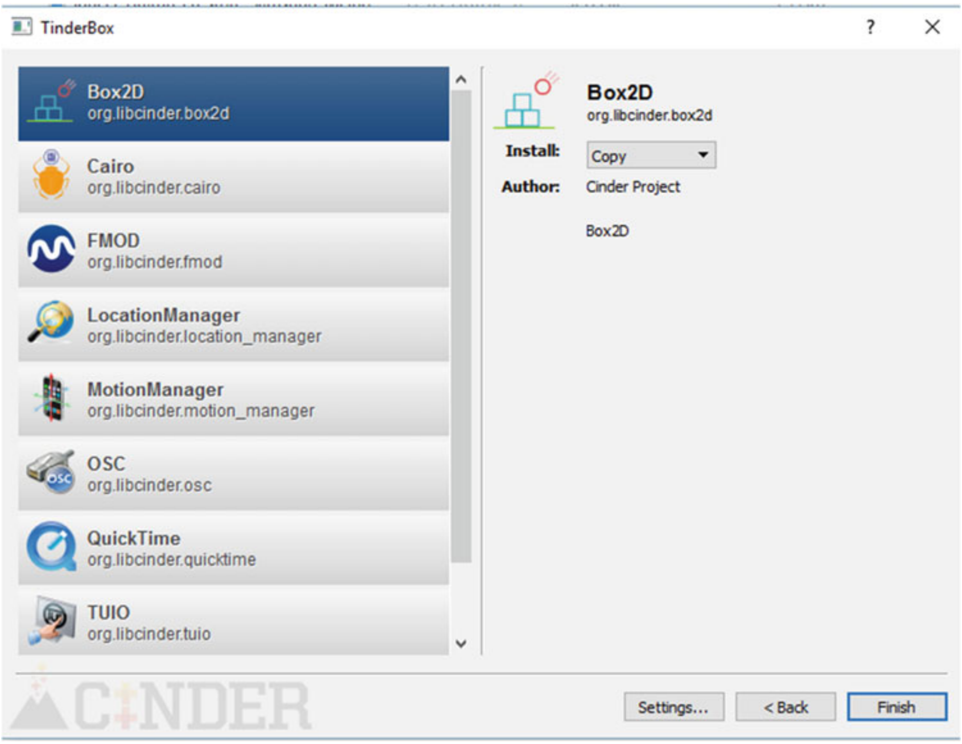
Install: None

Author: Cinder Project

Box2D

Figure 5-18. *Select a third-party library*

From the list of avalable libraries, select the one you want to install and then click Finish, as shown in Figure 5-19.



Box2D
org.libcinder.box2d

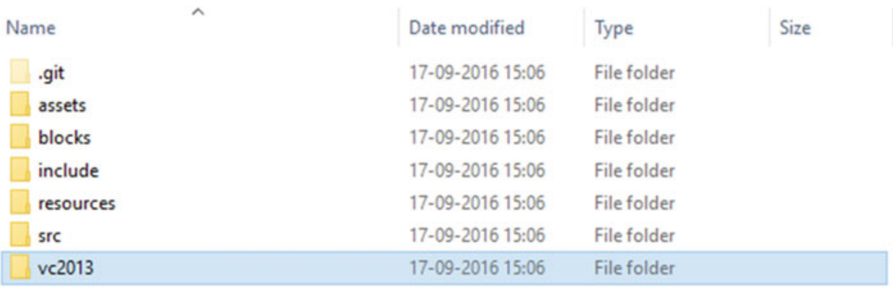
Install: Copy

Author: Cinder Project

Box2D

__Figure 5-19.__ Selecting the Box2D library

This results in a folder structure that you can open in Microsoft Visual Studio 2013, which is displayed in Figure 5-20.



Name	Date modified	Type	Size
.git	17-09-2016 15:06	File folder	
assets	17-09-2016 15:06	File folder	
blocks	17-09-2016 15:06	File folder	
include	17-09-2016 15:06	File folder	
resources	17-09-2016 15:06	File folder	
src	17-09-2016 15:06	File folder	
vc2013	17-09-2016 15:06	File folder	

__Figure 5-20.__ The file structure for Visual Studio 2013

What Can We Do with Cinder?

Cinder helps in several domains and brings the aspect of creative coding to its full potential. Figure 5-21 shows the wide variety of uses for which we can implement it.

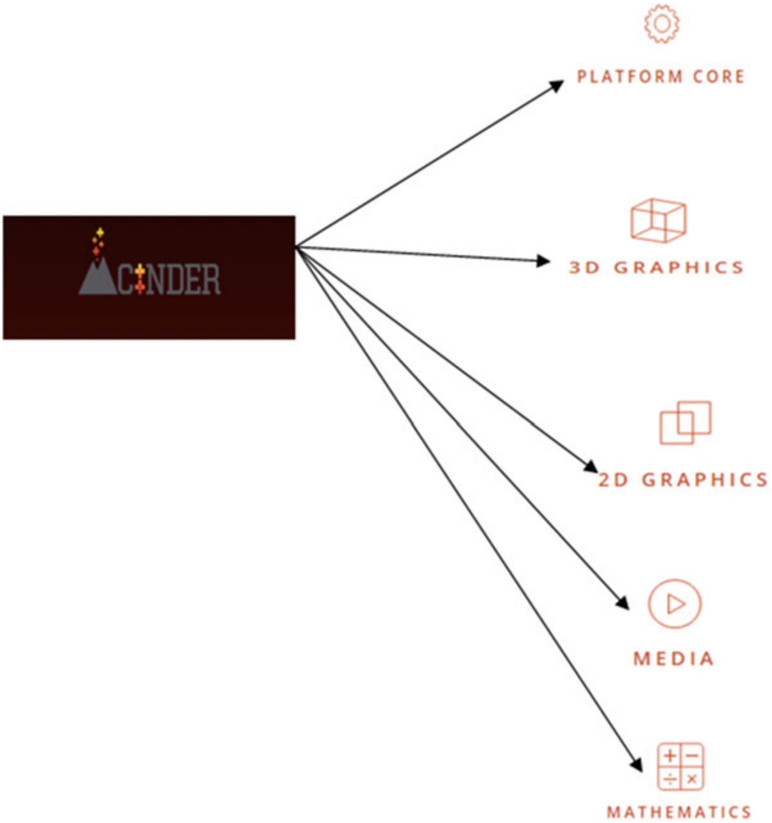


Figure 5-21. *Cinder capabilities*

Let’s have a brief look at the details.

- *Platform core*: Stand-alone Mac and PC applications (platform-native Windows and event handling done), C++ Core, screensavers, Internet I/O, multitouch, UI events, and communication APIs.
- *3D graphics*: Core classes (perspective and orthographic cameras, triangle meshes, OBJ loading, and geometric primitives).
- OpenGL core, OpenGL classes, geometry synthesis, and GUI parameters.
- *2D graphics*: Robust image I/O, image processing, HDR imaging, powerful 2D rasterizer, fonts, and text.
- *Media*: Video capture, open CV, full-featured QuickTime, audio I/O, modular audio nodes, and audio processing.
- *Mathematics*: GLM math primitives, utilities, and geometric primitives.

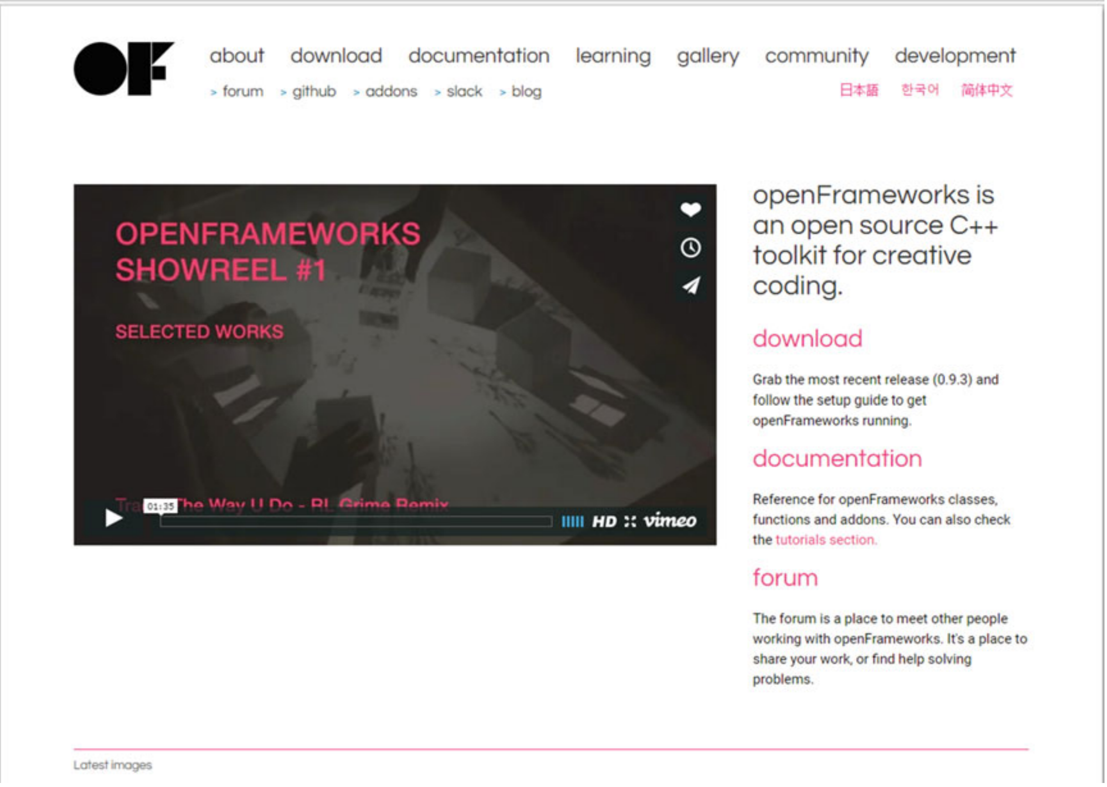
Now that we’ve provided an introduction to Cinder, let’s move to the details about another C++ framework, openFrameworks.

openFrameworks

One of the most important frameworks and a good utility toolkit for creative coding is openFrameworks (Figure 5-22).

Figure 5-22. *openFrameworks*

The openFrameworks home page (`http://openframeworks.cc/`) is shown in Figure 5-23. All of the details about downloading the framework are available from this page.



openFrameworks is an open source C++ toolkit for creative coding.

download

Grab the most recent release (0.9.3) and follow the setup guide to get openFrameworks running.

documentation

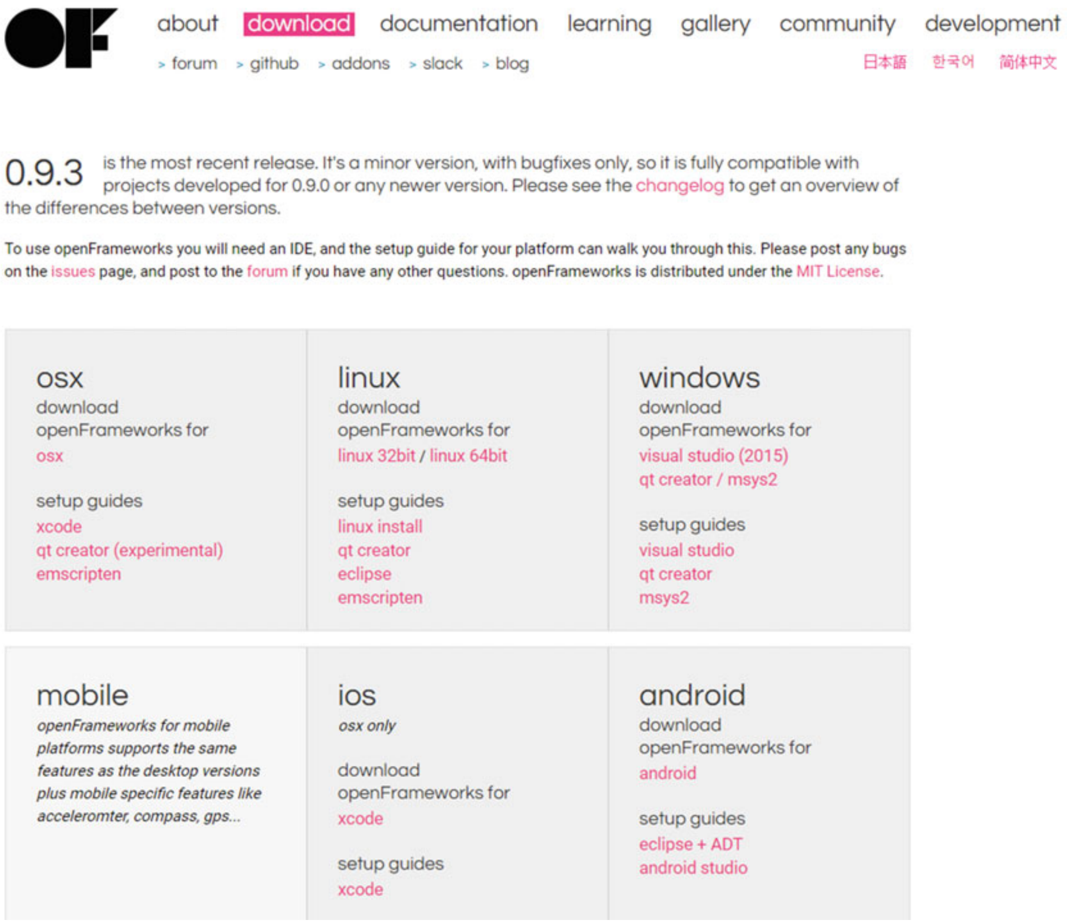
Reference for openFrameworks classes, functions and addons. You can also check the tutorials section.

forum

The forum is a place to meet other people working with openFrameworks. It's a place to share your work, or find help solving problems.

Figure 5-23. *The openFrameworks home page*

An excellent feature of openFrameworks is that it is available in Windows, OSX, Linux, Android, and JavaScript (through ECMA 6.0). The download options on the main page are shown in Figure 5-24.



0.9.3 is the most recent release. It's a minor version, with bugfixes only, so it is fully compatible with projects developed for 0.9.0 or any newer version. Please see the changelog to get an overview of the differences between versions.

To use openFrameworks you will need an IDE, and the setup guide for your platform can walk you through this. Please post any bugs on the issues page, and post to the forum if you have any other questions. openFrameworks is distributed under the MIT License.

osx
download
openFrameworks for
osx

setup guides
xcode
qt creator (experimental)
emscripten

linux
download
openFrameworks for
linux 32bit / linux 64bit

setup guides
linux install
qt creator
eclipse
emscripten

windows
download
openFrameworks for
visual studio (2015)
qt creator / msys2

setup guides
visual studio
qt creator
msys2

mobile
openFrameworks for mobile platforms supports the same features as the desktop versions plus mobile specific features like acceleromter, compass, gps...

ios
osx only

download
openFrameworks for
xcode

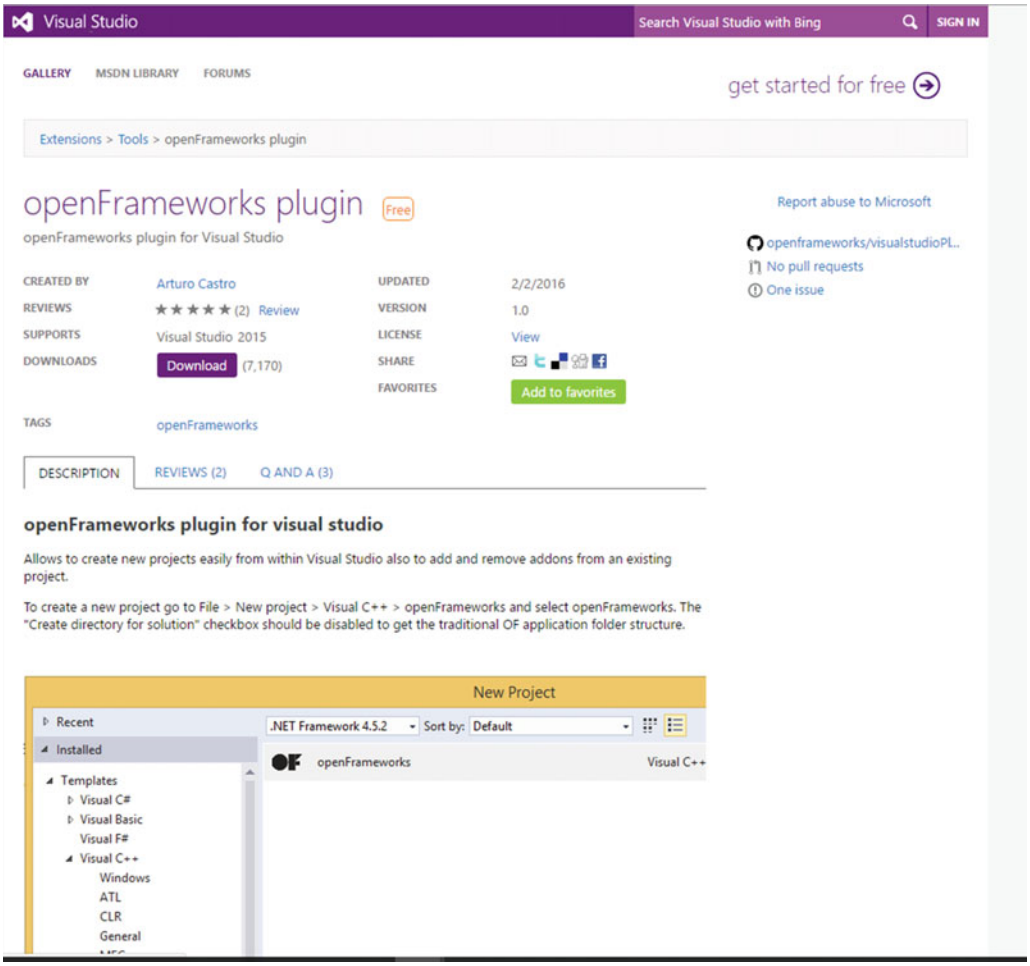
setup guides
xcode

android
download
openFrameworks for
android

setup guides
eclipse + ADT
android studio

***Figure 5-24.** openFrameworks download options*

We will set openFrameworks to operate on a Windows platform using Microsoft Visual Studio 2015. The download package is also available using the Visual Studio Gallery, shown in Figure 5-25. It is the openFrameworks plug-in that we have to download.



Extensions > Tools > openFrameworks plugin

openFrameworks plugin Free

openFrameworks plugin for Visual Studio

CREATED BY	Arturo Castro	UPDATED	2/2/2016
REVIEWS	★★★★★ (2) Review	VERSION	1.0
SUPPORTS	Visual Studio 2015	LICENSE	View
DOWNLOADS	Download (7,170)	SHARE	
		FAVORITES	Add to favorites
TAGS	openFrameworks		

Report abuse to Microsoft

openframeworks/visualstudioPl...

No pull requests

One issue

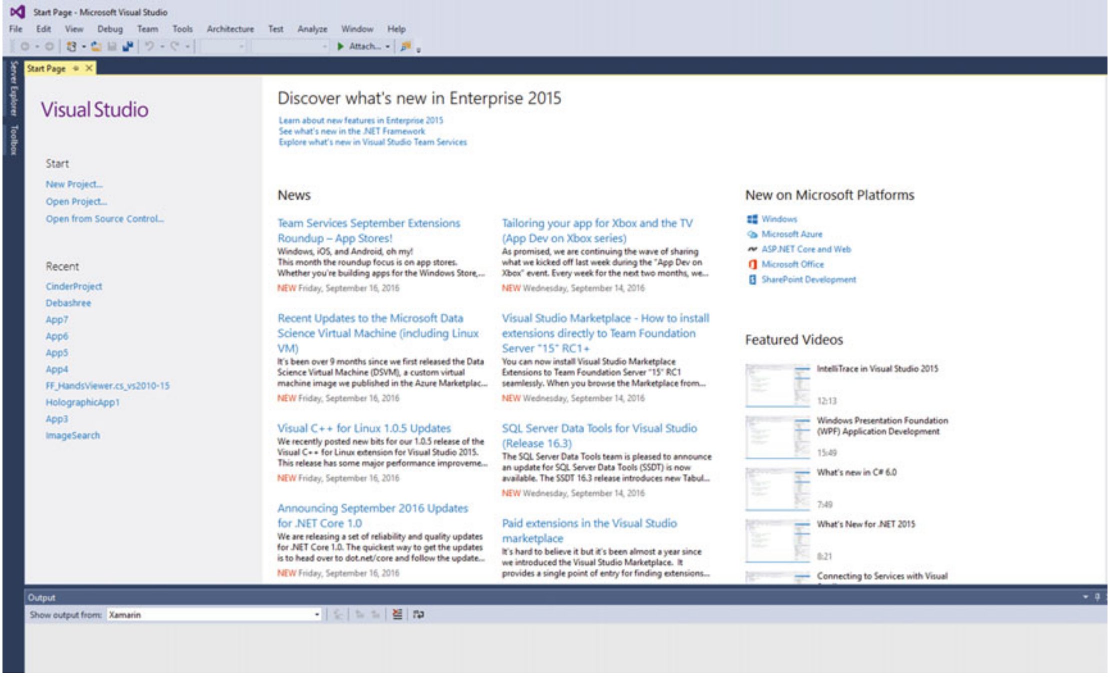
openFrameworks plugin for visual studio

Allows to create new projects easily from within Visual Studio also to add and remove addons from an existing project.

To create a new project go to File > New project > Visual C++ > openFrameworks and select openFrameworks. The "Create directory for solution" checkbox should be disabled to get the traditional OF application folder structure.

Figure 5-25. *Downloading the openFrameworks plug-in*

You can now go through the steps to set up openFrameworks in Visual Studio 2015. First, launch Visual Studio 2015, as shown in Figure 5-26.


