Chapter No. 1
"Installing Eclipse, ADT, and SDK"
In this package, you will find:
A Biography of the author of the book
A preview chapter from the book, Chapter NO.1 "Installing Eclipse, ADT,and SDK"
A synopsis of the book’s content
Information on where to buy this book

About the Author

Sanjay Shah has worked on diverse areas of application development across the mobile and web platform with more than 8 years of experience. He is currently working as a Software Architect and works in the area of Cloud Based Big Data Analytics combined with Distributed Cognition leveraging various Java-based technologies. He is fond of philosophy and enjoys life in Nepal, the land of the highest peak in the world, Mt. Everest.

I would like to thank each and every one who knows me and supported me at different aspects of my life. Special thanks to my parents without whom I wouldn't be what I am today.

Khirulnizam Abd Rahman is a Computer Science lecturer in the faculty of Information Science and Technology, Selangor International Islamic College, Malaysia. He has been teaching programming since the year 2000.

He started publishing Android apps in the year 2010, and his apps among others are Malay Proverb Dictionary (Peribahasa) and m-Mathurat. Currently, he is working on the

For More Information:
apps for Windows Phone Version 8. PHP, C#, and Java are also the programming languages that he is familiar with.

I would like to express my deepest gratitude to my beloved family; Mahani, Luqman, Muna, and Amir for making my life more colorful. Because of you, I am a grown up person with a heart full of love. In fact, as long as they are happy, I will be happy. Other than programming, teaching, writing and being with my family, I don't have anything else to do.

For More Information:
Android Development Tools for Eclipse

Android Development Tools for Eclipse will show you how to use ADT (Android Development Tools) for Eclipse to quickly set up Android projects, create application UI, debug and export a signed (or unsigned) .apk package for distribution using a hands-on practical approach. The book starts with the installation of ADT, discusses important tools and guides you through Android application development from scratch, demonstrating different concepts and implementation, and finally helps you distribute it.

What This Book Covers

Chapter 1, Installing Eclipse, ADT, and SDK, guides you through the installation of Eclipse and ADT(Android Development Tools) needed for Android application development.

Chapter 2, Important Features of the IDE, describes several important features in Eclipse and an ADT Environment useful to develop native Android apps.

Chapter 3, Creating a New Android Project, guides you through the creation of a new project and demonstrates the usage of simple widgets. It also guides across compiling, debugging, and running the application.

Chapter 4, Incorporating Multimedia Elements, will teach you how to include multimedia elements and handle multiple screens in the application.

Chapter 5, Adding RadioButton, CheckBox, Menu, and Preferences, deals with adding menus and Preference Screen and the usage of radio button and check box.

Chapter 6, Handling Multiple Screen Types, teaches you how to tackle different screen types and orientations.

Chapter 7, Adding External Library, guides you through adding external library, that is, the AdMob library and incorporating advertisements in the application.

Chapter 8, Signing and Distributing APK, shows the steps involved in signing and distributing the Android application.

For More Information:
This chapter serves as an installation instruction for all the development toolkits required to develop Android on Windows environment. It is separated into the following subtopics:

- Brief introduction to the Android platform
- Installing the Java Development Kit (JDK)
- Installing the Android SDK
- Installing the Eclipse (Juno)
- Installing the Android Development Toolkits (ADT) in Eclipse (Juno)
- Linking the Android SDK to the Eclipse

Before we proceed with the installation guide, there is some basic information an Android developer must know.

For More Information:
Introducing the Android platform

In simple terms, Android is a Linux based operating system for touch screen devices developed by Android Inc., financed by Google and was bought in later 2005. The beta version of Android came back in November 2007 and the commercial version 1.0 was released in September 2008. As of 2013, over 500 million active devices use the Android OS worldwide.

What is Android?

Android is a software stack for mobile devices that includes an operating system, middleware and key applications (platform). The Android Software Development Kit (SDK) provides the tools and Application Programming Interfaces (APIs) necessary to begin developing applications on the Android platform using the Java programming language. The kernel of Android is Linux.

Introducing the Android app

A mobile software application that runs on Android is an Android app. The apps use the extension of .apk as the installer file extension. There are several popular examples of mobile apps such as Foursquare, Angry Birds, Fruit Ninja, and so on.

Primarily in an Eclipse environment, we use Java, which is then compiled into Dalvik bytecode (not the ordinary Java bytecode). Android provides Dalvik virtual machine (DVM) inside Android (not Java virtual machine JVM). Dalvik VM does not ally with Java SE and Java ME libraries and is built on Apache Harmony java implementation.

