This application note is design to teach the reader how to setup an Android Development Environment on a Windows 7 Computer using eclipse and how to create an Android application. It first explains all of the software and hardware requirements and explains to the reader how to setup and install each of the required programs. It then explains how to design and code an Android application. Finally it explains how to use the Android Virtual Device to test the application.
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1 Key Terms
SDK (Software Development Kit) - A set of tools and libraries that allow the user to create an application based on a product.

IDE (Integrated Development Environment) – A software application that consists of a source code editor, a compiler, build automation tools and a debugger. It makes programming and running applications easier.

ADT (Android Development Tools) – A plugin for eclipse that extends the Eclipse IDE by providing more tools to develop Android Applications.

AVD (Android Virtual Device) – An Android emulator that allows you to simulate how the application will run on an actual Android device.

JDK (Java SE Development Kit) – A popular Java SDK that is used to program Android applications.

2 Objective
This document will demonstrate how to create an Android application using the Eclipse IDE. It is designed to guide the user through configuring his or her computer for Android development. It also walks the user through creating and running an Android application.

3 System Requirements
Make sure that the computer being used for development meets the software and hardware requirements for the Android SDK and Eclipse.

http://developer.android.com/sdk/requirements.html
4.1 Download and Configure Eclipse IDE

Eclipse is the preferred development environment for Android. You can download eclipse at http://www.eclipse.org/downloads/. It is recommended that you install either classic or the Java Version of eclipse.
4.2 Download Android SDK


2. This should automatically check to see if you have the proper JDK installed. If you do not you can download the newest JDK here: [http://www.oracle.com/technetwork/java/javase/downloads/index.html](http://www.oracle.com/technetwork/java/javase/downloads/index.html)

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Example of options when downloading the SDK.
4.3 Install ADT plugin for eclipse

1. Open Eclipse and go to Help->Install new Software.

![Figure 3.2 Example of options when downloading the SDK.](image)

3. Then put a check mark next to the Developer Tools and click Next.
4. On the next screen it will show all of the tools that will be downloaded. Click Next.
5. Read and agree the license agree to the license agreements then click Finish.
6. Restart Eclipse.

4.4 Configure the ADT plugin.
After installing the ADT it will need to be configured to point to the SDK directory.

1. Click on Window->Preferences->Android.
2. Click on Browse to find the location of your SDK directory.
3. Click Apply, and then OK.
4.5 Adding SDK Components.
1. Click on **Window->Android SDK Manager**.
2. This will allow you to choose the Android platform versions, add-ons tools and other components. Choose the version of Android that you would like you application to work on.
   
   *Note: This application note will be using 2.3.3.*
3. Click **Install Selected** and wait for the components to down. When the download is finished, verify and accept the new components.

4.6 Create an AVD
1. In Eclipse go to **Window->AVD Manager->New**.

   ![AVD Creation Screen](image-url)
2. Type in the **Name** of the AVD and choose a **Target**. The target is the version of the Android SDK that you would like to run on the emulator.

3. Click **Create AVD**.

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**5 Create a new Android Application**

1. In Eclipse go to **File->New->Project...**

2. Select an **Android Project** from the Android Folder and press **Next**.

3. Fill in the details of your Android application.
   
   a. **Project Name**: The project name and folder that Eclipse will store the project files
   
   b. **Build Target**: The version of the Android SDK that will be used when you build your program. Select a platform that is equal to or lower than the target chosen for the AVD.
   
   c. **Application Name**: This is the name of the application.
   
   d. **Package Name**: The namespace that all of the source code will reside under.
   
   e. **Create Activity**: The name for that class stub that is generated by the plugin.

4. The values that are used in this example are:
   
   a. **Project Name**: SampleApp
   
   b. **Build Target**: 2.3.3
   
   c. **Application Name**: SampleApp
   
   d. **Package Name**: com.sample.example
   
   e. **Create Activity**: SampleApp

5. Click on **Finish**.
6 Coding the Application

6.1 Changing the text

1. Open strings.xml which is located in res->values->string.xml. This file will hold all of the text that our layout will use.
   a. Click on the strings.xml at the bottom to bring up the raw xml file.
   b. Using the current string xml format change the xml to include
      i. Name: name  String: Please type your name.
      ii. Name: app_name  String: Hello User
   c. Your xml file should look like:

```
<?xml version="1.0" encoding="utf-8"?>
<resources>
    <string name="name">Please type your name</string>
    <string name="app_name">Hello User</string>
</resources>
```

Figure 7.10 Completed string.xml
6.2 Editing the layout

2. Open `main.xml` which is located in `res/layout/main.xml`. This file will hold the layout of the application which includes labels, textboxes, and other UI interfaces.

   a. Main.xml has a GUI and a raw xml view. The GUI has many different widgets that you can drag and drop onto the screen.

   b. From the form widgets drag a Large text label and from Text Fields drag the first and last name text box onto the phone screen.

   c. Then go to the raw xml view and add `android:text="@string/name"` to the TextView. You can see the final raw xml below. This will take the text that is labeled “name” in the strings.xml and display it for the TextView.

```
<?xml version="1.0" encoding="utf-8"?>

<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical"
    android:layout_width="fill_parent"
    android:layout_height="fill_parent">

    <TextView
        android:id="@+id/textView1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/typename"
        android:textAppearance="?android:attr/textAppearanceLarge" />

    <EditText
        android:id="@+id/edittext"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"/>

</LinearLayout>
```

Figure 7.10 Final main.xml
6.3 Editing the the java code

1. Open SampleApp.java from the left hand side.

2. At the top add the following import statements

   ```java
   import android.view.View;
   import android.view.View.OnKeyListener;
   import android.widget.EditText;
   import android.widget.Toast;
   import android.view.KeyEvent;
   ```

   a. This allows you to use the functions located in these files.

3. Next we need to add the code to get the information from the text box and display it.

   The following code gets the name from the text box and forms it into a string that says “Hello [name]”. Then it uses the the toast class to display the message to the user when enter is pressed. Enter the following code at the end of `onCreate`.

   ```java
   final EditText edittext = (EditText) findViewById(R.id.edittext);
   edittext.setOnKeyListener(new OnKeyListener() {
       public boolean onKey(View v, int keyCode, KeyEvent event) {
           // If the event is a key-down event on the "enter" button
           if ((event.getAction() == KeyEvent.ACTION_DOWN) &&
               (keyCode == KeyEvent.KEYCODE_ENTER)) {
               // Perform action on key press

               // Say Hello
               String name = "Hello " + edittext.getText();
               Toast.makeText(SampleApp.this, name, Toast.LENGTH_SHORT).show();
               return true;
           }
           return false;
       }
   });

4. Save the files.
7 Running the Application

1. Click on the green circle with the white arrow.

2. Choose the AVD that we created in a previous step.

3. The android AVD will load and the program will run.

4. This is what will happen after you enter your Name and press enter.
7. You have successfully completed an android application.

8 Conclusion
Congratulations you have successfully created an Android application. While this application note taught you how to create a basic application you can use the techniques you learned to expand on your application and turn it into something more powerful.

9 Resources

http://www.developer.android.com

http://www.eclipse.org/downloads/