Start Page - Microsoft Visual Studio
File Edit View Debug Team Tools Architecture Test Analyze Window Help
Attach...
Server Explorer
Toolbox
Start Page
Visual Studio
Start
New Project...
Open Project...
Open from Source Control...
Recent
CinderProject
Debashree
App7
App6
App5
App4
FF_HandsViewer.cs_vs2010-15
HolographicApp1
App3
ImageSearch
Learn about new features in Enterprise 2015
See what's new in the .NET Framework
Explore what's new in Visual Studio Team Services
New on Microsoft Platforms
Windows
Microsoft Azure
ASP.NET Core and Web
Microsoft Office
SharePoint Development
Featured Videos
IntelliTrace in Visual Studio 2015
12:13
Windows Presentation Foundation (WPF) Application Development
15:49
What's new in C# 6.0
7:49
What's New for .NET 2015
8:21
Connecting to Services with Visual
Output
Show output from: Xamarin

Discover what's new in Enterprise 2015

News

Team Services September Extensions Roundup – App Stores!
Windows, iOS, and Android, oh my!
This month the roundup focus is on app stores. Whether you're building apps for the Windows Store,...
NEW Friday, September 16, 2016

Recent Updates to the Microsoft Data Science Virtual Machine (including Linux VM)
It's been over 9 months since we first released the Data Science Virtual Machine (DSVM), a custom virtual machine image we published in the Azure Marketplac...
NEW Friday, September 16, 2016

Visual C++ for Linux 1.0.5 Updates
We recently posted new bits for our 1.0.5 release of the Visual C++ for Linux extension for Visual Studio 2015. This release has some major performance improveme...
NEW Friday, September 16, 2016

Announcing September 2016 Updates for .NET Core 1.0
We are releasing a set of reliability and quality updates for .NET Core 1.0. The quickest way to get the updates is to head over to dot.net/core and follow the update...
NEW Friday, September 16, 2016

Tailoring your app for Xbox and the TV (App Dev on Xbox series)
As promised, we are continuing the wave of sharing what we kicked off last week during the "App Dev on Xbox" event. Every week for the next two months, we...
NEW Wednesday, September 14, 2016

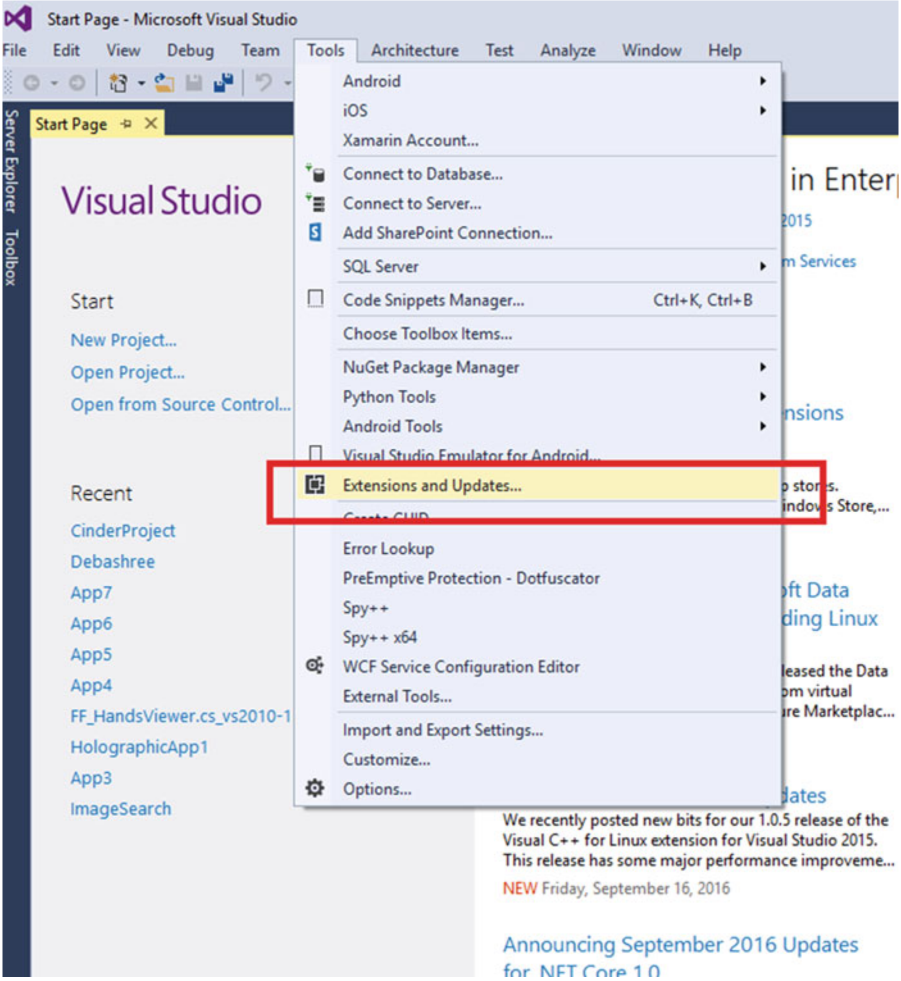
Visual Studio Marketplace - How to install extensions directly to Team Foundation Server "15" RC1+
You can now install Visual Studio Marketplace Extensions to Team Foundation Server "15" RC1 seamlessly. When you browse the Marketplace from...
NEW Wednesday, September 14, 2016

SQL Server Data Tools for Visual Studio (Release 16.3)
The SQL Server Data Tools team is pleased to announce an update for SQL Server Data Tools (SSDT) is now available. The SSDT 16.3 release introduces new Tabul...
NEW Wednesday, September 14, 2016

Paid extensions in the Visual Studio marketplace
It's hard to believe it but it's been almost a year since we introduced the Visual Studio Marketplace. It provides a single point of entry for finding extensions...

Figure 5-26. *Visual Studio Start page*

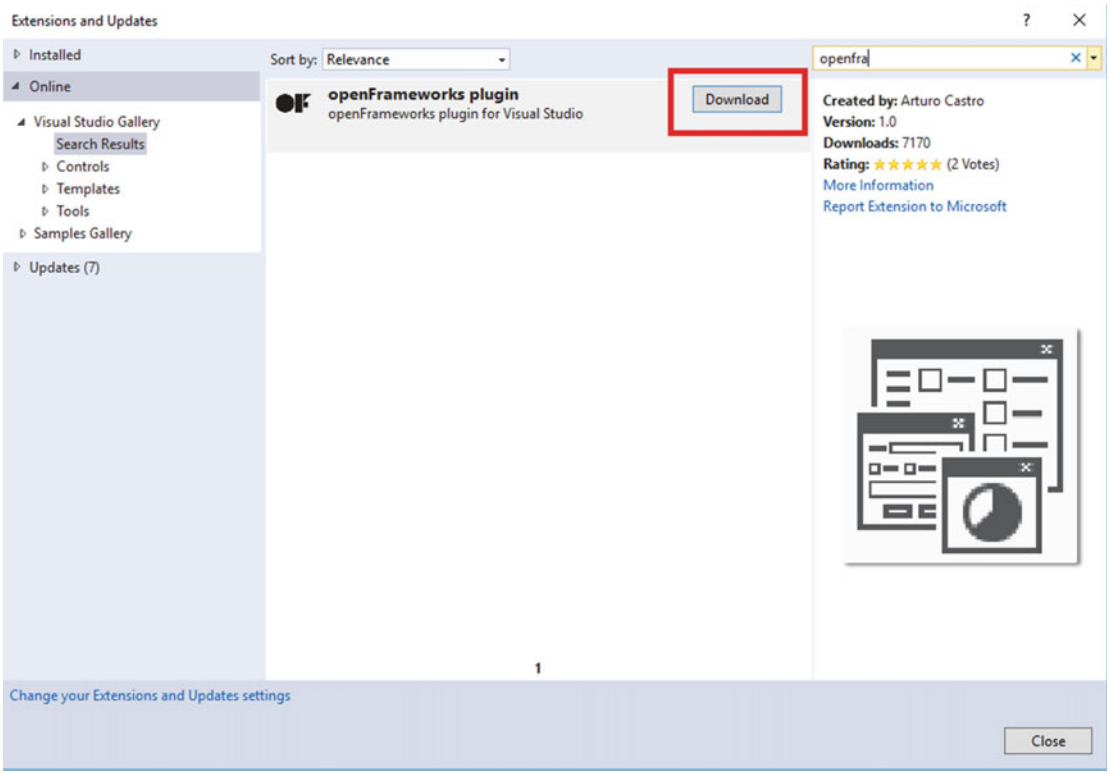
Click Tools and then select Extensions and Updates, as shown in Figure 5-27.



We recently posted new bits for our 1.0.5 release of the Visual C++ for Linux extension for Visual Studio 2015. This release has some major performance improveme...

Figure 5-27. *Extensions and updates in Visual Studio*

Next you need to find openFrameworks within the Extensions and Updates list. Click Download to download the plug-in, as depicted in Figure 5-28.



Sort by: Relevance

openfra

Created by: Arturo Castro
Version: 1.0
Downloads: 7170
Rating: ★★★★★ (2 Votes)

Figure 5-28. *openFrameworks download plug-in option*

After the download is complete, you need to restart Visual Studio 2015. Click File, then select New, then Project, as highlighted in Figure 5-29.

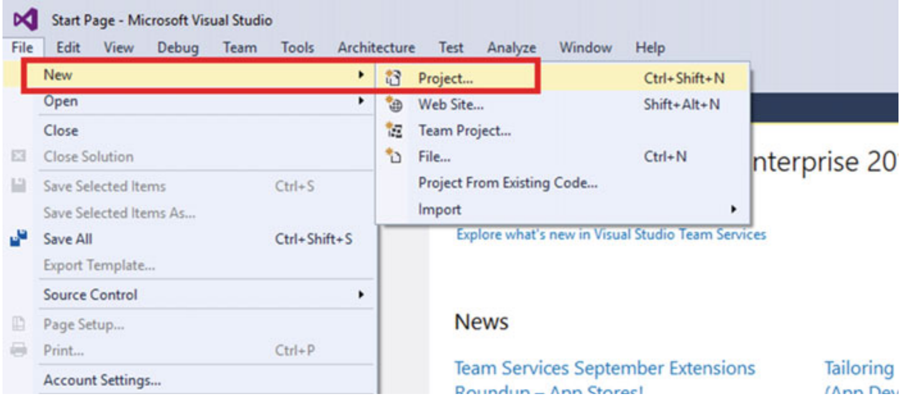
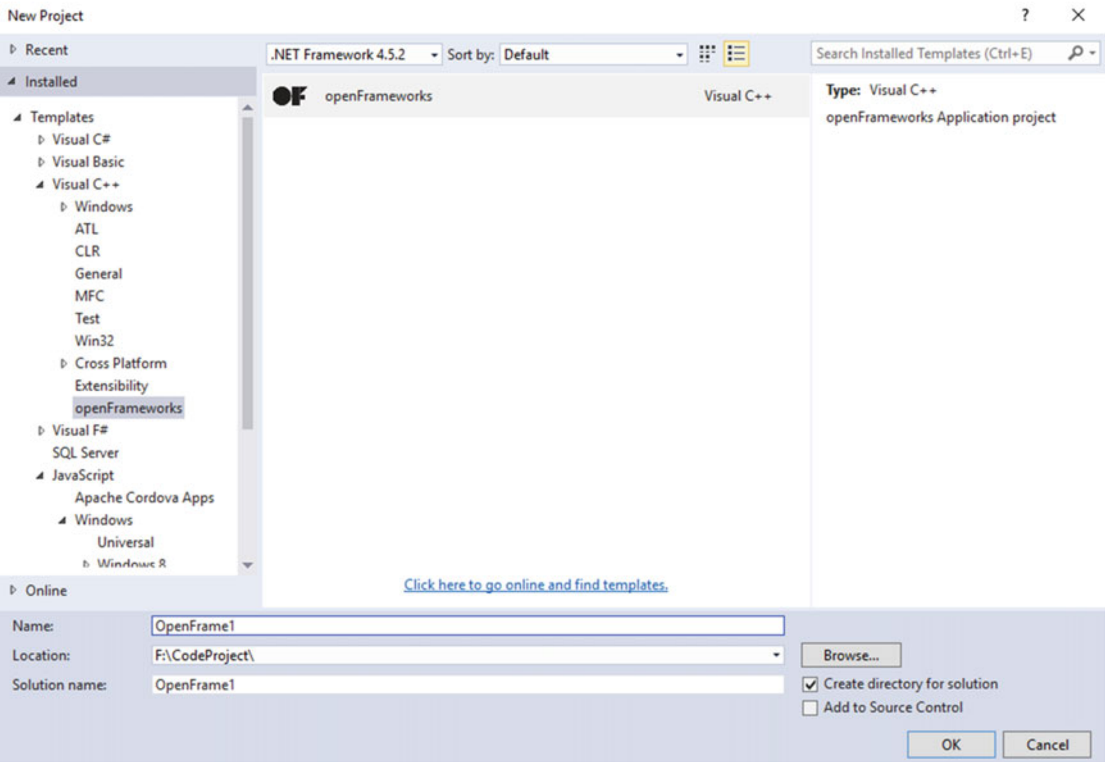


Figure 5-29. *Opening a new project in Visual Studio 2015*

Select the openFrameworks template option from the C++ templates. This template allows us to create a creative coding project within Visual Studio 2015. Name the project OpenFrame1, as shown in Figure 5-30.



.NET Framework 4.5.2 Sort by: Default

openFrameworks Visual C++

Type: Visual C++

openFrameworks Application project

Name: OpenFrame1

Location: F:\CodeProject\

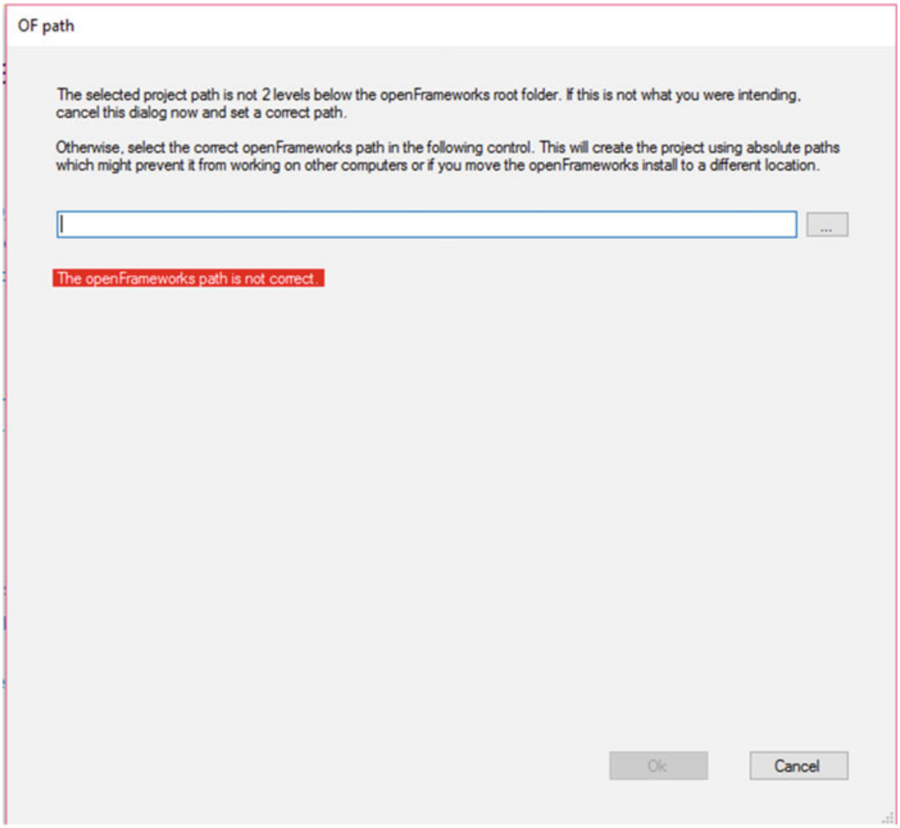
Solution name: OpenFrame1

☑ Create directory for solution

□ Add to Source Control

Figure 5-30. *Naming the project OpenFrame1*

Click OK to open the project. It will next look for openFrameworks that we have to install from the Web (see Figure 5-31).



OF path

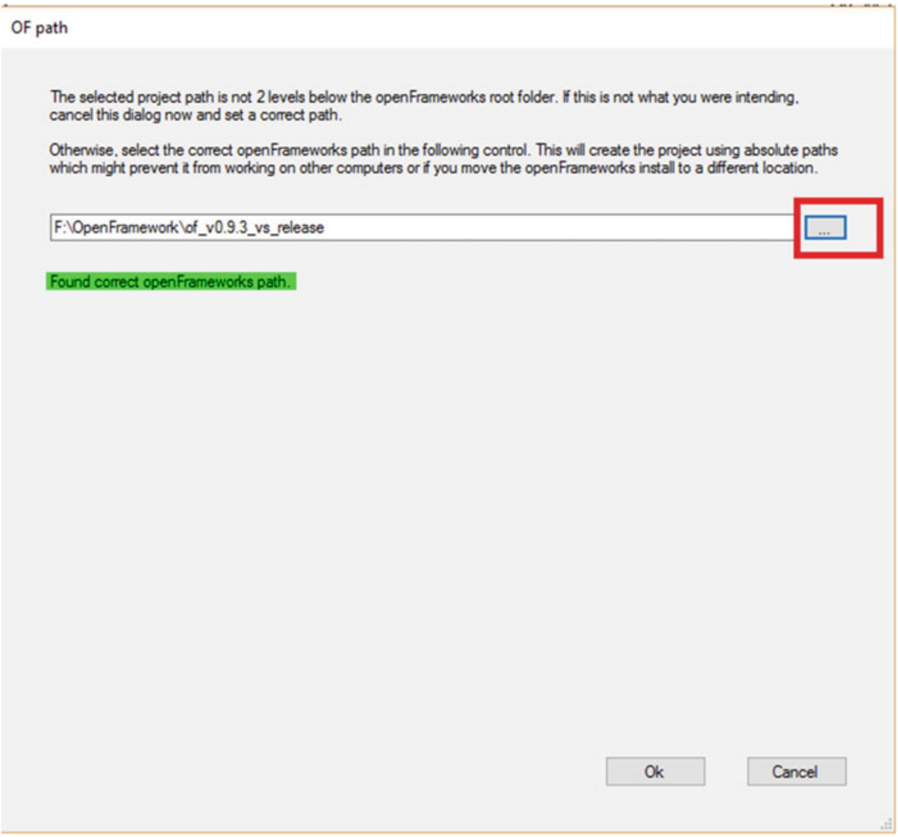
The selected project path is not 2 levels below the openFrameworks root folder. If this is not what you were intending, cancel this dialog now and set a correct path.

Otherwise, select the correct openFrameworks path in the following control. This will create the project using absolute paths which might prevent it from working on other computers or if you move the openFrameworks install to a different location.

The openFrameworks path is not correct.

Figure 5-31. *Checking for openFrameworks path*

After you extract the downloaded framework, you must select the correct path, as in Figure 5-32.



OF path

The selected project path is not 2 levels below the openFrameworks root folder. If this is not what you were intending, cancel this dialog now and set a correct path.

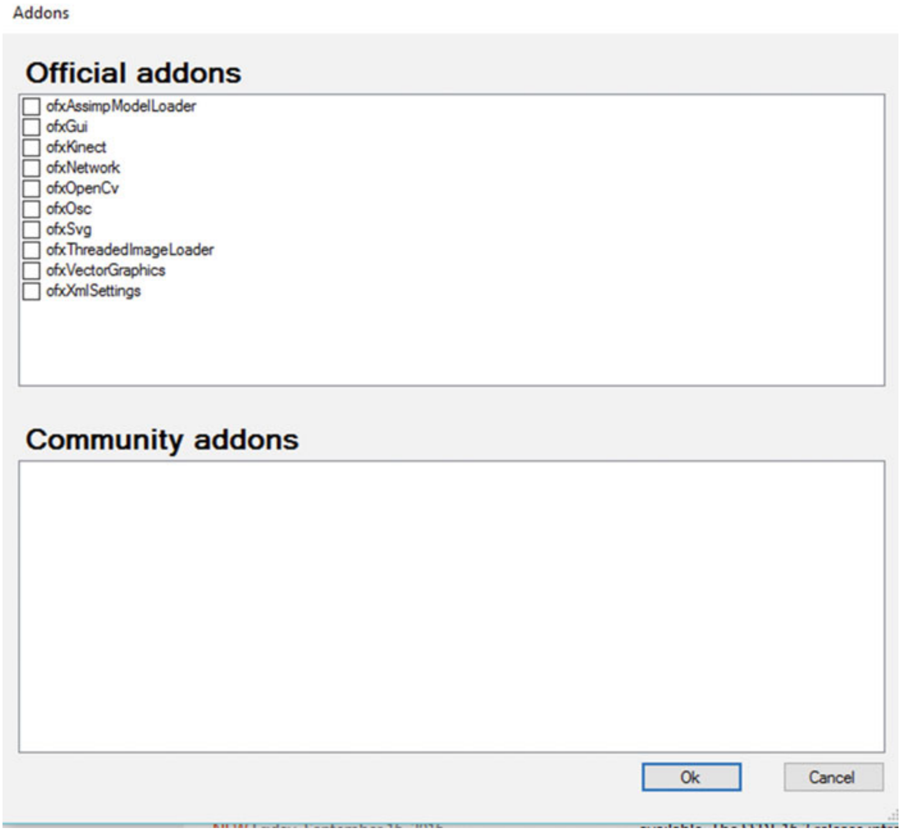
Otherwise, select the correct openFrameworks path in the following control. This will create the project using absolute paths which might prevent it from working on other computers or if you move the openFrameworks install to a different location.

F:\OpenFramework\of_v0.9.3_vs_release

Found correct openFrameworks path.

Figure 5-32. *Select the right path for openFrameworks*

When you click OK, you are presented with numerous add-on options, as depicted in Figure 5-33.



Addons

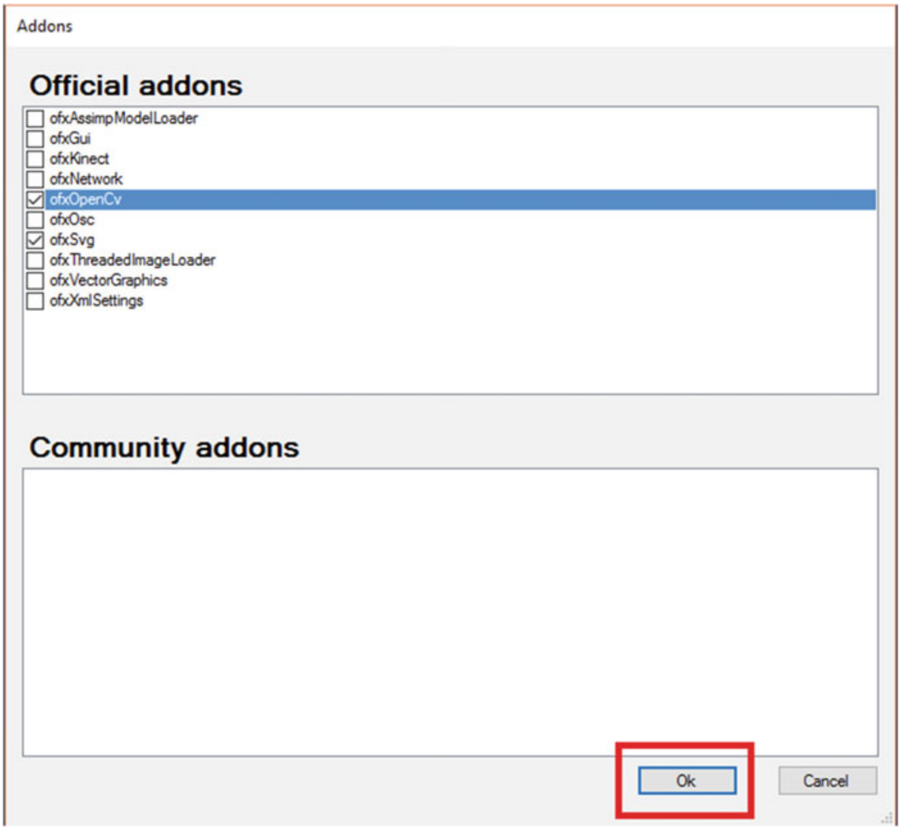
Official addons

- □ ofxAssimpModelLoader
- □ ofxGui
- □ ofxKinect
- □ ofxNetwork
- □ ofxOpenCv
- □ ofxOsc
- □ ofxSvg
- □ ofxThreadedImageLoader
- □ ofxVectorGraphics
- □ ofxXmlSettings

Community addons

Figure 5-33. *Selecting add-ons*

Select the desired add-ons and then click OK to create a simple project, as shown in Figure 5-34.