For More Information:
What is Dalvik Virtual?
Dalvik VM is a register-based architecture, authored by Dan Bornstein. It is being optimized for low memory requirements and the virtual machine was slimmed down to use less space and less power consumption.

Understanding API level
API level is an integer value that uniquely identifies the framework API revision offered by a version of the Android platform.

The Android platform provides a framework API that applications can use to interact with the underlying Android system. The framework API consists of:

- A core set of packages and classes
- A set of XML elements and attributes for declaring a manifest file
- A set of XML elements and attributes for declaring and accessing resources
- A set of Intents
- A set of permissions that applications can request, as well as permission enforcements included in the system

How many versions (distributions) Android has?
The latest distribution statistics until May 1, 2013, are shown in the following screenshot. It indicates that Android 2.3.3 has the largest market share; however, Android 4.1.x is gaining momentum and will have the dominant share. It is important to know that if the app is primarily targeted to an Android version, it will not run on the previous version of Android.
Installing Eclipse, ADT, and SDK

For instance, if you are developing an app for Android 2.2 (API level 8), then the application will not run on Android 2.1 (API level 7) and below. However, the app is compatible for Android 2.2 and later.

![Pie chart of the Android API level distribution](http://developer.android.com/about/dashboards/index.html)

<table>
<thead>
<tr>
<th>Version</th>
<th>Codename</th>
<th>API</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.6</td>
<td>Donut</td>
<td>4</td>
<td>0.1%</td>
</tr>
<tr>
<td>2.1</td>
<td>Eclair</td>
<td>7</td>
<td>1.7%</td>
</tr>
<tr>
<td>2.2</td>
<td>Froyo</td>
<td>8</td>
<td>3.7%</td>
</tr>
<tr>
<td>2.3-2.3.2</td>
<td>Gingerbread</td>
<td>9</td>
<td>0.1%</td>
</tr>
<tr>
<td>2.3.3-2.3.7</td>
<td>Gingerbread</td>
<td>10</td>
<td>38.4%</td>
</tr>
<tr>
<td>3.2</td>
<td>Honeycomb</td>
<td>13</td>
<td>0.1%</td>
</tr>
<tr>
<td>4.0.3-4.0.4</td>
<td>Ice Cream Sandwich</td>
<td>15</td>
<td>27.5%</td>
</tr>
<tr>
<td>4.1.x</td>
<td>Jelly Bean</td>
<td>16</td>
<td>26.1%</td>
</tr>
<tr>
<td>4.2.x</td>
<td></td>
<td>17</td>
<td>2.3%</td>
</tr>
</tbody>
</table>

The Android API level distribution
(Source: http://developer.android.com/about/dashboards/index.html)

For More Information:
Preparing for Android development

In this part of the chapter, we will see how to install the development environment for Android on the Eclipse Juno (4.2). Eclipse is the major IDE for Android development (see the following screenshot). We need to install eclipse extension ADT (Android Development Toolkit) for development of the Android Application:

ADT on Eclipse in action

To download Android packages a Google API internet connection is a must, hence take this in notice before moving further. The steps on Windows using Eclipse Juno are as follows:

Software needed:

- Latest JDK1.6.x from Oracle
- Latest Android SDK
- Eclipse 4.2 (Juno)

Installing the JDK

To check whether your PC has an existing JDK and it is installed correctly, go to command prompt, and type `javac -version` (as shown in the following screenshot). It is recommended to install JDK 1.6.x for Android Application Development as it may complain that the compiler compliance level is greater than 6, and could run into problems:

You may download JDK 1.6 (Java Development Toolkit) from the download site and install it. Make sure that JAVA_HOME is set after the installation, and check the version executing the preceding command [link](http://www.oracle.com/technetwork/java/javase/downloads/index.html) (see the following screenshot).

This step can be skipped if we have java 1.6.x installed:

For More Information:
Installing the Android SDK

Create a folder named `android-dev` (android-dev is just a suggestion; you may create another name instead). The folder `android-dev` will be used consistently throughout this chapter. This folder is to hold all the software that is needed for Android development. This folder is needed again in another procedure.

Download from http://developer.android.com/sdk/index.html, and install this software in the `android-dev` folder. Bear in mind this download only provides the basic tools of Android SDK, not the complete installation. Later, we need to download the Android system images, APIs, examples, documentations and other libraries:

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Installing Eclipse, ADT, and SDK

After completion of the download, install the SDK in the folder mentioned earlier; in C:\android-dev\android-sdk as shown in following screenshot.