Addons

Official addons

- ☐ ofxAssimpModelLoader
- ☐ ofxGui
- ☐ ofxKinect
- ☐ ofxNetwork
- ☑ ofxOpenCv
- ☐ ofxOsc
- ☑ ofxSvg
- ☐ ofxThreadedImageLoader
- ☐ ofxVectorGraphics
- ☐ ofxXmlSettings

Community addons

Figure 5-34. *Selecting the appropriate add-ons*

In the Solution Explorer for Visual Studio, shown in Figure 5-35, the entire openFrameworks option is available.

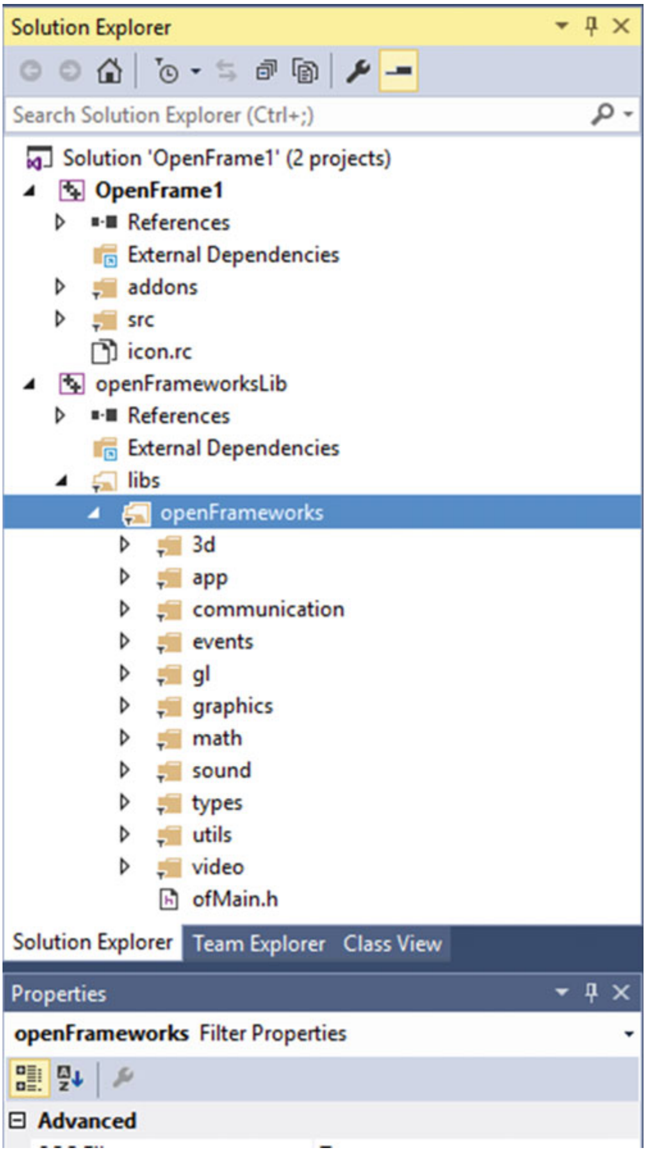


Figure 5-35. *The openFrameworks option*

You can then run the app, as shown in Figure 5-36.

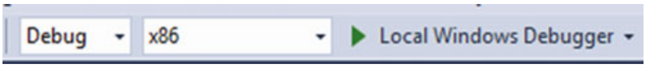
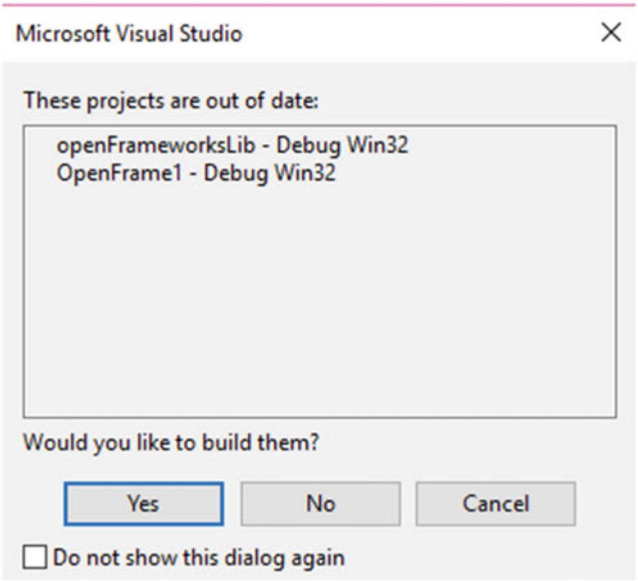


Figure 5-36. *Running the app*

If the dialog box indicates that a project is out of date, click Yes to build it, as shown in Figure 5-37.



Microsoft Visual Studio

These projects are out of date:

openFrameworksLib - Debug Win32
OpenFrame1 - Debug Win32

Would you like to build them?

□ Do not show this dialog again

Figure 5-37. *Building projects that are out of date*

In the next, section we start discussing Processing as a creative coding language and also extend it further. Add a window resizing option to the setup function (see Listing 5-1) so that when we run the app, the app window resizes.

Listing 5-1. Adding Window Resizing Logic

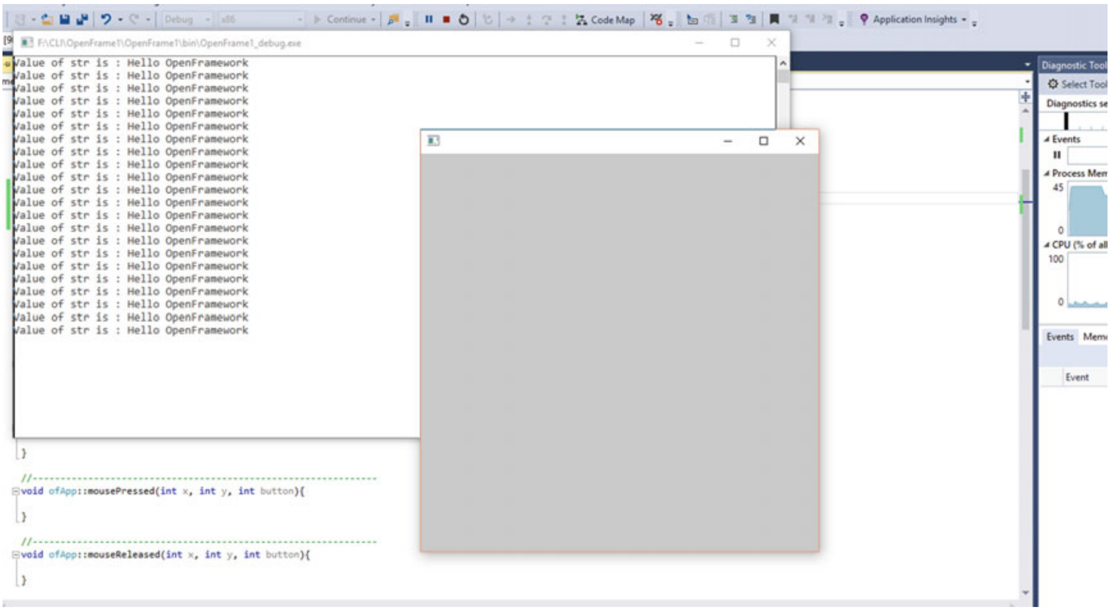
```
void ofApp::setup(){
        ofSetWindowShape(500, 500);
        ofSetWindowPosition(10, 10);

}
```

We also add a logic for a key pressed event, as shown in Listing 5-2.

Listing 5-2. Key Pressed Event

```
void ofApp::keyPressed(int key){
        char str[] = "Hello OpenFramework";

        cout << "Value of str is : " << str << endl;

}
```

The output for the project is displayed in Figure 5-38.



```
Value of str is : Hello OpenFramework
Value of str is : Hello OpenFramework
Value of str is : Hello OpenFramework
Value of str is : Hello OpenFramework
Value of str is : Hello OpenFramework
Value of str is : Hello OpenFramework
Value of str is : Hello OpenFramework
Value of str is : Hello OpenFramework
Value of str is : Hello OpenFramework
Value of str is : Hello OpenFramework
Value of str is : Hello OpenFramework
Value of str is : Hello OpenFramework
Value of str is : Hello OpenFramework
Value of str is : Hello OpenFramework
Value of str is : Hello OpenFramework
Value of str is : Hello OpenFramework
Value of str is : Hello OpenFramework
Value of str is : Hello OpenFramework
Value of str is : Hello OpenFramework
Value of str is : Hello OpenFramework
Value of str is : Hello OpenFramework
Value of str is : Hello OpenFramework
```

```
}

//--------------------------------------------------------------
void ofApp::mousePressed(int x, int y, int button){

}

//--------------------------------------------------------------
void ofApp::mouseReleased(int x, int y, int button){

}
```

Figure 5-38. *The output for the project*

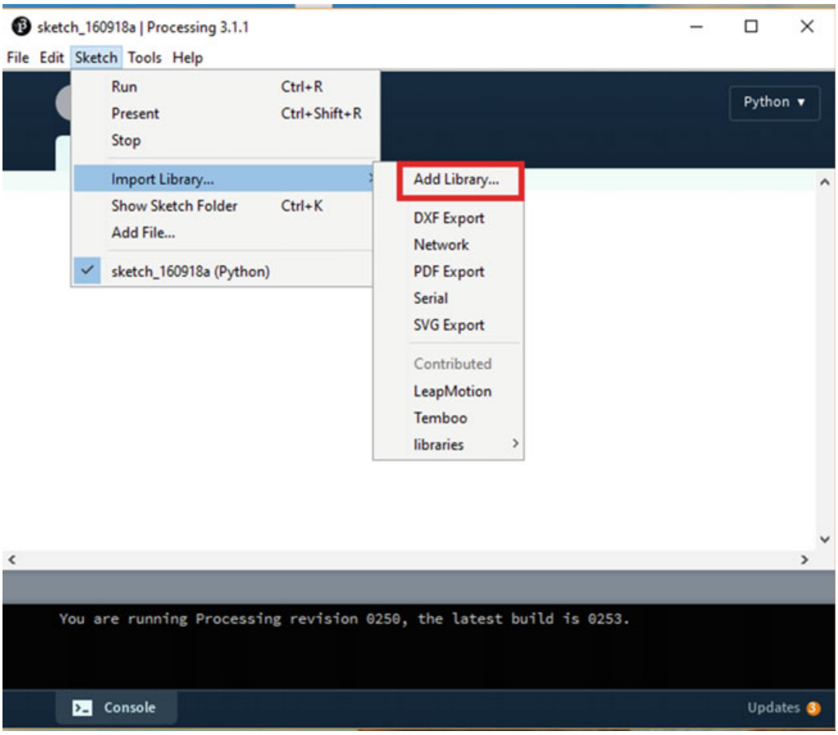
Processing

Processing (see Figure 5-39) is a programming language specially intended for creative coding. The most important part of Processing as a language is that it brings visual arts to life with the help of coding. It helps us to learn the fundamentals of computer programming by actually showing it visually.

Figure 5-39. *Processing icon*

Processing is an open source language that can run on multiple platforms. We can easily get going inside a processing environment in Windows, Linux, or Mac. It is an IDE in which we program and the output is a visual interpretation of the code we write. Everything we code in Processing is considered a sketch. The extension of a file that is saved in Processing is `*.pde`. Another important aspect of Processing is its support for several additional libraries for our usage. More than 100 supportive libraries are available for Processing. Let's take a glimpse at important library options in Processing.

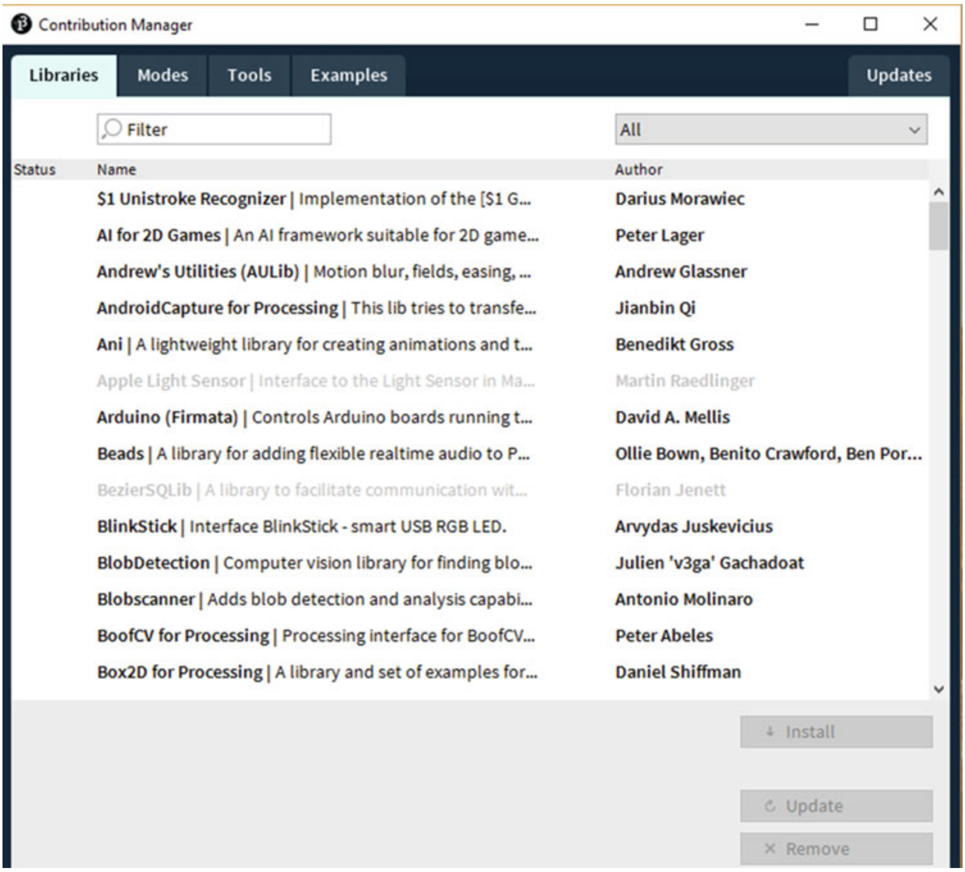
From the IDE, click Sketch, then select Import Library and Add Library as shown in Figure 5-40.



```
You are running Processing revision 0250, the latest build is 0253.
```

Figure 5-40. *Adding a library to the Processing IDE*

Figure 5-41 shows the library options available from the Processing IDE.



Status	Name	Author
	$1 Unistroke Recognizer | Implementation of the [$1 G...	Darius Morawiec
	AI for 2D Games | An AI framework suitable for 2D game...	Peter Lager
	Andrew's Utilities (AULib) | Motion blur, fields, easing, ...	Andrew Glassner
	AndroidCapture for Processing | This lib tries to transfe...	Jianbin Qi
	Ani | A lightweight library for creating animations and t...	Benedikt Gross
	Apple Light Sensor | Interface to the Light Sensor in Ma...	Martin Raedlinger
	Arduino (Firmata) | Controls Arduino boards running t...	David A. Mellis
	Beads | A library for adding flexible realtime audio to P...	Ollie Bown, Benito Crawford, Ben Por...
	BezierSQLib | A library to facilitate communication wit...	Florian Jenett
	BlinkStick | Interface BlinkStick - smart USB RGB LED.	Arvydas Juskevicius
	BlobDetection | Computer vision library for finding blo...	Julien 'v3ga' Gachadoat
	Blobscanner | Adds blob detection and analysis capabi...	Antonio Molinaro
	BoofCV for Processing | Processing interface for BoofCV...	Peter Abeles
	Box2D for Processing | A library and set of examples for...	Daniel Shiffman

Figure 5-41. *Libraries available in the Processing IDE*

The inspiration for developing the Processing language was Open GL. With an already active community, Processing has been extended to support different programming language extensions, as depicted in Figure 5-42.

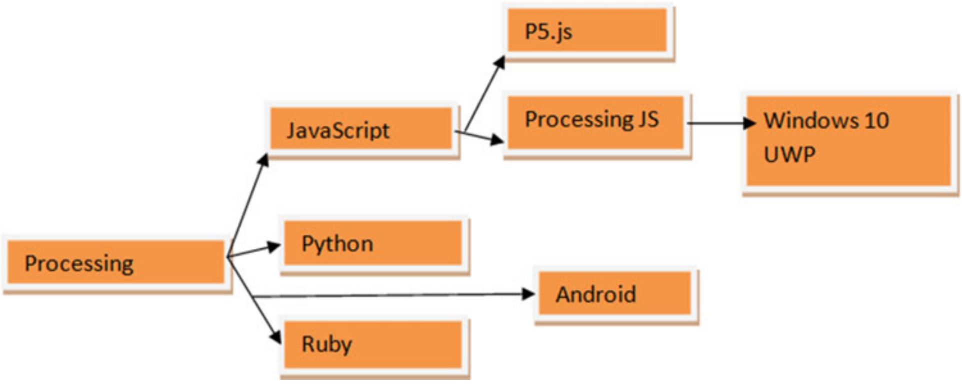


Figure 5-42. *Extended language support for Processing*

The structure of a processing app is represented in Figure 5-43.

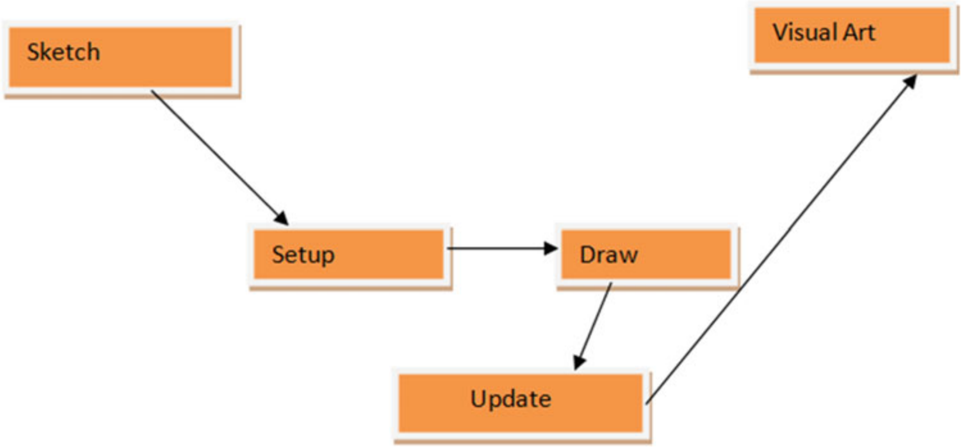


Figure 5-43. *The programming structure for Processing*

When you start working on a Processing project, two functions are particularly important. These functions are `setup ()`, where you declare the size of the screen window, and the `draw ()` function, with which we render the output.

Let's take a look at an example in Listing 5-3. We will draw an ellipse and as the mouse is pressed it will just move around.

Listing 5-3. Simple Processing Example

```
void setup() {
  size(1024, 768);
  noSmooth();
  fill(126);
  background(102);
}

void draw() {
  if (mousePressed) {
    stroke(255);
  } else {
    stroke(0);
  }
  ellipse(mouseX-30, mouseY, mouseX+30, mouseY);
  ellipse(mouseX, mouseY-30, mouseX, mouseY+30);
}
```

You need to click the Run button in the IDE, highlighted in Figure 5-44, to view the output, which is shown in Figure 5-45.

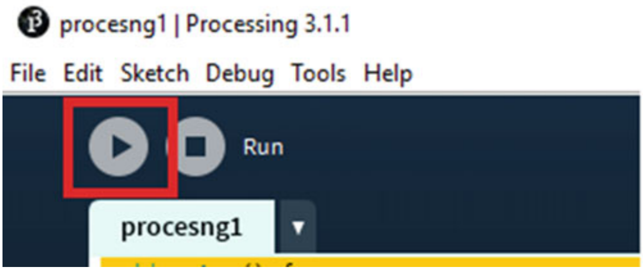

procesng1 | Processing 3.1.1
File Edit Sketch Debug Tools Help
Run
procesng1

Figure 5-44. *Running the program*

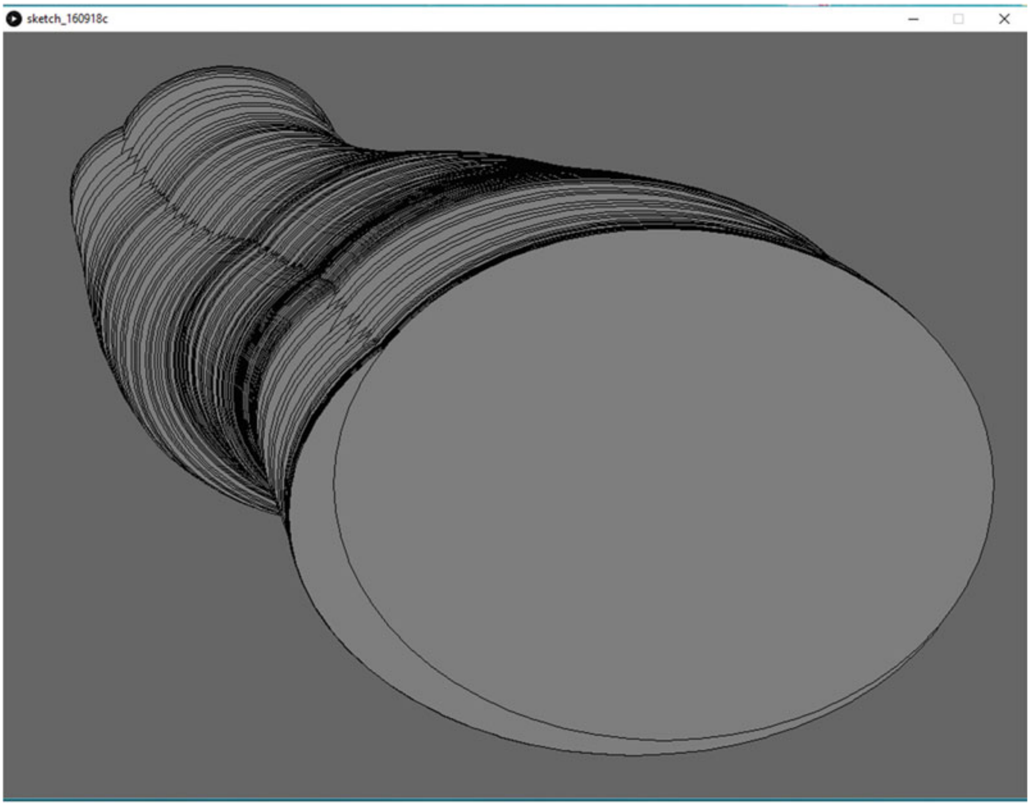


Figure 5-45. *The output*

Next we look at extending the Processing IDE for an Android extension. From the drop-down list at the right side of the IDE, select the Android option for adding a mode (see Figure 5-46).

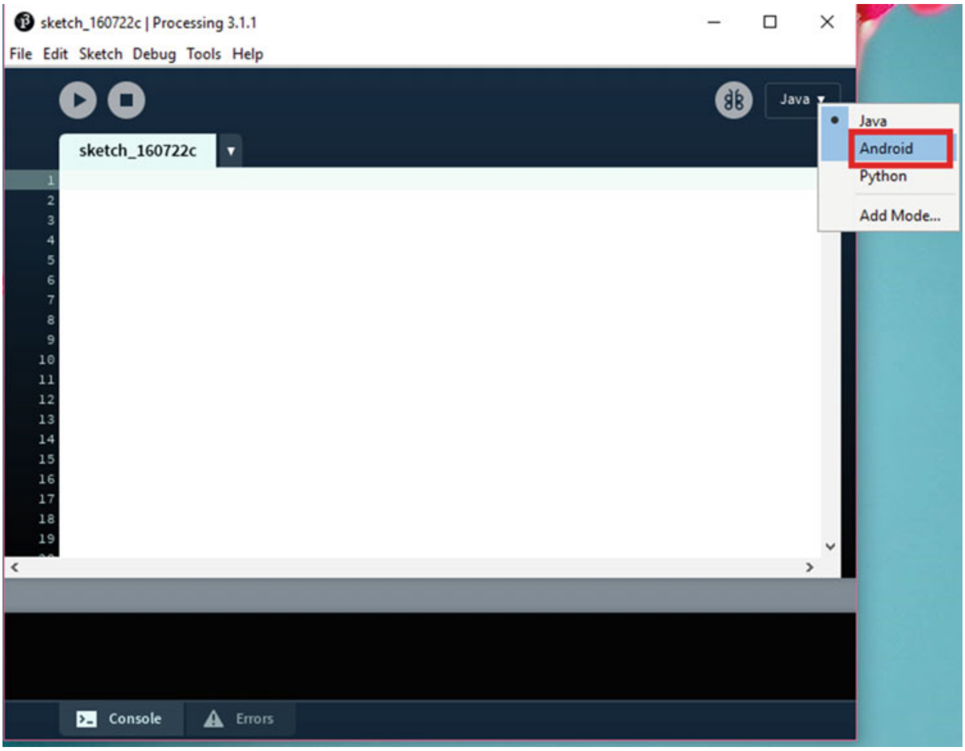
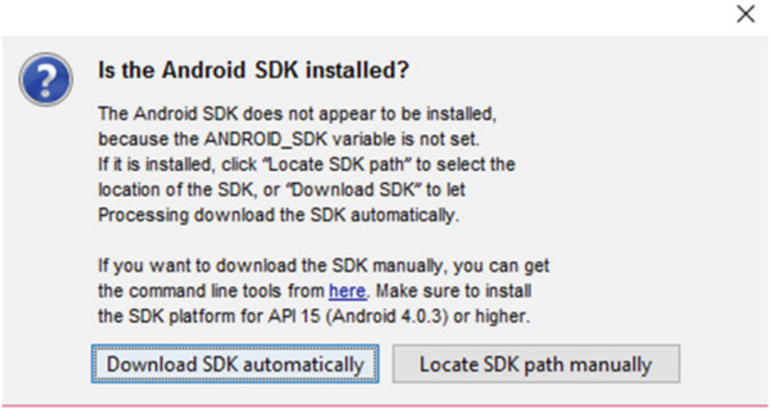

sketch_160722c | Processing 3.1.1
File Edit Sketch Debug Tools Help
Java
sketch_160722c
Java
Android
Python
Add Mode...
Console
Errors

Figure 5-46. *Add an Android mode*

The next option you see, shown in Figure 5-47, is for downloading the Android SDK (if it is not present) or setting it up manually.

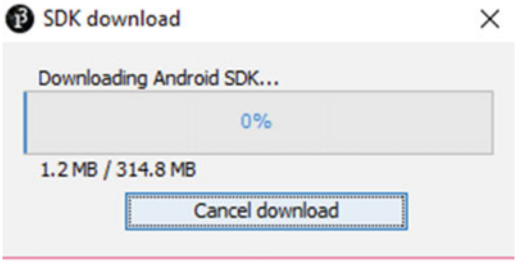

Is the Android SDK installed?

The Android SDK does not appear to be installed, because the ANDROID_SDK variable is not set. If it is installed, click "Locate SDK path" to select the location of the SDK, or "Download SDK" to let Processing download the SDK automatically.

If you want to download the SDK manually, you can get the command line tools from here. Make sure to install the SDK platform for API 15 (Android 4.0.3) or higher.

Figure 5-47. *Preparing the Android SDK*

If you click Download SDK Automatically, it will start the process. You can monitor the download progress in the dialog box shown in Figure 5-48.


SDK download

Downloading Android SDK...

0%

1.2 MB / 314.8 MB

Figure 5-48. *Downloading the Android SDK*

Once the download is complete, the SDK is set up for Android on Processing (see Figure 5-49), so you can compile the app for Android.

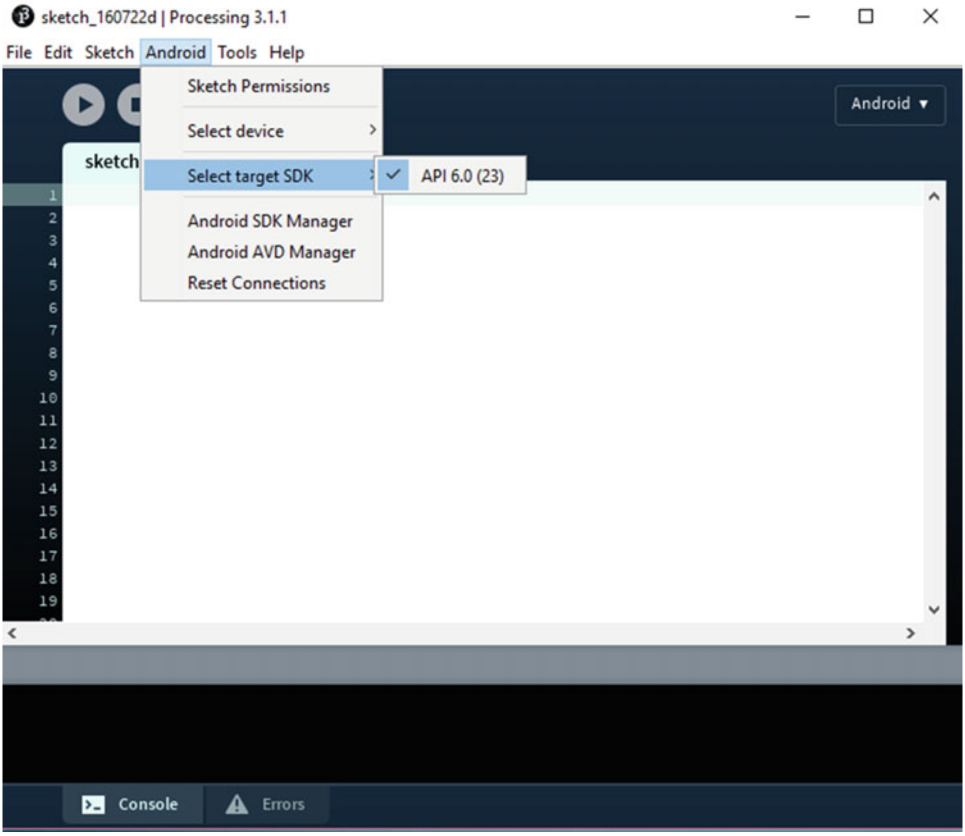

sketch_160722d | Processing 3.1.1

Figure 5-49. *Android option is available*

Summary

This chapter has covered creative coding and then gave an introduction to creative coding frameworks, in addition to an introduction to Processing.

CHAPTER 6

Extending Processing for UWP and IoT with Temboo

In Chapter 5 we went through working with creative coding and started with Processing. In this chapter, we show how Processing can be extended for the Universal Windows Platform and the Internet of Things (IoT) with Temboo platform.

Extending Processing

This chapter starts with a brief introduction to UWP. Then we provide a brief introduction to Processing JS and how to obtain it, followed by the procedure to build Processing JS UWP apps. We give examples and then build it as a package for store. Finally, we cover Processing in terms of IoT with Temboo.

UWP

The Windows 10 UWP platform is an architecture that is specifically designed for coding once it is deployed anywhere for Windows 10 device families. UWP apps run on all devices that run the Windows 10 OS, ranging from phones and tablets to PCs. The apps are generally built with the Visual Studio 2015 IDE. UWP is special because it is built in terms of a single API across all devices.

Figure 6-1 shows how UWP fits into a code once, deploy anywhere usage model.

A. Nandy and D. Chanda, *Beginning Platino Game Engine*, DOI 10.1007/978-1-4842-2484-7_6

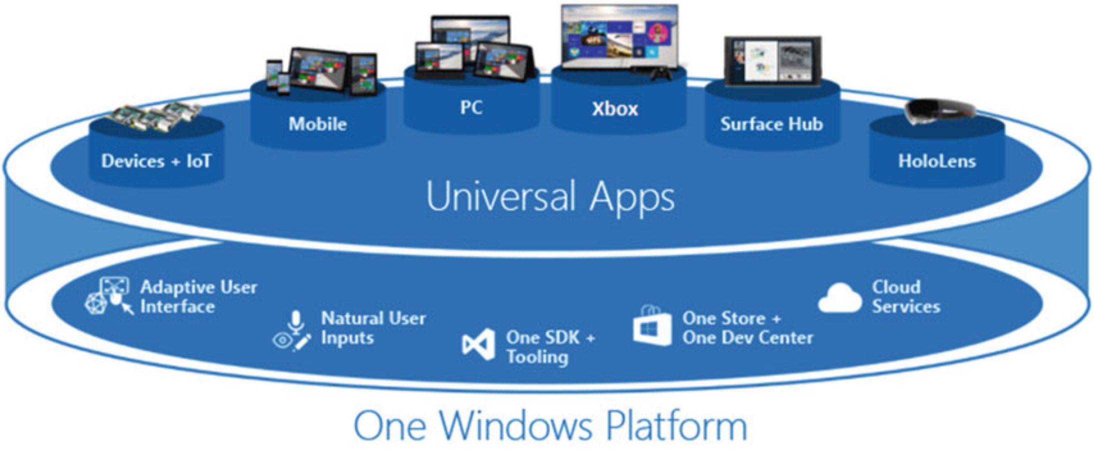


Figure 6-1. *Windows 10 UWP platform*

The Windows Store experience has also changed. It used to be different stores for different platforms, meaning different stores for mobile apps and Windows Store apps. Now it is one place where all the apps for the devices can be seen on the Dashboard and the option for monetization is also seen in a common place. Compatibilty has also changed, as now we can target different versions of Windows 10 the same as Android. This is called binary compatibility across all versions and all device families.

The speciality of UWP is that it can call all APIs across WinRT and also Win32 and .Net APIs, as depicted in Figure 6-2.

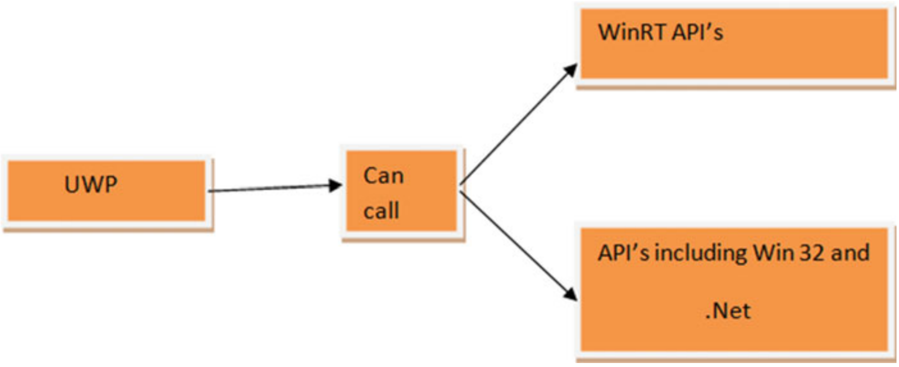


Figure 6-2. *UWP's capability*

Having one core API results in seamless API layer access for all devices. When we develop apps in Microsoft Visual Studio 2015, the result is a single app package that can be installed onto a wide range of devices. An adaptive UI and new features of the layout control help us to distribute a cool-looking app consumed in same manner across all devices.

Device Families

We know in the past, Windows 8 and Windows 8.1 used to target builds that were meant for either Windows Store or mobile devices. Now in Windows 10, though, we build apps and target them for different families that run Windows 10. When targeting an app, it is up to us to target which device we want to build it for.

Figure 6-3 shows that a child device inherits properties of the parent device and also its own functionality to the API, so this is an added combination that is felt across all devices on the platform.

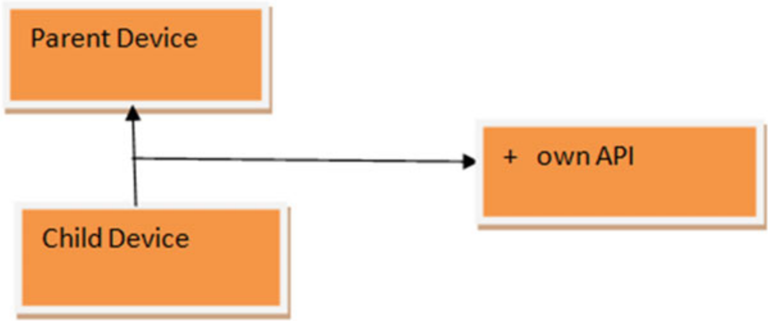


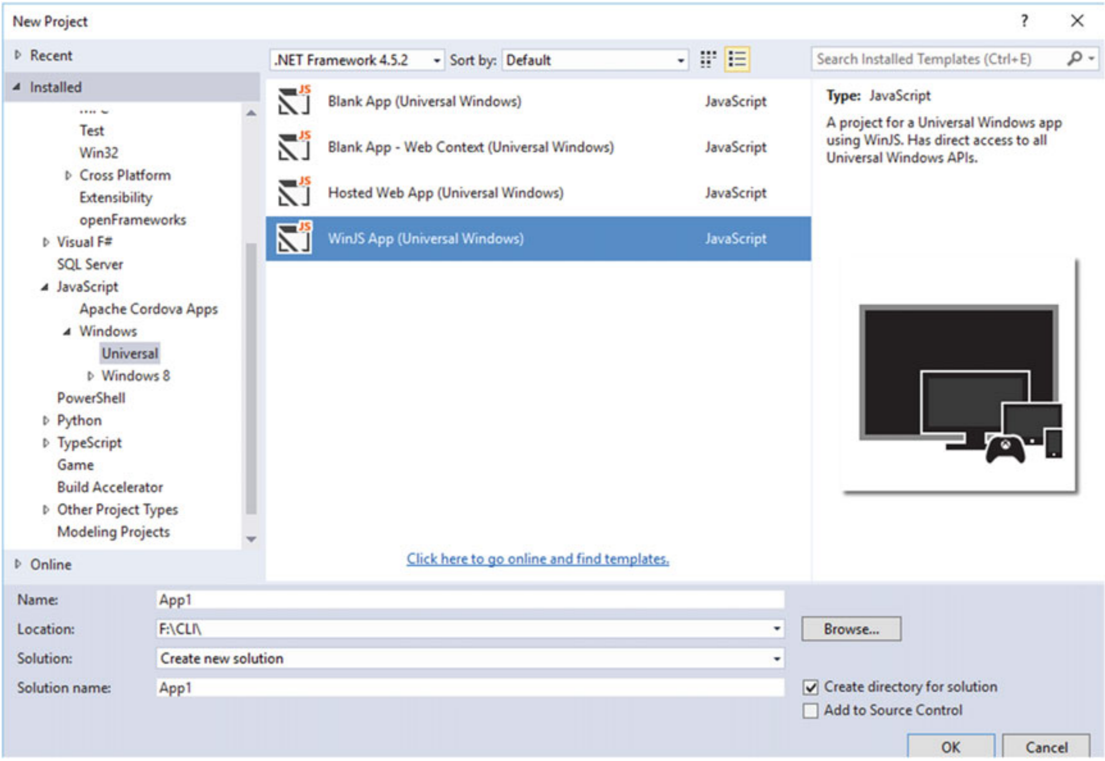
Figure 6-3. *Parent–child accessibilty UWP*

Consequence of Device Family Choice

As we choose from available platforms, say we are developing an app for IoT. We see that the app works perfectly if we install it on a Windows 10 IoT device, say Raspberry Pi3, and the host OS within the Pi3 device is Windows 10 IoT core. Being a minified version of the core, Windows 10 OS works hassle free. Because the development environment is the same, Visual Studio 2015, we can deploy the app to other sets of devices, too. Our idea when we develop an app should be to keep requirements minimal so that it can be deployed across all platforms. Restricting API access or including different functionality will not allow the app to work freely across different devices.

Making a Simple Hello World App with Visual Studio 2015

First, open Visual Studio 2015. Click File, then select New Project, Templates, JavaScript, Windows, Universal, and WinJS. Name the project app1, as shown in Figure 6-4. Click OK to continue.



New Project

Blank App (Universal Windows)	JavaScript
Blank App - Web Context (Universal Windows)	JavaScript
Hosted Web App (Universal Windows)	JavaScript
WinJS App (Universal Windows)	JavaScript

Type: JavaScript

A project for a Universal Windows app using WinJS. Has direct access to all Universal Windows APIs.

Click here to go online and find templates.

Name: App1

Location: F:\CLI\

Solution: Create new solution

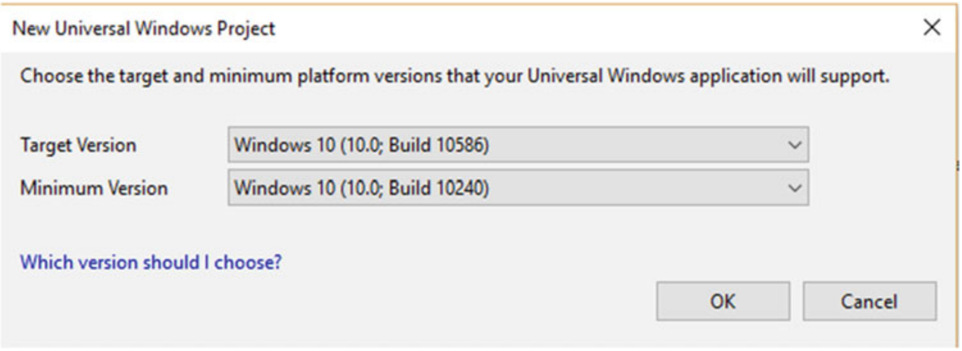
Solution name: App1

☑ Create directory for solution

□ Add to Source Control

Figure 6-4. *UWP app using WinJS*

The next option we have is for targeting Windows 10 versions, as shown in Figure 6-5. Select a different version or keep this setting as it is, and then click OK.



New Universal Windows Project

Choose the target and minimum platform versions that your Universal Windows application will support.

Target Version: Windows 10 (10.0; Build 10586)

Minimum Version: Windows 10 (10.0; Build 10240)

Which version should I choose?

Figure 6-5. *Targeting the version of Windows 10*

Let’s take a look at the file structure of the project in Figure 6-6.

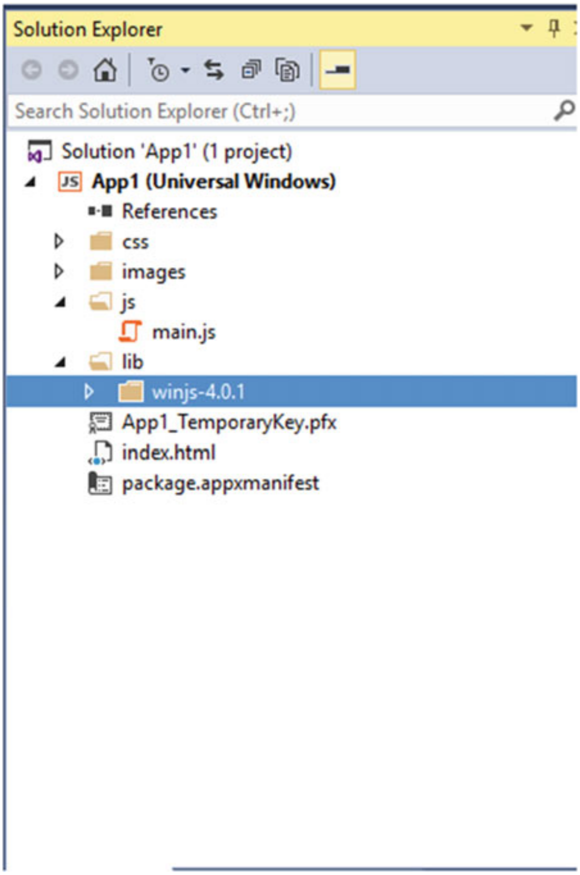


Figure 6-6. *The file structure for the project*

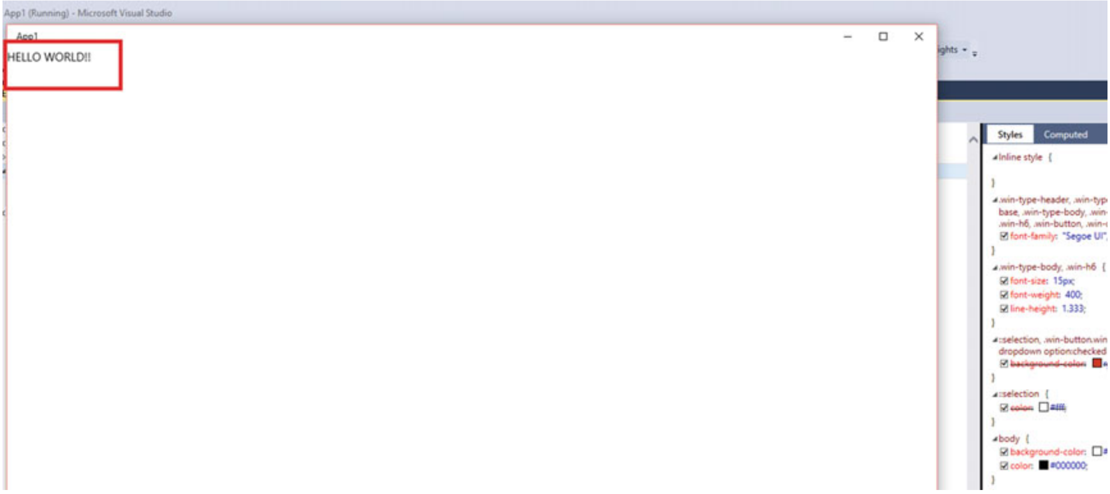
The most important file shown is the `main.js` file, which handles all the logic for Windows 10 activities. Together with the WinJS file, this file also binds the project. Within the `index.html` page, we include a Hello World within the body tag. Listing 6-1 shows the code part at `index.html`. This is the main page where we include JavaScript libraries.