During the installation, the Android SDK will detect the Java Development Kit in the machine. If we have installed the latest JDK, it should have no problems:

![Android SDK installation path](image)

For More Information:

Installing the Eclipse (Juno)

Eclipse Juno (4.2) is available for download at http://www.eclipse.org/downloads/:

![Download page of Eclipse Classic](image)

The Eclipse comes in a ZIP file, so just unzip it and find the `eclipse.exe` file to run it.

For More Information:
Immediately extract Eclipse in the folder as created earlier (in C:\android-dev). After the extraction, create a desktop shortcut to make life easier, as depicted in the following screenshot:

Create Eclipse shortcut
Installing the ADT in Eclipse Juno

Run Eclipse by identifying the Eclipse installation folder and double-click eclipse.exe (or double-click the shortcut in the Desktop). Provide a folder to store all the projects' source codes. And once again, create this folder under the android-dev folder, as shown in the following screenshot:

![Select Eclipse Workspace](image)

This new Eclipse installation does not provide the Android Developer Toolkits (ADT) plugins. To install this plugin navigate to Window | Preferences to open the Preferences panel. Click on Install/Update | Available Software Sites (on the left panel). Click on the Add button (on the right panel) to add a software download site (again an Internet connection is needed).

Installing Eclipse, ADT, and SDK

Another window will appear. Provide ADT in the Name (for example), and the Location https://dl-ssl.google.com/android/eclipse/(as provided in http://developer.android.com/sdk/eclipse-adt.html):

In the Available Software dialog, select the checkbox next to Developer Tools and click on Next. In the next window, you’ll see a list of the tools to be downloaded. Select all except NDK plugins and click on Next. We will be discussing the tools in the next chapters:

For More Information:
Selecting the ADT and SDK tools

Read and accept the license agreements, then click on **Finish**. If you get a security warning saying that the authenticity or validity of the software can't be established, click on **OK**. When the installation completes, restart **Eclipse**.

For More Information:  
Linking the Android SDK to the Eclipse

Run Eclipse. In the Windows | Preferences, click on Android. Locate the folder of the android-sdk from the step where you installed the android-sdk, as shown in the following screenshot:

Click on Apply and hit OK.

For More Information:
The next thing to do is to download the Android APIs and the operating system images. Installing Android SDK is time consuming. It requires a smooth broadband line because after the installation you need to download the API package for Android and Google API.

To start this, click on the **Android SDK Manager** icon, as shown in the following screenshot:

For More Information:  
Installing Eclipse, ADT, and SDK

You will be provided with the list of all SDK Platforms for all Android versions. I suggest you be selective, just download your target platform first. If you are to develop an app for Froyo (Android 2.2) you need to download the API version 8. Later, when you have more time, you could come back and download for the other version. If you do not have any time and Internet data constraints then you may download all. It will fetch API packages, Android OS images, debugging tools and other softwares related to Android development.

For this time, we will download the latest SDK with **Jellybean** system image and **API level** 16, as shown in the following screenshot:

![Installing SDK with API level 16](image)

For More Information:
Before hitting the **Install** button, there is one important tip I’d like to share. While conducting this procedure, we may encounter a connection reset problem for no specific reason. To get over this issue, on the **Android SDK Manager** window, navigate to **Tools | Options**. Uncheck the Force **https://...sources to be fetched using https://...** option, and **Close** (shown in the following screenshot). You may start the SDK and API installation now:

For More Information:  
After the SDK, APIs and system images have been downloaded, restart Eclipse. The wait is worth it! After almost a couple of hours of installation and downloading packages, I got this nice graphical interface for the screen layout arrangement, as shown in the following screenshot. Check the Android Preferences window, and you may see the Android 4.1 in the API list. To add another API, again you need to download through the Android SDK Manager:

![Android Preferences Window](image)

List of Android APIs


In the next chapter, we will look into tools of an ADT environment that eases the development.

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**For More Information:**
Summary
In this chapter, we learnt how to install the Eclipse Juno (the IDE), the Android SDK and the testing platform. The next chapter will discuss the important elements of the IDE before we create a new Android Application project.
Where to buy this book


Free shipping to the US, UK, Europe and selected Asian countries. For more information, please read our shipping policy.

Alternatively, you can buy the book from Amazon, BN.com, Computer Manuals and most internet book retailers.