Listing 6-1. The Coding Construct `index.html` Page

```
<!DOCTYPE html>
<html>
<head>
    <meta charset="utf-8" />
    <title>App1</title>
    <link href="lib/winjs-4.0.1/css/ui-light.css" rel="stylesheet" />
    <script src="lib/winjs-4.0.1/js/base.js"></script>
    <script src="lib/winjs-4.0.1/js/ui.js"></script>
    <link href="css/default.css" rel="stylesheet" />
    <script src="js/main.js"></script>
</head>
<body class="win-type-body">
```

```
    <div>HELLO WORLD!!</div>
</body>
</html>
```

Figure 6-7 shows the output when you run the program.Universal Windows Platform (UWP):devices:



```
◢Inline style {

}
◢.win-type-header, .win-typ
 base, .win-type-body, .win-
 .win-h6, .win-button, .win-
  ☑ font-family: "Segoe UI",
}
◢.win-type-body, .win-h6 {
  ☑ font-size: 15px;
  ☑ font-weight: 400;
  ☑ line-height: 1.333;
}
◢::selection, .win-button.win
 dropdown option:checked
  ☑ ~~background-color:~~ 🟥
}
◢::selection {
  ☑ ~~color:~~ □ ~~#fff;~~
}
◢body {
  ☑ background-color: □
  ☑ color: ■ #000000;
}
```

Figure 6-7. *The output for the program*

WinJS

WinJS is an open source JavaScript library that helps us to build HTML5, Cascading Style Sheet (CSS), and JavaScript applications for Windows Store with a consistent look and performance across all Windows devices. It's a boon for Windows 10 to use one API across all devices. The flow of WinJS is shown in Figure 6-8.

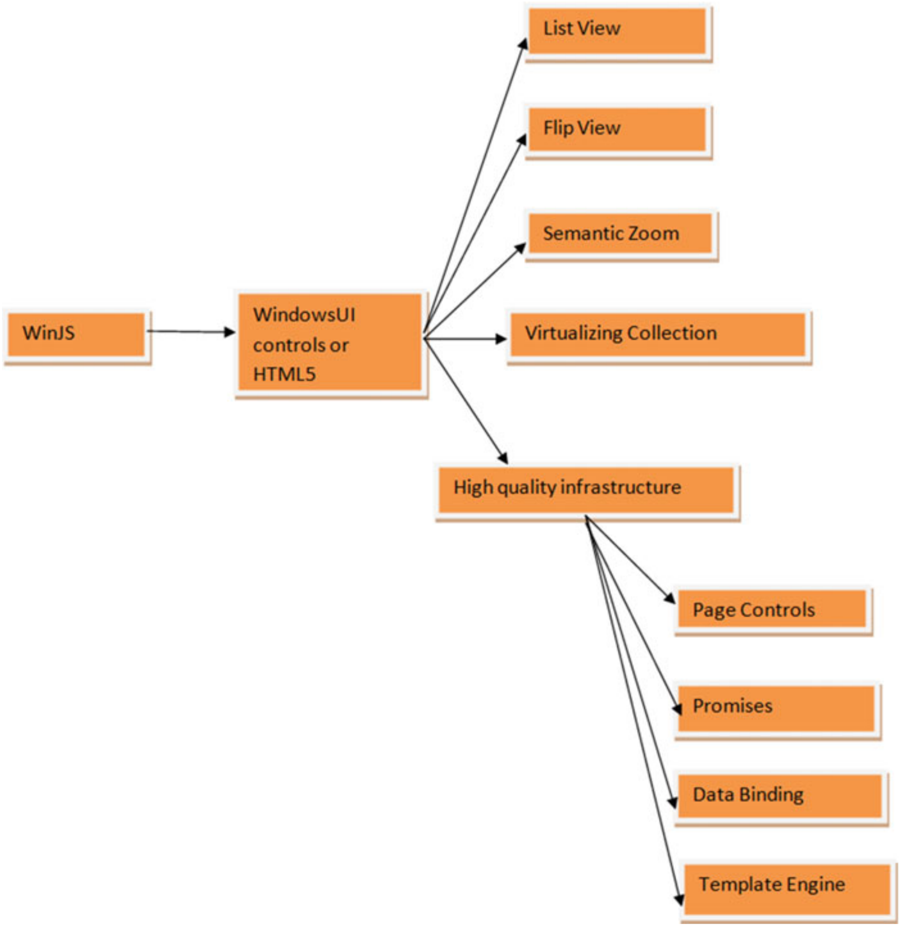


Figure 6-8. *WinJS flow*

Processing JS

As the name suggests, Processing JS (Figure 6-9) is a JavaScript port of the Processing language. With the booming web development scenario it is expected that it could be extended to HTML5 and JavaScript. It has the same ability to represent visual art forms in terms of coding with the additional capability of JavaScript bundled with the language support. The logic works this way: We write code in the Processing language, include it in a web page, and Processing JS performs the transformation, giving us the output.

Figure 6-9. *Processing JS*

Including the Processing JS library

We can target the development scenario in the `index.html` page when we add the Processing JS file to the header section of the web page.

Within the body tag, we need to add reference to the Processing (`*.pde`) script within the canvas tag and adddata-processing sources' attributes.

How Processing JS Works

When the extension was created, it was essential to know how the parsing happens from Processing language to Processing JS. Within the canvas, Processing scans the document with the data-processing sources' attributes, downloads the files using XMLHTTP Request, and finally turns it to the best usage as per JavaScript (see Figure 6-10).

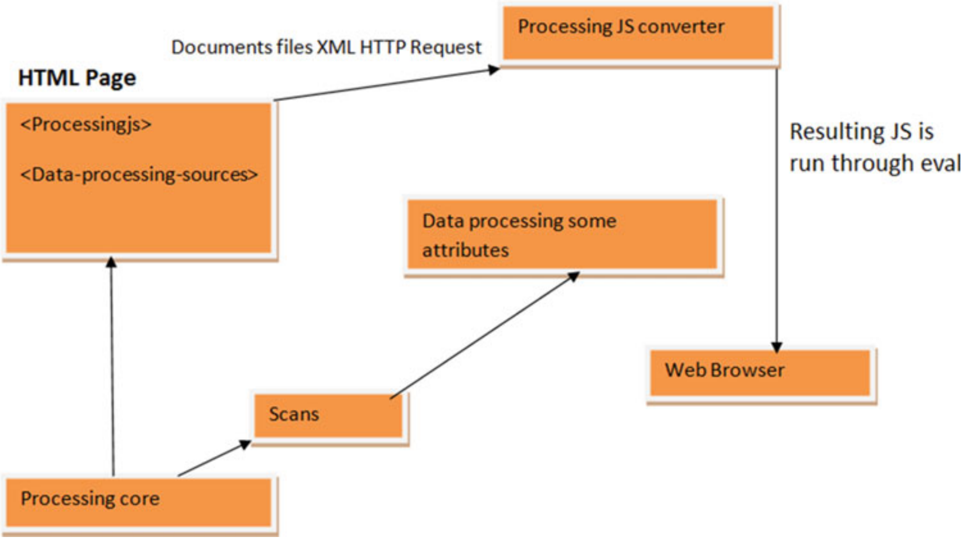
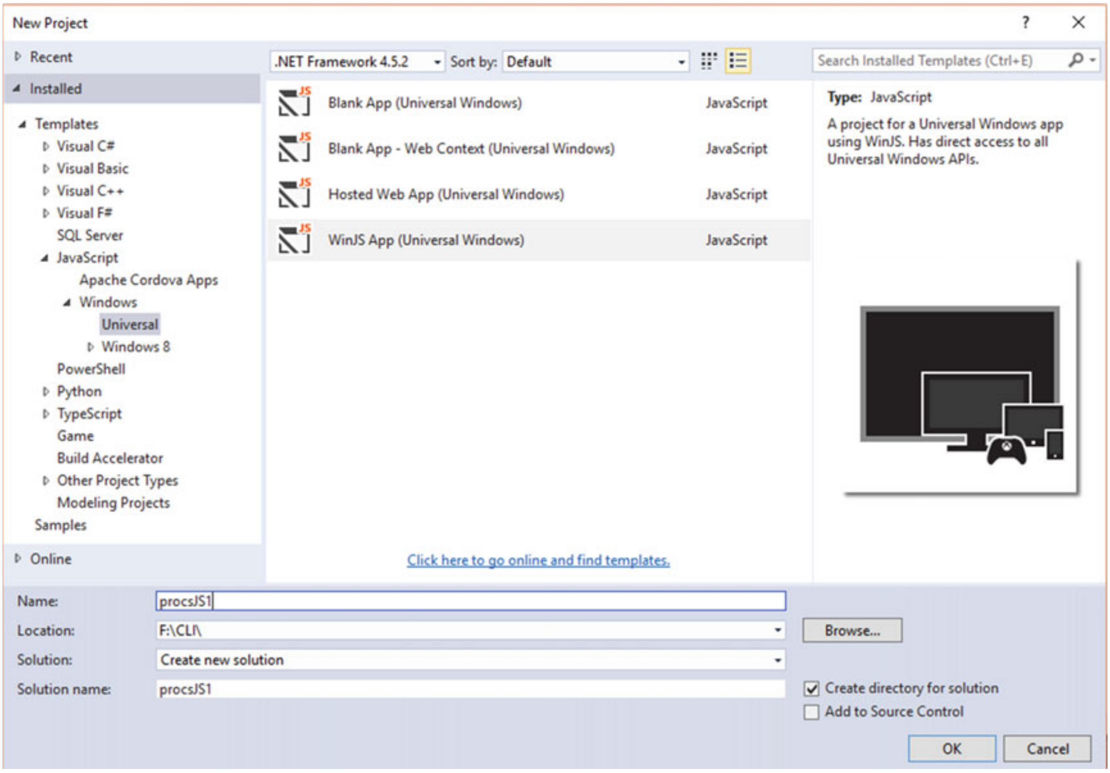

Documents files XML HTTP Request
Processing JS converter
HTML Page
<Processingjs>
<Data-processing-sources>
Resulting JS is run through eval
Data processing some attributes
Web Browser
Scans
Processing core

Figure 6-10. *Processing JS working structure*

Processing JS and Windows 10 UWP

This is the most important part of this chapter, where we include the concepts of creative coding and Processing JS and bring them to Windows 10 UWP apps. Now that you have grasped the concept of core Processing with respect to JavaScript, we can extend it to build Windows 10 UWP apps. Let's start.

Open Visual Studio 2015, then click File and select New Project. Create a Windows 10 UWP project that is WinJS based (see Figure 6-11).



Type: JavaScript

A project for a Universal Windows app using WinJS. Has direct access to all Universal Windows APIs.

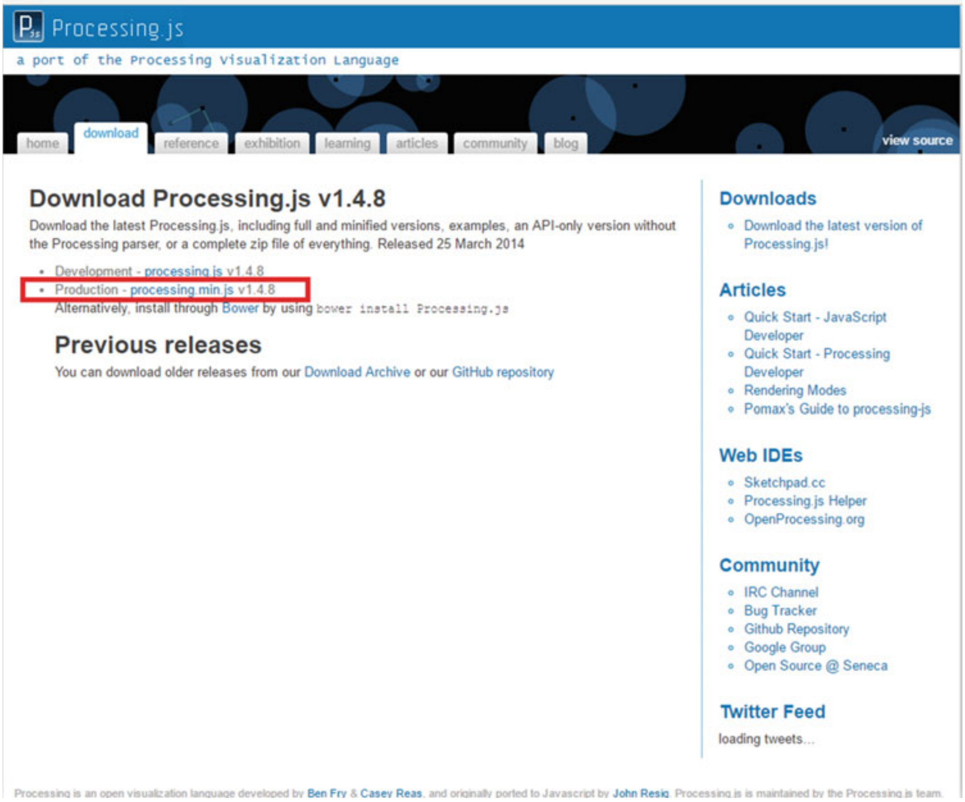
Name:	procsJS1
Location:	F:\CLI\
Solution:	Create new solution
Solution name:	procsJS1

☑ Create directory for solution

□ Add to Source Control

Figure 6-11. *Processing JS UWP app creation*

Next you need to download the Processing JS file and then include it in the project (see Figure 6-12).



Download Processing.js v1.4.8

Download the latest Processing.js, including full and minified versions, examples, an API-only version without the Processing parser, or a complete zip file of everything. Released 25 March 2014

- Development - processing.js v1.4.8
- Production - processing.min.js v1.4.8

Alternatively, install through Bower by using `bower install Processing.js`

Previous releases

You can download older releases from our Download Archive or our GitHub repository

Downloads

- Download the latest version of Processing.js!

Articles

- Quick Start - JavaScript Developer
- Quick Start - Processing Developer
- Rendering Modes
- Pomax's Guide to processing-js

Web IDEs

- Sketchpad.cc
- Processing.js Helper
- OpenProcessing.org

Community

- IRC Channel
- Bug Tracker
- Github Repository
- Google Group
- Open Source @ Seneca

Twitter Feed

loading tweets...

Processing is an open visualization language developed by Ben Fry & Casey Reas, and originally ported to Javascript by John Resig. Processing.js is maintained by the Processing.js team.

Figure 6-12. *Downloading Processing JS*

Select the version you want or leave the default selection intact, then copy and paste the Processing JS file into the JS folder of the project, as shown in Figure 6-13.

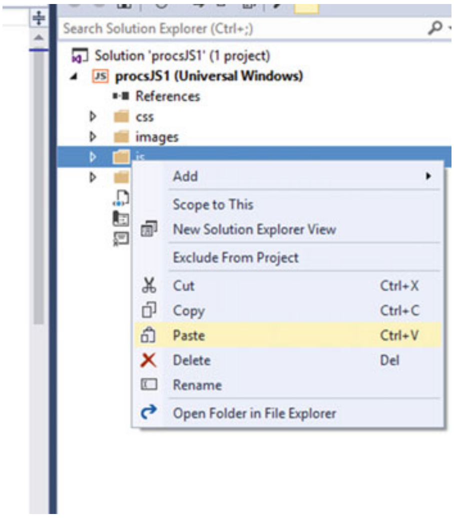

Search Solution Explorer (Ctrl+;)
Solution 'procsJS1' (1 project)
procsJS1 (Universal Windows)
References
css
images
js
Add
Scope to This
New Solution Explorer View
Exclude From Project
Cut Ctrl+X
Copy Ctrl+C
Paste Ctrl+V
Delete Del
Rename
Open Folder in File Explorer

Figure 6-13. *Copy and paste the Processing JS file*

Next, create a folder, as demonstrated in Figure 6-14. Name the folder PDE and store the Processing file.

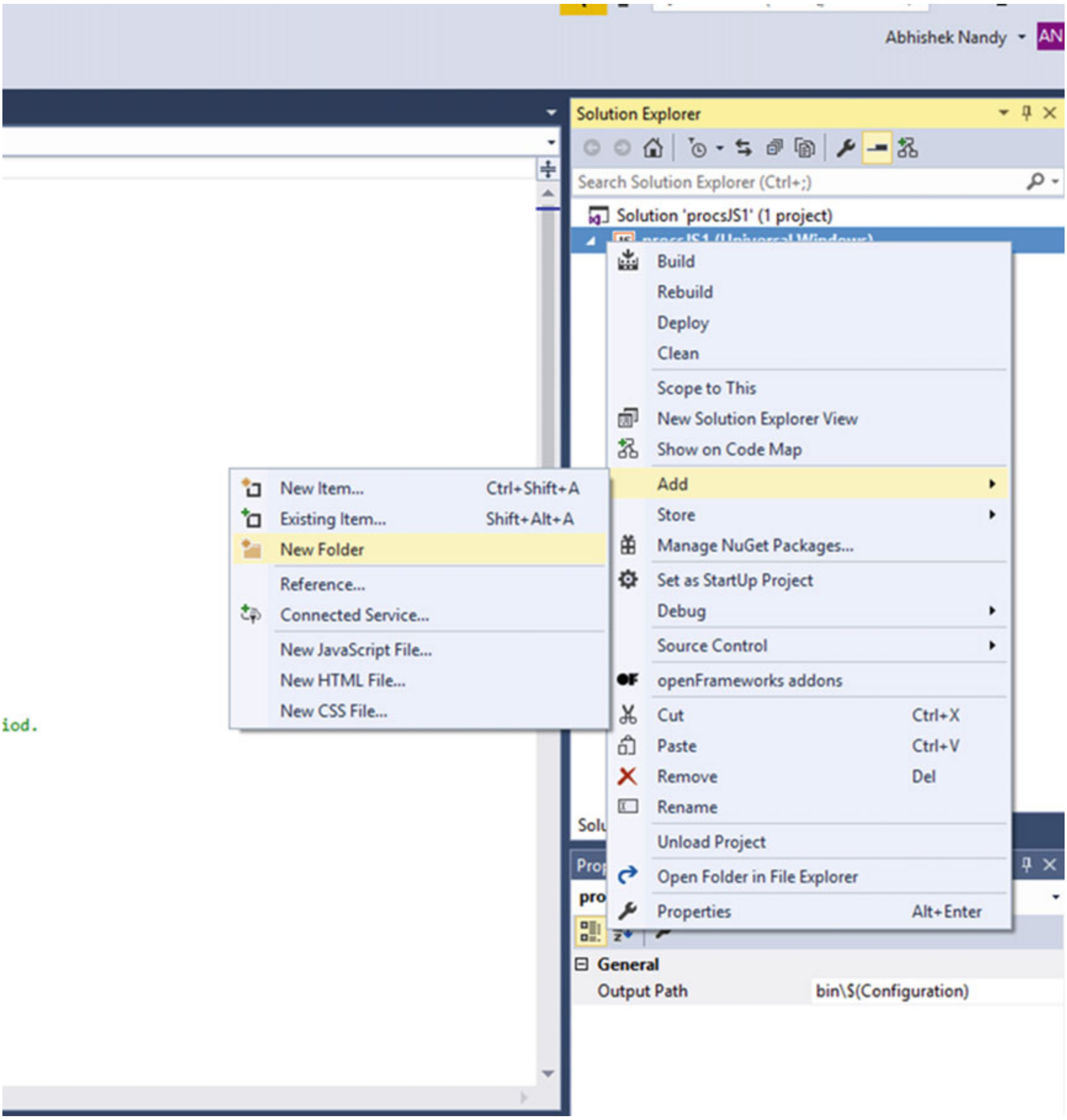


Figure 6-14. *Creating a new folder*

Next, start coding for the pde file. Let's try some simple code. The Processing code in Listing 6-2 allows a circle and a rectangle to move by mouse click.

Listing 6-2. Code for the Processing File

```
float x, y;
float dim = 80.0;

void setup() {
  size(1024, 768);
  noStroke();
}

void draw() {
  background(102);

  x = x + 0.8;

  if (x > width + dim) {
    x = -dim;
  }
  float X =mouseX-dim/2;
  float Dim =dim*mouseX;

  translate(x, height/2-dim/2);
  fill(255);
  ellipse(X, X, Dim, Dim);

  // Transforms accumulate. Notice how this rect moves
  // with mouse click
  // parameter for the x-axis value
  translate(x, dim);
  fill(0);
  rect(X,X, Dim, Dim);
}
```

Now you need to add the Processing JS file within the `index.html` page and then add the data-processing option and include the path to the folder where the Processing file is kept. The code inside the `index.html` page looks like Listing 6-3.

Listing 6-3. The Coding at `index.html` Page

```
<!DOCTYPE html>
<html>
<head>
    <meta charset="utf-8" />
    <title>procsJS1</title>
    <link href="lib/winjs-4.0.1/css/ui-light.css" rel="stylesheet" />
    <script src="lib/winjs-4.0.1/js/base.js"></script>
    <script src="lib/winjs-4.0.1/js/ui.js"></script>
    <link href="css/default.css" rel="stylesheet" />
    <script src="js/main.js"></script>
    <script src="js/processing.min.js"></script>
</head>
<body class="win-type-body">
    <canvas id="sketch" data-processing-sources="pde/move.pde"></canvas>
</body>
</html>
```

Let's run the app now. Figure 6-15 shows the app as it runs.

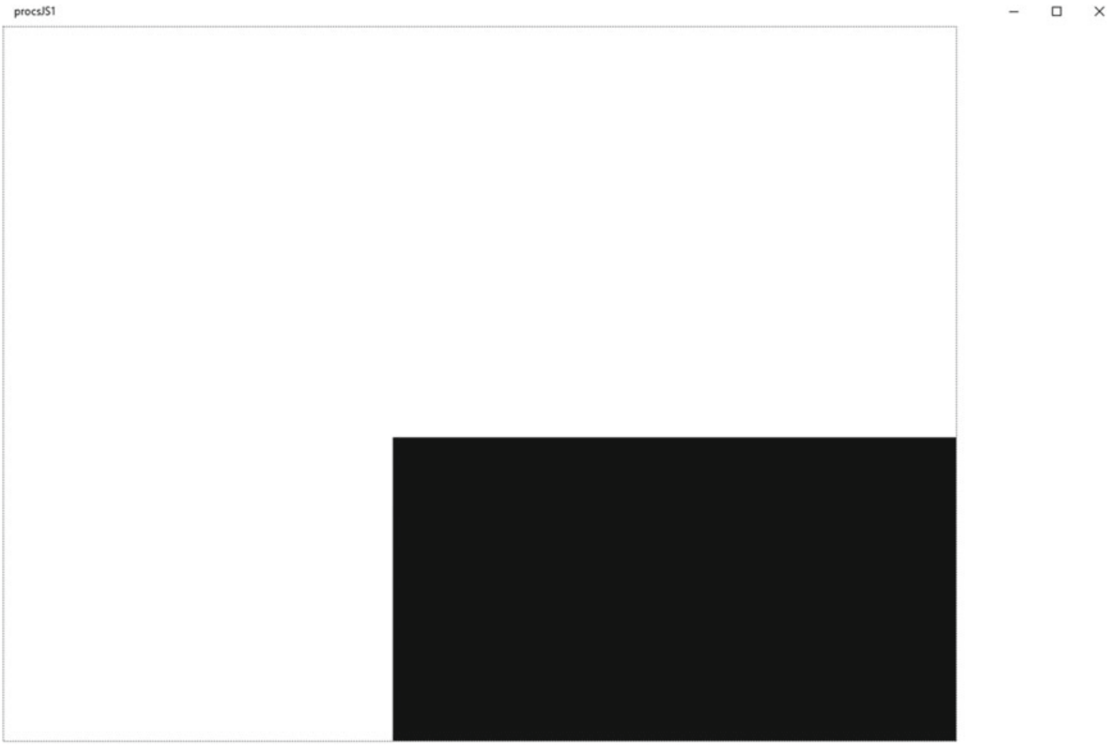


Figure 6-15. *The app runs and works well*

A Painting Processing JS App

We next create a painting app that works with mouse movements; that is, we will be using mouseX (Processing tracks mouse movements when the mouse cursor is across the screen area). We name the app ProcessingJS2. The steps performed for creating the project remain the same as those we have followed before.

The code for drawing the pattern is shown in Listing 6-4. It uses mouseX, mouseY, pmouseX, and pmouseY to draw lines.

Listing 6-4. The Code for the Drawing App

```
float d, dt;
void setup() {
  background (240,240,240);
  size(1000, 800);
  smooth();
  strokeWeight(0);
}
void draw() {
  d=dist( mouseX, mouseY, pmouseX, pmouseY);
  dt=map(sin(d),-1,1, 2, 4);
  print(dt);
if(mousePressed==true){
  stroke(180,0,0,180);
  strokeWeight(4+dt/2);
 line(mouseX, mouseY, pmouseX, pmouseY);

 stroke(90,90,0,180);
 strokeWeight((4+dt/2)/2);
line(mouseX+(4+dt/2)/2, mouseY-(4+dt/2)/2, pmouseX+(4+dt/2)/2, pmouseY-(4+dt/2)/2);

 stroke(0,180,0,180);
 strokeWeight(4+dt/2);
line(mouseX+(4+dt/2), mouseY-(4+dt/2), pmouseX+(4+dt/2), pmouseY-(4+dt/2));

stroke(0,90,90,180);
strokeWeight((4+dt/2)/2);
line(mouseX-(4+dt/2)/2, mouseY+(4+dt/2)/2, pmouseX-(4+dt/2)/2, pmouseY+(4+dt/2)/2);

stroke(0,0,180,180);
strokeWeight(4+dt/2);
line(mouseX-(4+dt/2), mouseY+(4+dt/2), pmouseX-(4+dt/2), pmouseY+(4+dt/2));

  }

}
```

When you run the app, the output will look something like Figure 6-16.

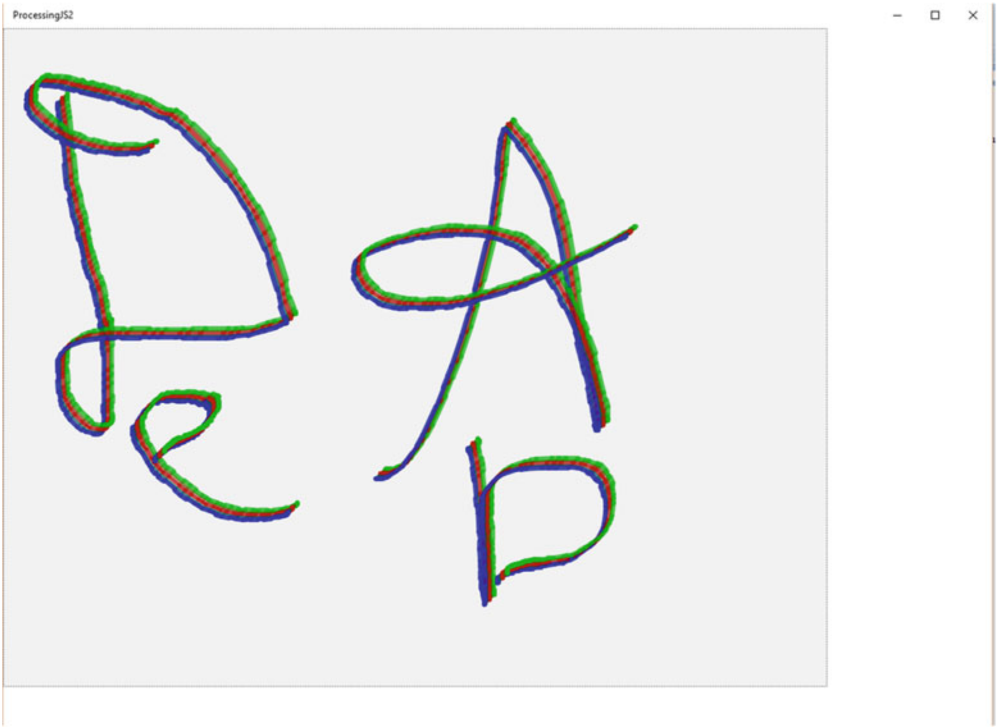
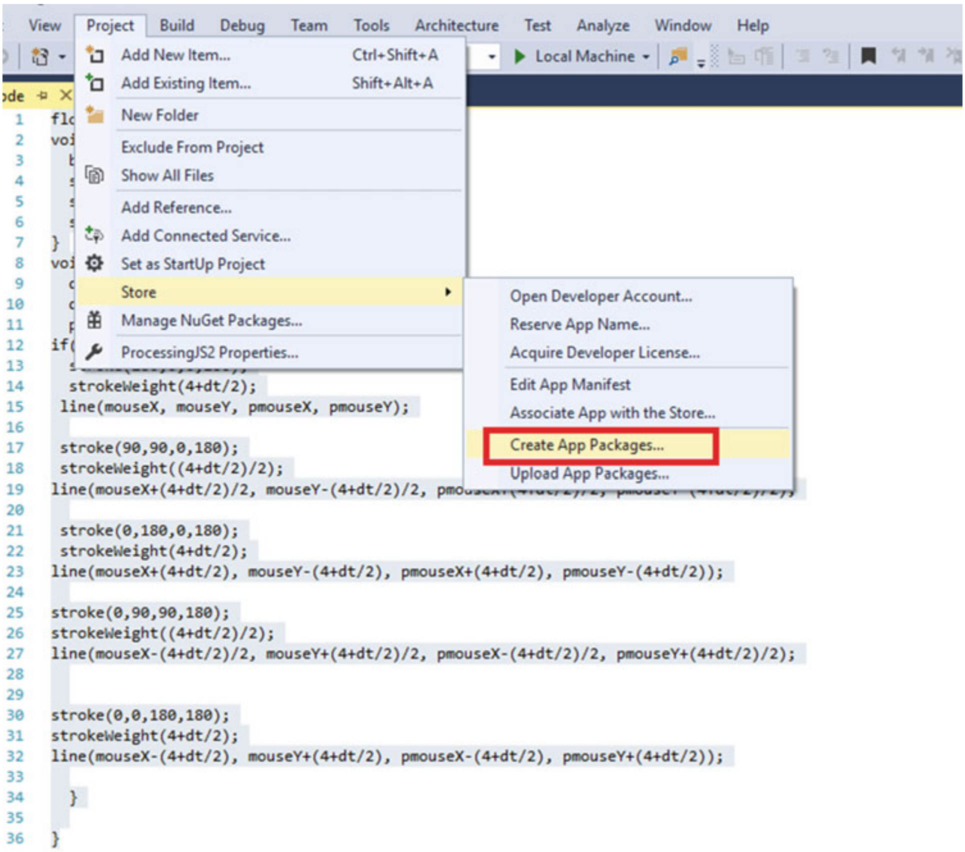


Figure 6-16. Running the app to allow drawing

Let’s create an app package for the application you just created to validate that the Processing JS app runs perfectly and creates a successful Windows 10 UWP package.

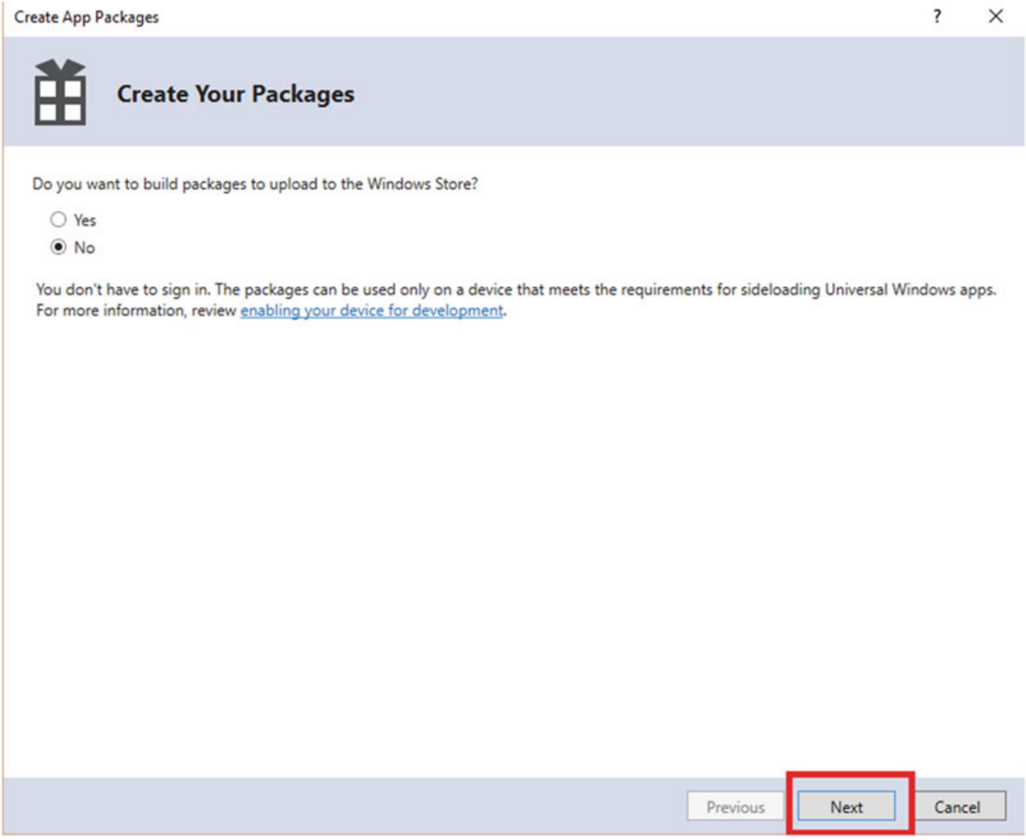
Click Project, then select Store and click Create App Packages, as highlighted in Figure 6-17.



```
flo
voi
  
  
  
  
}
voi
  
  
  
if(
  
  strokeWeight(4+dt/2);
 line(mouseX, mouseY, pmouseX, pmouseY);

 stroke(90,90,0,180);
 strokeWeight((4+dt/2)/2);
line(mouseX+(4+dt/2)/2, mouseY-(4+dt/2)/2, pmo

 stroke(0,180,0,180);
 strokeWeight(4+dt/2);
line(mouseX+(4+dt/2), mouseY-(4+dt/2), pmouseX+(4+dt/2), pmouseY-(4+dt/2));

stroke(0,90,90,180);
strokeWeight((4+dt/2)/2);
line(mouseX-(4+dt/2)/2, mouseY+(4+dt/2)/2, pmouseX-(4+dt/2)/2, pmouseY+(4+dt/2)/2);


stroke(0,0,180,180);
strokeWeight(4+dt/2);
line(mouseX-(4+dt/2), mouseY+(4+dt/2), pmouseX-(4+dt/2), pmouseY+(4+dt/2));

  }

}
```

Figure 6-17. *Creating a package for the app*

The Create App Package Wizard opens. You will not push the app to the Windows Store, so select No, and then click Next, as shown in Figure 6-18.



Create App Packages

Create Your Packages

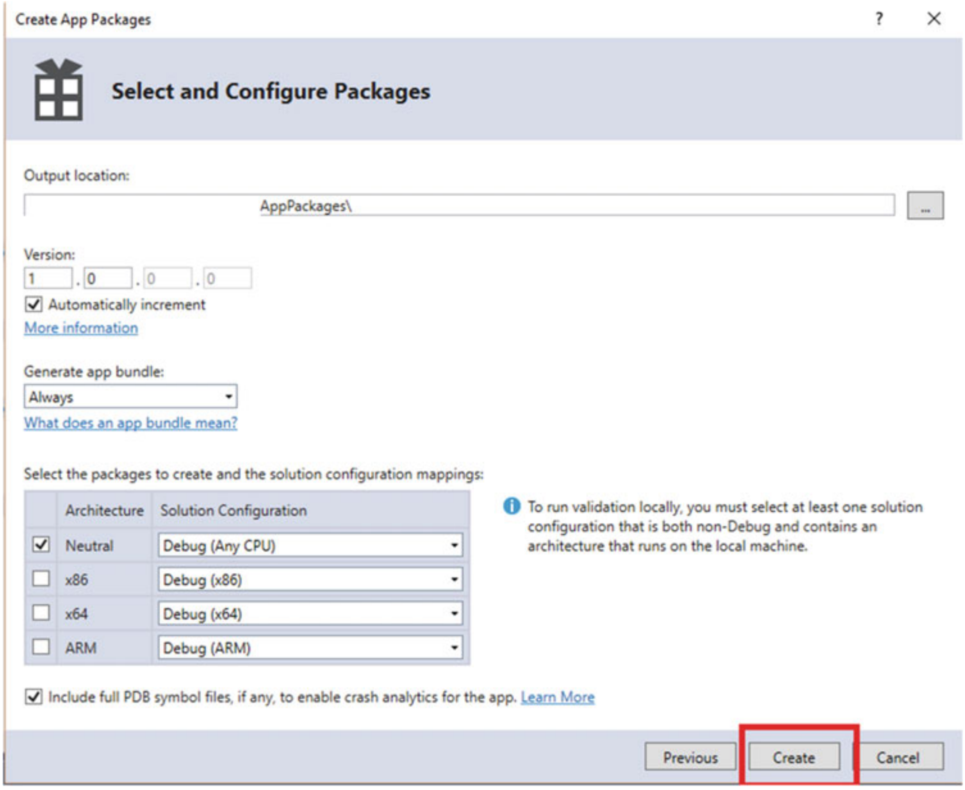
Do you want to build packages to upload to the Windows Store?

○ Yes
● No

You don't have to sign in. The packages can be used only on a device that meets the requirements for sideloading Universal Windows apps. For more information, review enabling your device for development.

Figure 6-18. *The Create App Packages Wizard*

The next wizard page gives you the option to configure the app package. Leave the settings as shown, and click Create, as shown in Figure 6-19.



Create App Packages

Select and Configure Packages

Output location: AppPackages\

Version: 1 . 0 . 0 . 0

☑ Automatically increment

More information

Generate app bundle: Always

What does an app bundle mean?

Select the packages to create and the solution configuration mappings:

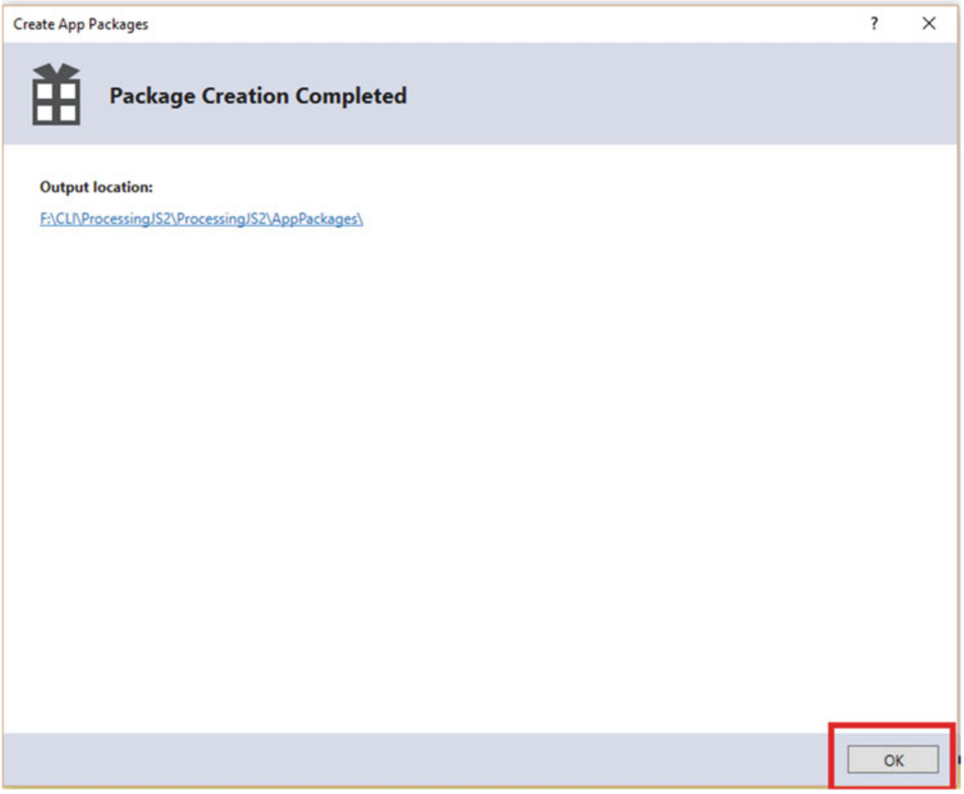
	Architecture	Solution Configuration
☑	Neutral	Debug (Any CPU)
□	x86	Debug (x86)
□	x64	Debug (x64)
□	ARM	Debug (ARM)

To run validation locally, you must select at least one solution configuration that is both non-Debug and contains an architecture that runs on the local machine.

☑ Include full PDB symbol files, if any, to enable crash analytics for the app. Learn More

Figure 6-19. *Configuring and creating an app package*

On the final page of the wizard, shown in Figure 6-20, you can see that the app package has been created.



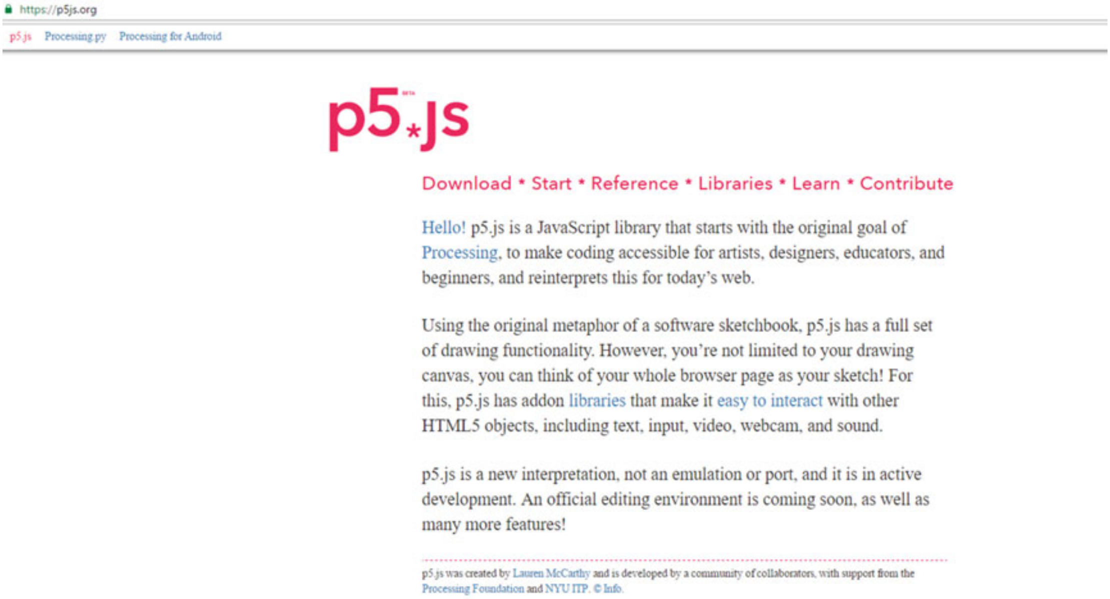
Output location:
F:\CLI\ProcessingJS2\ProcessingJS2\AppPackages\

Figure 6-20. *The app package is created*

The experiment with Processing JS and Windows 10 UWP has succeeded and you are ready to create more apps for the Windows Store. You can take our imagination soaring and create creative coding apps for the store.

P5.js

P5.js (Figure 6-21) is a pure JavaScript version of the Processing language, so we don't have use any different technique to get the code going. We write the code for Processing in JavaScript.


https://p5js.org
p5.js Processing.py Processing for Android
p5.js
Download * Start * Reference * Libraries * Learn * Contribute

Hello! p5.js is a JavaScript library that starts with the original goal of Processing, to make coding accessible for artists, designers, educators, and beginners, and reinterprets this for today's web.

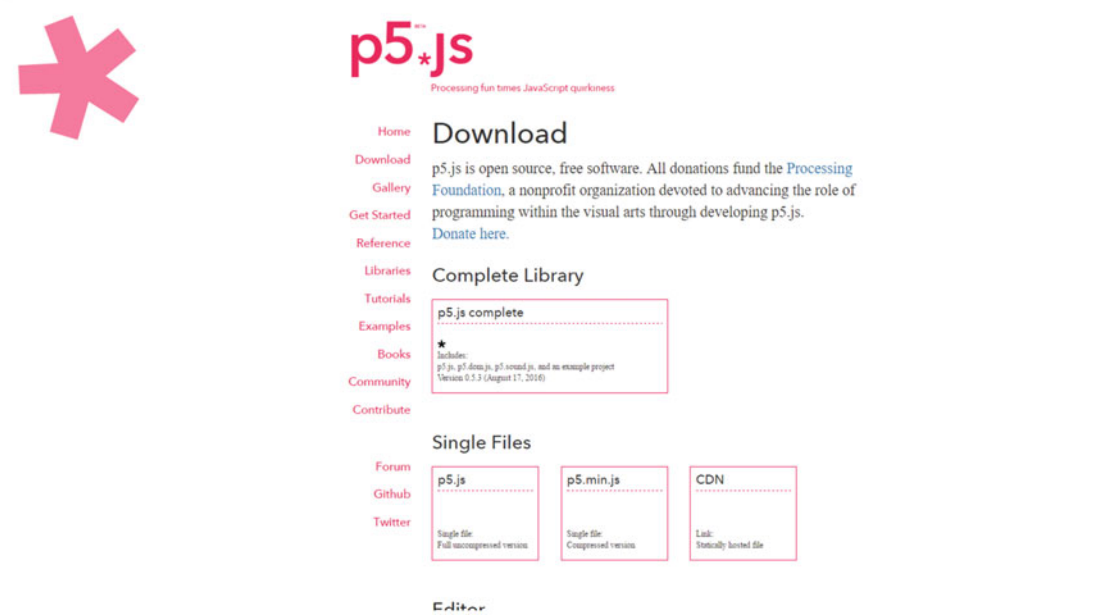
Using the original metaphor of a software sketchbook, p5.js has a full set of drawing functionality. However, you're not limited to your drawing canvas, you can think of your whole browser page as your sketch! For this, p5.js has addon libraries that make it easy to interact with other HTML5 objects, including text, input, video, webcam, and sound.

p5.js is a new interpretation, not an emulation or port, and it is in active development. An official editing environment is coming soon, as well as many more features!

p5.js was created by Lauren McCarthy and is developed by a community of collaborators, with support from the Processing Foundation and NYU ITP. © Info.

Figure 6-21. *The P5.js web site*

First we need to download the P5.js library that we need to include in the project. The details of the download page are shown in Figure 6-22.



Download

p5.js is open source, free software. All donations fund the Processing Foundation, a nonprofit organization devoted to advancing the role of programming within the visual arts through developing p5.js. Donate here.

Complete Library

p5.js complete

★
Includes:
p5.js, p5.dom.js, p5.sound.js, and an example project
Version 0.5.3 (August 17, 2016)

Single Files

p5.js
Single file:
Full uncompressed version

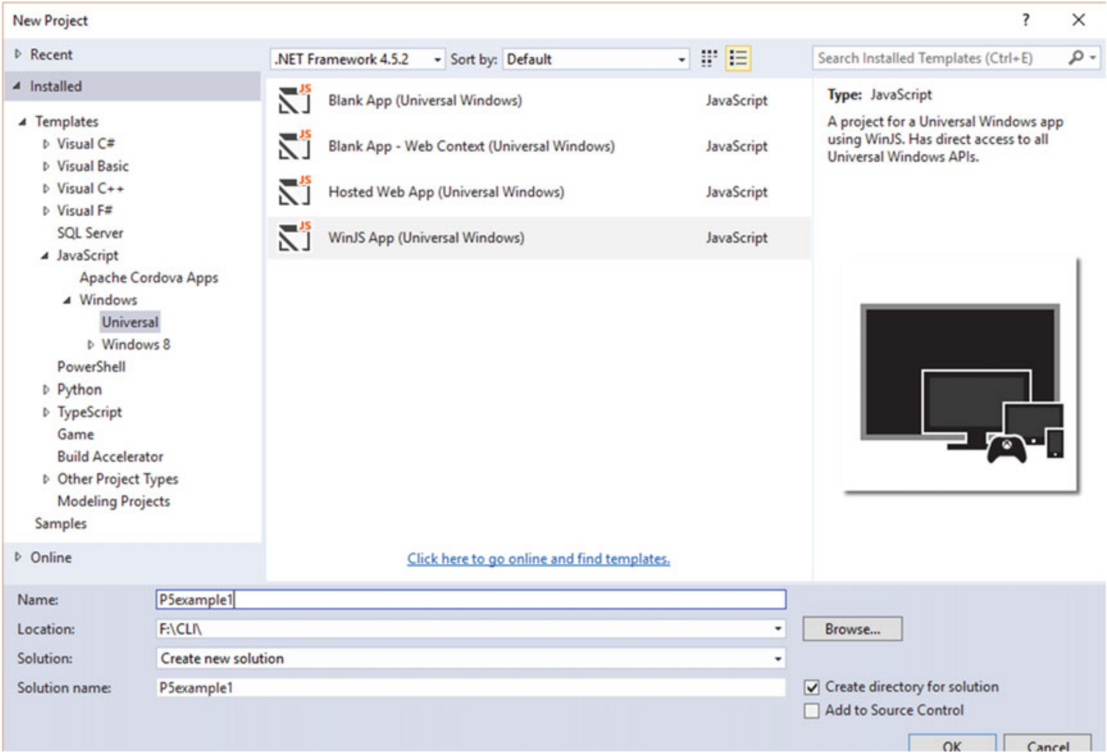
p5.min.js
Single file:
Compressed version

CDN
Link:
Statically hosted file

Editor

Figure 6-22. *Downloading the p5.js complete library*

Open a new project in Visual Studio 2015. Select the UWP and then the WinJS template, as we have done before. The result is shown in Figure 6-23.



New Project

- ▷ Recent
- ◢ Installed
  - ◢ Templates
    - ▷ Visual C#
    - ▷ Visual Basic
    - ▷ Visual C++
    - ▷ Visual F#
    - SQL Server
    - ◢ JavaScript
      - Apache Cordova Apps
      - ◢ Windows
        - Universal
        - ▷ Windows 8
    - PowerShell
    - ▷ Python
    - ▷ TypeScript
    - Game
    - Build Accelerator
    - ▷ Other Project Types
    - Modeling Projects
  - Samples
- ▷ Online

.NET Framework 4.5.2 | Sort by: Default | Search Installed Templates (Ctrl+E)

Blank App (Universal Windows)	JavaScript
Blank App - Web Context (Universal Windows)	JavaScript
Hosted Web App (Universal Windows)	JavaScript
WinJS App (Universal Windows)	JavaScript

Type: JavaScript

A project for a Universal Windows app using WinJS. Has direct access to all Universal Windows APIs.

Click here to go online and find templates.

Name: P5example1

Location: F:\CLI\

Solution: Create new solution

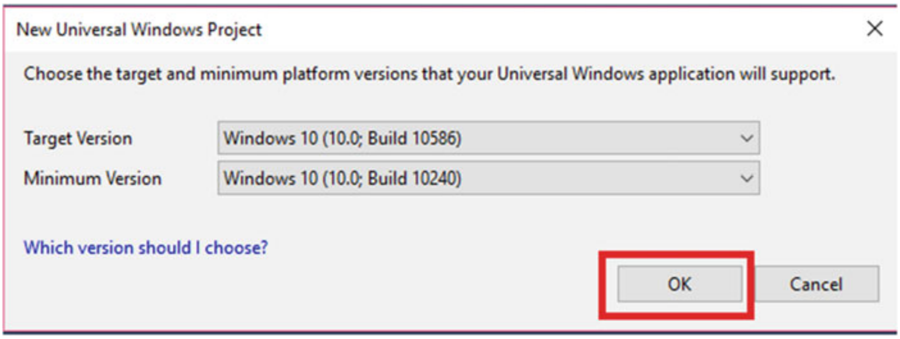
Solution name: P5example1

☑ Create directory for solution

□ Add to Source Control

Figure 6-23. Creating a UWP app

Keep the platform version as it is, the way we have done before, and then click OK, as highlighted in Figure 6-24.



New Universal Windows Project

Choose the target and minimum platform versions that your Universal Windows application will support.

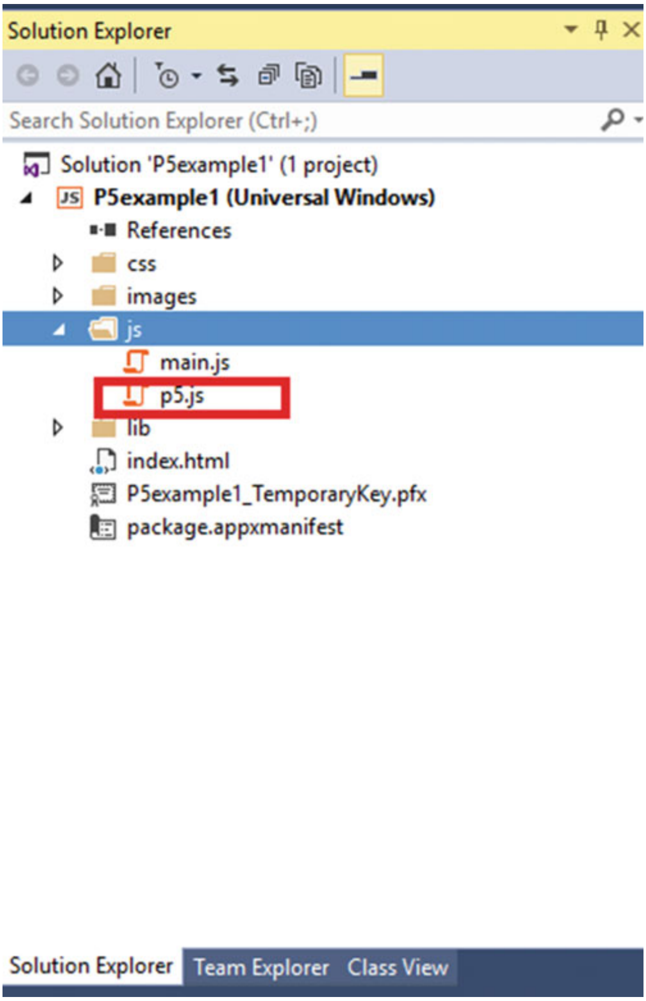
Target Version: Windows 10 (10.0; Build 10586)

Minimum Version: Windows 10 (10.0; Build 10240)

Which version should I choose?

Figure 6-24. Click OK for new project

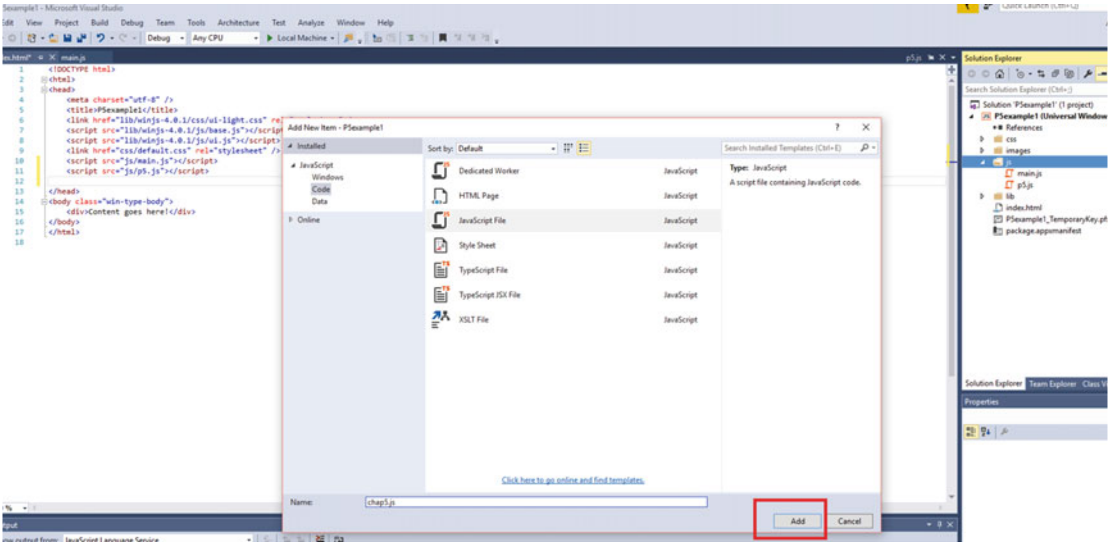
You need to copy the `p5.js` file to the JS folder, as shown in Figure 6-25. Once the file is copied, it helps in implementing Processing logic.



Solution Explorer
Search Solution Explorer (Ctrl+;)
Solution 'P5example1' (1 project)
P5example1 (Universal Windows)
References
css
images
js
main.js
p5.js
lib
index.html
P5example1_TemporaryKey.pfx
package.appxmanifest
Solution Explorer
Team Explorer
Class View

Figure 6-25. *The `p5.js` file in the JS folder*

Now you have to include the `p5.js` file within the `index.html` page. Create one JS file, as depicted in Figure 6-26, where we will be writing the code logic to get going with Processing.


Sexample1 - Microsoft Visual Studio
Edit View Project Build Debug Team Tools Architecture Test Analyze Window Help
Debug
Any CPU
Local Machine
es.html* main.js
p5.js
Solution Explorer
Search Solution Explorer (Ctrl+;)
Solution 'P5example1' (1 project)
P5example1 (Universal Window
References
css
images
js
main.js
p5.js
lib
index.html
P5example1_TemporaryKey.pf
package.appxmanifest
Solution Explorer Team Explorer Class V
Properties
Add New Item - P5example1
Installed
JavaScript
Windows
Code
Data
Online
Sort by: Default
Search Installed Templates (Ctrl+E)
Dedicated Worker JavaScript
HTML Page JavaScript
JavaScript File JavaScript
Style Sheet JavaScript
TypeScript File JavaScript
TypeScript JSX File JavaScript
XSLT File JavaScript
Click here to go online and find templates.
Add
Cancel

```
<!DOCTYPE html>
<html>
<head>
    <meta charset="utf-8" />
    <title>P5example1</title>
    <link href="lib/winjs-4.0.1/css/ui-light.css" rel
    <script src="lib/winjs-4.0.1/js/base.js"></scrip
    <script src="lib/winjs-4.0.1/js/ui.js"></script>
    <link href="css/default.css" rel="stylesheet" />
    <script src="js/main.js"></script>
    <script src="js/p5.js"></script>

</head>
<body class="win-type-body">
    <div>Content goes here!</div>
</body>
</html>
```

Type: JavaScript
A script file containing JavaScript code.

Name: chap5.js

Figure 6-26. *Adding the JS file*

The functions are the same: We have the `setup()` and `draw()` functions, which we have used in Processing. Hence, we see that the entire logic resembles that of Processing. Let's take a look at the code in Listing 6-5, which allows us to interact with the balls that appear close to the rectangle with the mouse. We have used `mouseX`, `mouseY` utility of Processing all in core JavaScript.

Listing 6-5. The Code Logic in JS for Processing.

```
var angle1 = 0;
var angle2 = 0;
var scalar = 70;

function setup() {
    createCanvas(1920, 1080);
    noStroke();
    rectMode(CENTER);
}

function draw() {
    background(0);

    var ang1 = radians(angle1);
    var ang2 = radians(angle2);

    var x1 = mouseX + width / 2 + (scalar * cos(ang1));
    var x2 = pmouseX + width / 2 + (scalar * cos(ang2));
    var y1 = mouseY + height / 2 + (scalar * sin(ang1));
    var y2 = pmouseY + height / 2 + (scalar * sin(ang2));

    fill(255);
    rect(width * 0.5, height * 0.5, 140, 140);

    fill(0, 502, 553);
    ellipse(x1, height * 0.5 - 120, scalar, scalar);
    ellipse(x2, height * 0.5 + 120, scalar, scalar);

    fill(655, 604, 0);
    ellipse(width * 0.5 - 120, y1, scalar, scalar);
    ellipse(width * 0.5 + 120, y2, scalar, scalar);

    angle1 += 2;
    angle2 += 3;
}
```

The `index.html` file after adding `chap5.js` looks like Listing 6-6.

Listing 6-6. The `index.html` Page

```
<!DOCTYPE html>
<html>
<head>
    <meta charset="utf-8" />
    <title>P5example1</title>
    <link href="lib/winjs-4.0.1/css/ui-light.css" rel="stylesheet" />
    <script src="lib/winjs-4.0.1/js/base.js"></script>
    <script src="lib/winjs-4.0.1/js/ui.js"></script>
    <link href="css/default.css" rel="stylesheet" />
    <script src="js/main.js"></script>
    <script src="js/p5.js"></script>

</head>
<body class="win-type-body">

    <script src="js/chap5.js"></script>
</body>
</html>
```

When you run the app, the output should look like Figure 6-27.

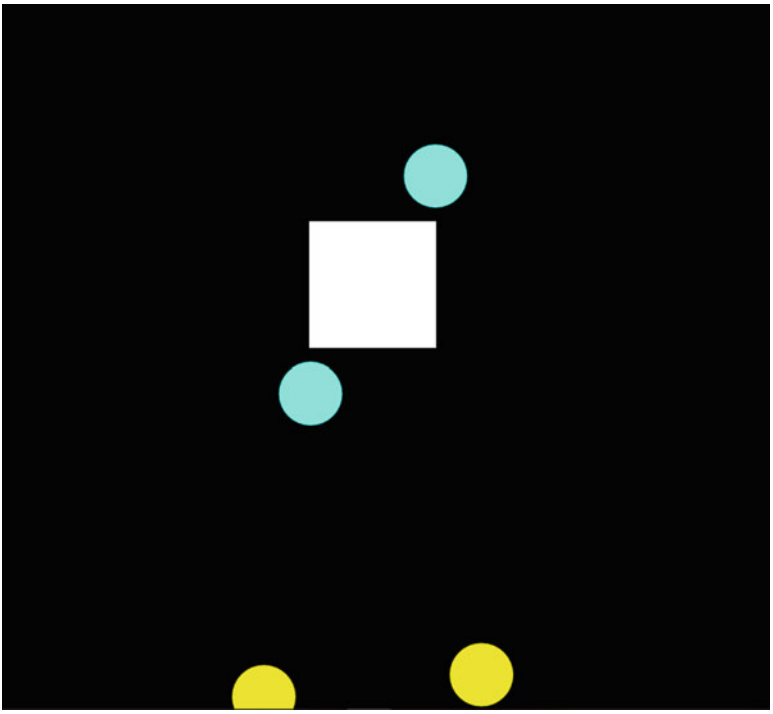


Figure 6-27. *The p5.js app running in Windows 10 UWP Platform*

After these experiments, you can see that Processing can be extended easily to Windows 10 UWP with Processing JS, as well as P5.js, so we have covered a new area in terms of creative coding and Windows 10 UWP. Next we discuss IoT briefly and then extend Processing for IoT with Temboo.

IoT

Any device that has a capability to acquire an IP address can be considered an IoT device. If we have a network where we are connected across numerous devices communicating, sharing information, and working with responses from each other we can say the network has implemented IoT. IoT devices share information via cloud and currently service providers such as Windows Azure, IBM Bluemix, and AWS all offer a different IoT suite for use across these devices.

There are some special boards for usage across different platforms, such as Intel Edison, Intel Joule, Raspberry Pi2, and Raspberry Pi3.

There is a catch with operating systems in these devices, too. The OS is a minified version of the core OS we use in the everyday laptops and PCs that we are using. For Linux, for example, we have Yocto Linux, which is a minified version of the core Linux distribution. The same is true with other Linux kernels, too. For Windows we have a minified version of Windows 10 OS called Windows 10 IoT core.

Security on an IoT device is implemented via IoT gateways, which store or allow communication between different IoT devices while checking the information flow gathered in the IoT gateway and analyzing the headers.

The IoT devices are connected to different sensors to collect data and share across the connected IoT network and also to help in visualizing the data.

Processing IoT and Temboo

Temboo

Temboo is a platform to easily integrate IoT devices and the sensor data across the Web with very simple logic. The Temboo application on the Web looks like Figure 6-28.

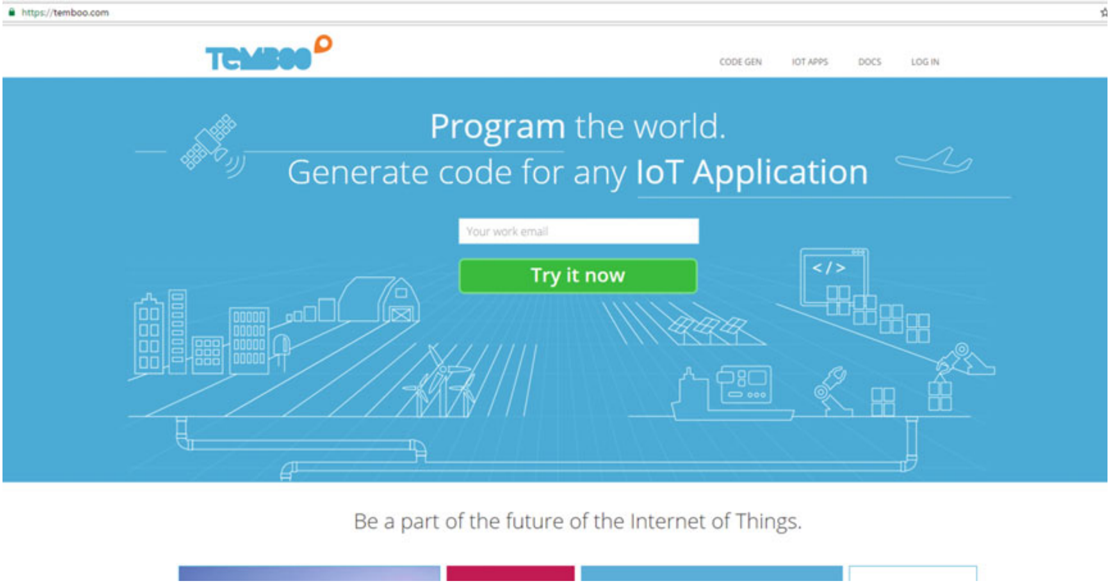


Figure 6-28. *Temboo platform*

Perfect

You will need to enter a user ID and password to log in; otherwise, you will need to create an account.

When you log in, you have the option of choosing from where to learn. For this exercise, choose Processing, as highlighted in Figure 6-29.

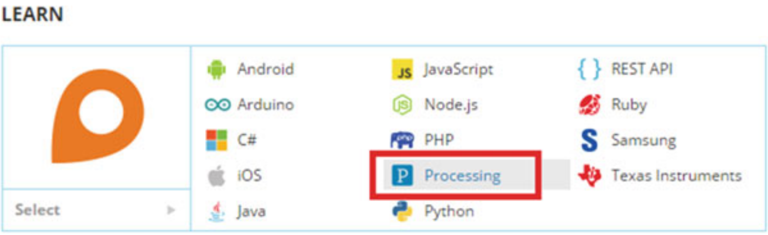


Figure 6-29. *Processing option chosen*

You will then see that the Processing option is enabled in Temboo, as shown in Figure 6-30.

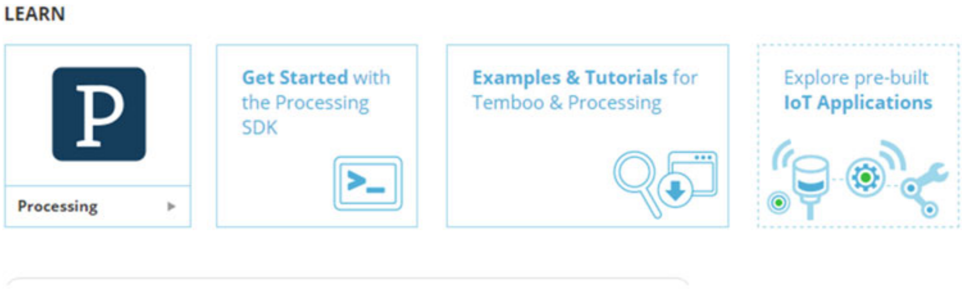
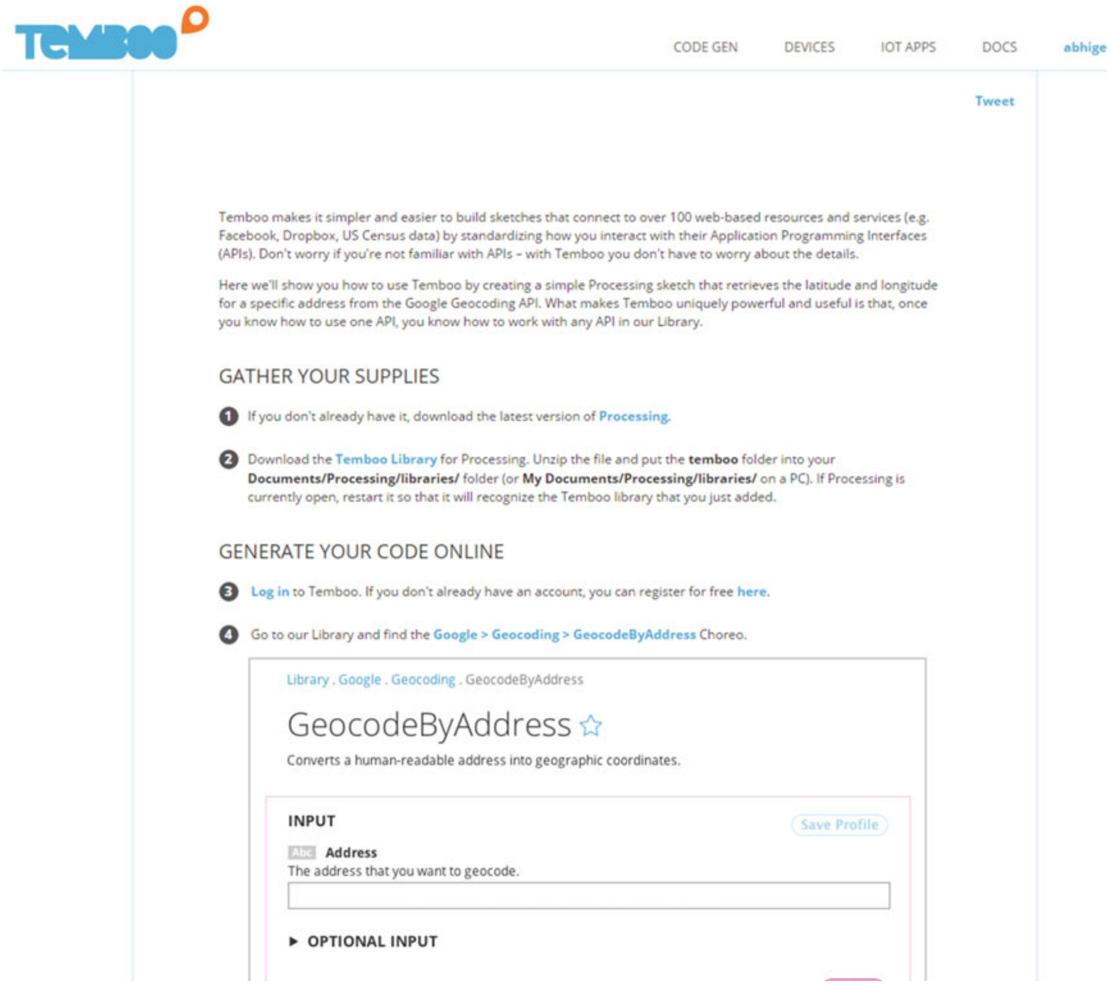

LEARN
P
Processing
Get Started with the Processing SDK
Examples & Tutorials for Temboo & Processing
Explore pre-built IoT Applications

Figure 6-30. *Processing option enabled*

If you click Get Started With Processing, it will suggest that you download the library and save it to the Processing location, as depicted in Figure 6-31.



Temboo makes it simpler and easier to build sketches that connect to over 100 web-based resources and services (e.g. Facebook, Dropbox, US Census data) by standardizing how you interact with their Application Programming Interfaces (APIs). Don't worry if you're not familiar with APIs – with Temboo you don't have to worry about the details.

Here we'll show you how to use Temboo by creating a simple Processing sketch that retrieves the latitude and longitude for a specific address from the Google Geocoding API. What makes Temboo uniquely powerful and useful is that, once you know how to use one API, you know how to work with any API in our Library.

GATHER YOUR SUPPLIES

1. If you don't already have it, download the latest version of **Processing**.
2. Download the **Temboo Library** for Processing. Unzip the file and put the **temboo** folder into your **Documents/Processing/libraries/** folder (or **My Documents/Processing/libraries/** on a PC). If Processing is currently open, restart it so that it will recognize the Temboo library that you just added.

GENERATE YOUR CODE ONLINE

3. **Log in** to Temboo. If you don't already have an account, you can register for free **here**.
4. Go to our Library and find the **Google > Geocoding > GeocodeByAddress** Choreo.

Library . Google . Geocoding . GeocodeByAddress

GeocodeByAddress ☆

Converts a human-readable address into geographic coordinates.

INPUT

Save Profile

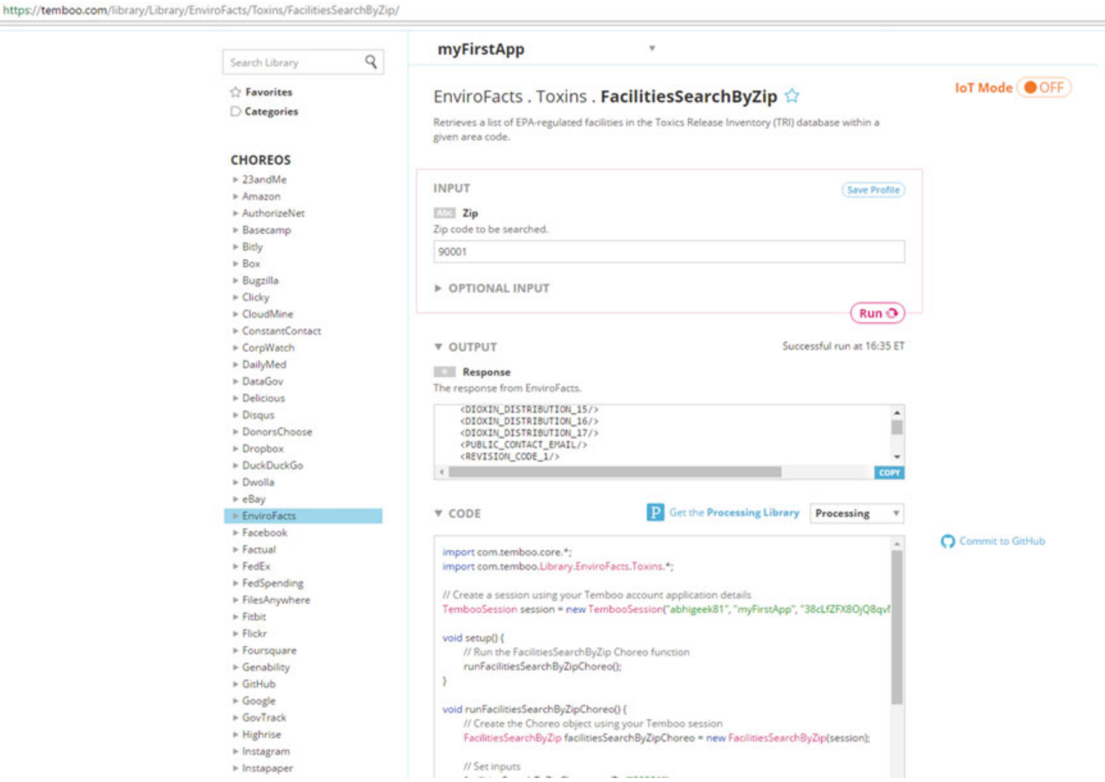
Abc **Address**

The address that you want to geocode.

▶ **OPTIONAL INPUT**

Figure 6-31. *How to start Temboo with Processing*

Every possible thing in Temboo is done through Choreo, so let's see how that looks. Make sure you have downloaded the library files for Processing and copied them to the correct path. We will be using Envirosearch Choreo, and start with finding the zip code for Los Angeles, as shown in Figure 6-32.



EnviroFacts . Toxins . **FacilitiesSearchByZip**

Retrieves a list of EPA-regulated facilities in the Toxics Release Inventory (TRI) database within a given area code.

INPUT

Zip

Zip code to be searched.

90001

▶ OPTIONAL INPUT

▼ OUTPUT

Successful run at 16:35 ET

Response

The response from EnviroFacts.

```
    <DIOXIN_DISTRIBUTION_15/>
    <DIOXIN_DISTRIBUTION_16/>
    <DIOXIN_DISTRIBUTION_17/>
    <PUBLIC_CONTACT_EMAIL/>
    <REVISION_CODE_1/>
```

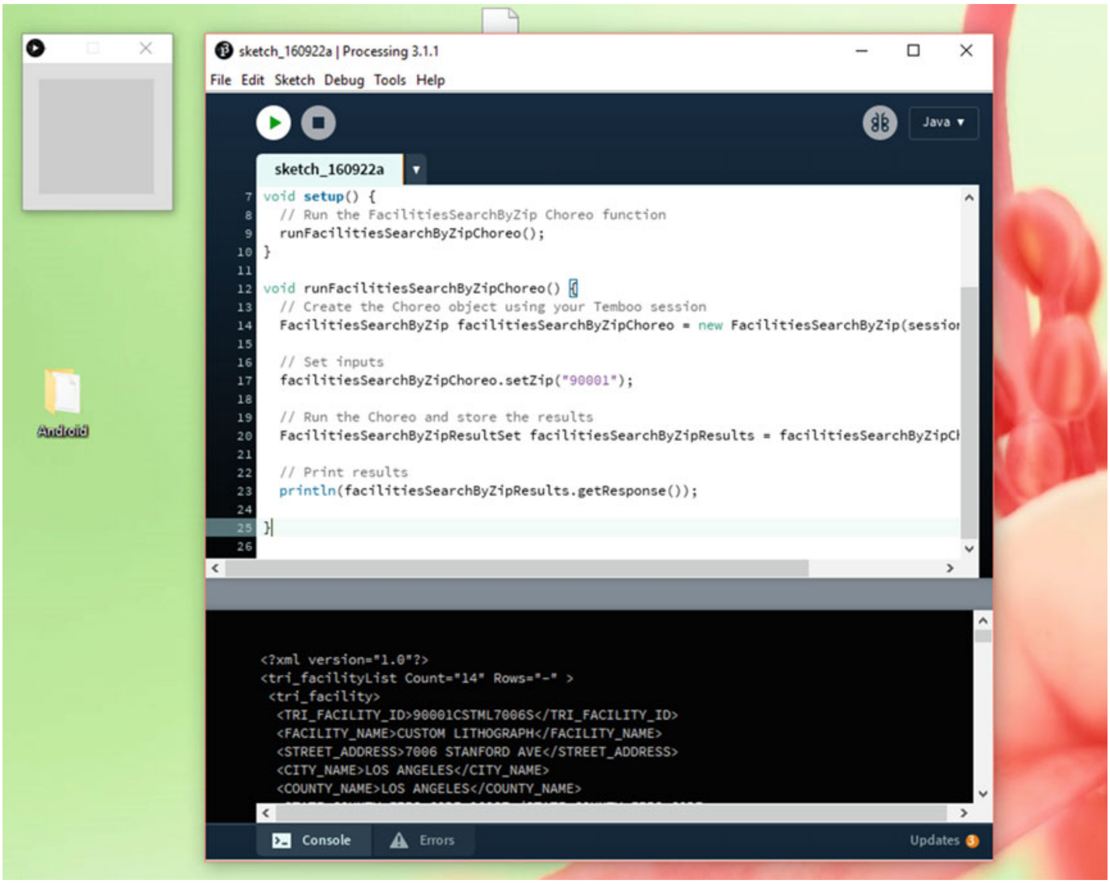
▼ CODE

Processing

```
import com.temboo.core.*;
import com.temboo.Library.EnviroFacts.Toxins.*;

// Create a session using your Temboo account application details
TembooSession session = new TembooSession("abhigeek81", "myFirstApp", "38cLfZFX8OjQ8qv

void setup() {
    // Run the FacilitiesSearchByZip Choreo function
    runFacilitiesSearchByZipChoreo();
}

void runFacilitiesSearchByZipChoreo() {
    // Create the Choreo object using your Temboo session
    FacilitiesSearchByZip facilitiesSearchByZipChoreo = new FacilitiesSearchByZip(session);

    // Set inputs
```

Figure 6-32. *Temboo EnviroFacts Choreo*

Let's run the code in Processing. We see the output shown in Figure 6-33. Name the app FirstChoreo.


sketch_160922a | Processing 3.1.1
File Edit Sketch Debug Tools Help
Java
sketch_160922a
Console
Errors
Updates 3
Android

```
void setup() {
  // Run the FacilitiesSearchByZip Choreo function
  runFacilitiesSearchByZipChoreo();
}

void runFacilitiesSearchByZipChoreo() {
  // Create the Choreo object using your Temboo session
  FacilitiesSearchByZip facilitiesSearchByZipChoreo = new FacilitiesSearchByZip(sessior

  // Set inputs
  facilitiesSearchByZipChoreo.setZip("90001");

  // Run the Choreo and store the results
  FacilitiesSearchByZipResultSet facilitiesSearchByZipResults = facilitiesSearchByZipCl

  // Print results
  println(facilitiesSearchByZipResults.getResponse());

}
```

```
<?xml version="1.0"?>
<tri_facilityList Count="14" Rows="-" >
 <tri_facility>
  <TRI_FACILITY_ID>90001CSTML7006S</TRI_FACILITY_ID>
  <FACILITY_NAME>CUSTOM LITHOGRAPH</FACILITY_NAME>
  <STREET_ADDRESS>7006 STANFORD AVE</STREET_ADDRESS>
  <CITY_NAME>LOS ANGELES</CITY_NAME>
  <COUNTY_NAME>LOS ANGELES</COUNTY_NAME>
```

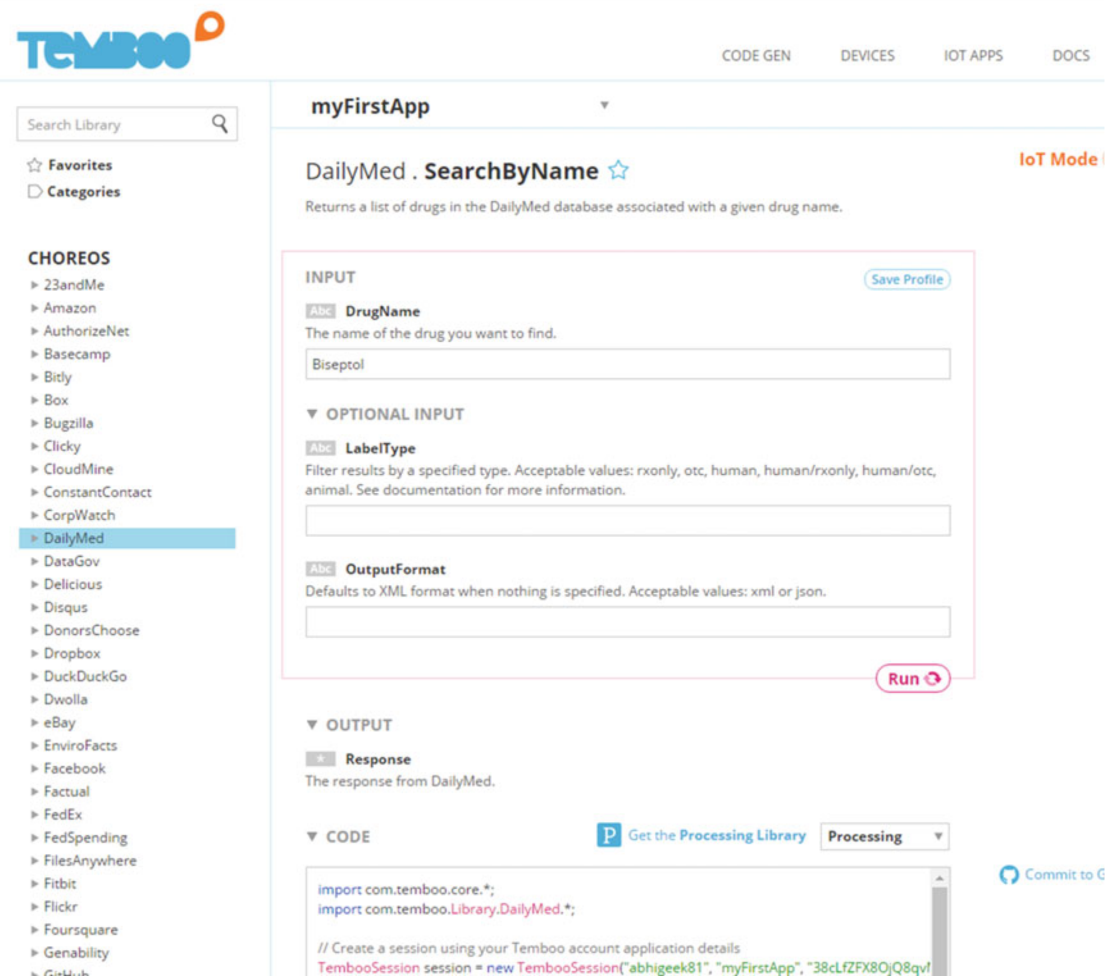
Figure 6-33. *Running the code in Processing*

The code is given in Listing 6-7.

Listing 6-7. The Code for Processing with Temboo

```
import com.temboo.core.*;
import com.temboo.Library.EnviroFacts.Toxins.*;

// Create a session using your Temboo account application details
TembooSession session = new TembooSession("abhigeek81", "myFirstApp",
"38cLfZFX8OjQ8qvMW1wiktIE6msnvQv2");

void setup() {
  // Run the FacilitiesSearchByZip Choreo function
  runFacilitiesSearchByZipChoreo();
}

void runFacilitiesSearchByZipChoreo() {
  // Create the Choreo object using your Temboo session
  FacilitiesSearchByZip facilitiesSearchByZipChoreo = new FacilitiesSearchByZip(session);
  // Set inputs
  facilitiesSearchByZipChoreo.setZip("90001");

  // Run the Choreo and store the results
  FacilitiesSearchByZipResultSet facilitiesSearchByZipResults = facilitiesSearchByZipChoreo.
run();

  // Print results
  println(facilitiesSearchByZipResults.getResponse());

}Internet of Things (IoT)and TembooCode for Processing
```

Next, use the DailyMed Choreo. First use SearchByName for drug details, as depicted in Figure 6-34.



DailyMed . **SearchByName**

Returns a list of drugs in the DailyMed database associated with a given drug name.

INPUT

DrugName
The name of the drug you want to find.
Biseptol

▼ OPTIONAL INPUT

LabelType
Filter results by a specified type. Acceptable values: rxonly, otc, human, human/rxonly, human/otc, animal. See documentation for more information.

OutputFormat
Defaults to XML format when nothing is specified. Acceptable values: xml or json.

▼ OUTPUT

Response
The response from DailyMed.

▼ CODE

```
import com.temboo.core.*;
import com.temboo.Library.DailyMed.*;

// Create a session using your Temboo account application details
TembooSession session = new TembooSession("abhigeek81", "myFirstApp", "38cLfZFX8OjQ8qvl
```

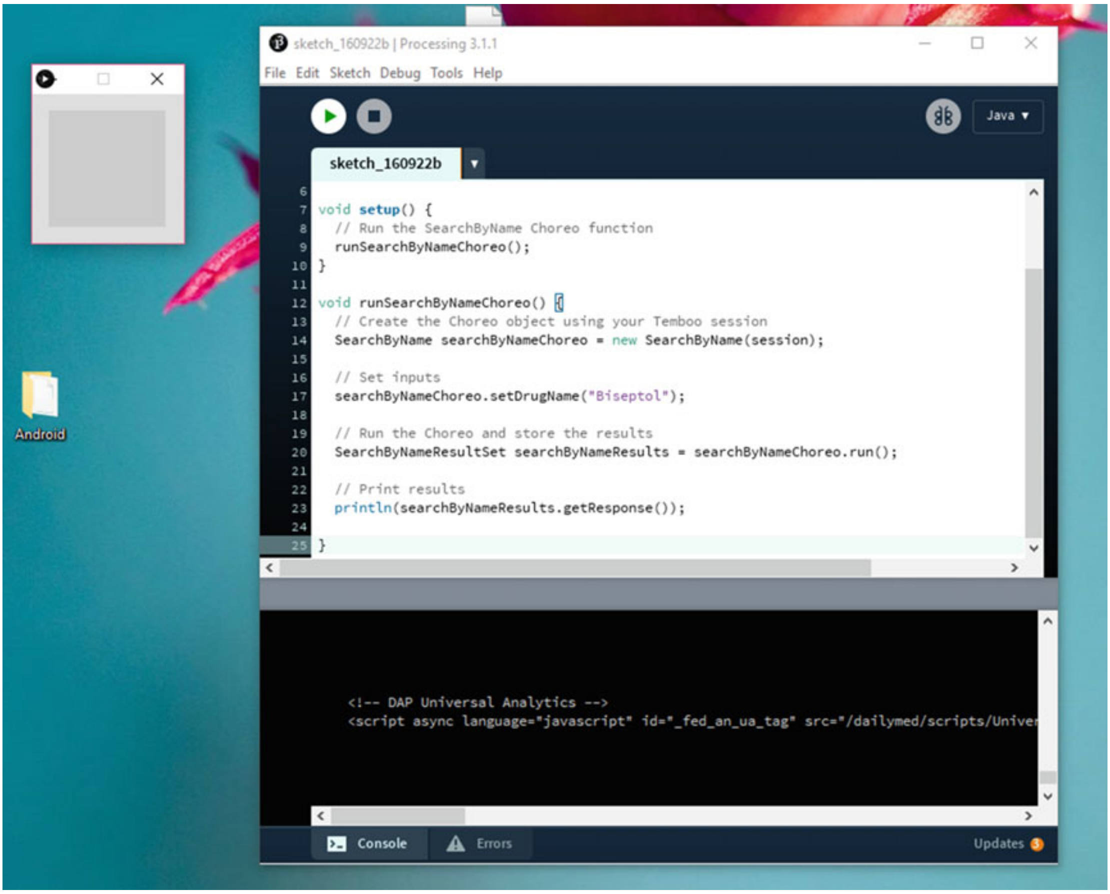
Figure 6-34. *Searching on a drug name*

The code for this is given in Listing 6-8.

Listing 6-8. The Code for Finding the Drug Detail

```
import com.temboo.core.*;
import com.temboo.Library.DailyMed.*;

// Create a session using your Temboo account application details
TembooSession session = new TembooSession("abhigeek81", "myFirstApp",
"38cLfZFX8OjQ8qvMW1wiktIE6msnvQv2");

void setup() {
        // Run the SearchByName Choreo function
        runSearchByNameChoreo();
}

void runSearchByNameChoreo() {
        // Create the Choreo object using your Temboo session
        SearchByName searchByNameChoreo = new SearchByName(session);

        // Set inputs
        searchByNameChoreo.setDrugName("Biseptol");

        // Run the Choreo and store the results
        SearchByNameResultSet searchByNameResults = searchByNameChoreo.run();

        // Print results
        println(searchByNameResults.getResponse());

}
```

When you run the code in Processing, you will get the output shown in Figure 6-35.


sketch_160922b | Processing 3.1.1
File Edit Sketch Debug Tools Help
Java ▾
sketch_160922b
Android
Console
Errors
Updates 3

```
void setup() {
  // Run the SearchByName Choreo function
  runSearchByNameChoreo();
}

void runSearchByNameChoreo() {
  // Create the Choreo object using your Temboo session
  SearchByName searchByNameChoreo = new SearchByName(session);

  // Set inputs
  searchByNameChoreo.setDrugName("Biseptol");

  // Run the Choreo and store the results
  SearchByNameResultSet searchByNameResults = searchByNameChoreo.run();

  // Print results
  println(searchByNameResults.getResponse());
}
```

```
<!-- DAP Universal Analytics -->
<script async language="javascript" id="_fed_an_ua_tag" src="/dailymed/scripts/Unive
```

Figure 6-35. *The output runs*

The code for the output is shown in Listing 6-9.

Listing 6-9. The Code

```
import com.temboo.core.*;
import com.temboo.Library.DailyMed.*;

// Create a session using your Temboo account application details
TembooSession session = new TembooSession("abhigeek81", "myFirstApp",
"38cLfZFX8OjQ8qvMW1wiktIE6msnvQv2");

void setup() {
  // Run the SearchByName Choreo function
  runSearchByNameChoreo();
}

void runSearchByNameChoreo() {
  // Create the Choreo object using your Temboo session
  SearchByName searchByNameChoreo = new SearchByName(session);

  // Set inputs
  searchByNameChoreo.setDrugName("Biseptol");

  // Run the Choreo and store the results
  SearchByNameResultSet searchByNameResults = searchByNameChoreo.run();

  // Print results
  println(searchByNameResults.getResponse());

}
```

Summary

In this chapter we integrated Processing into Windows 10 UWP and then also extended Processing for Temboo. The book thus concluded with some simple constructs of creative coding in a different way.

Index

A. Nandy and D. Chanda, *Beginning Platino Game Engine*, DOI 10.1007/978-1-4842-2484-7