Mobile Computing
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Lecture 06
Android Studio Setup

Hello, today's lecture is your first lecture to watch android development. Today we will see how to setup an android studio environment on your machine. We will also see how to setup an Android emulator and also how to connect your android phone to your machine so you can directly deploy your applications on the android phone.

Here is an android phone that I own. This is a new android phone nexus 6P. You may also already own an android phone. Today I will show you how to connect this phone to your PC and how to deploy applications directly to your phone besides the emulator. Now let us check our Android studio setup on our machine.

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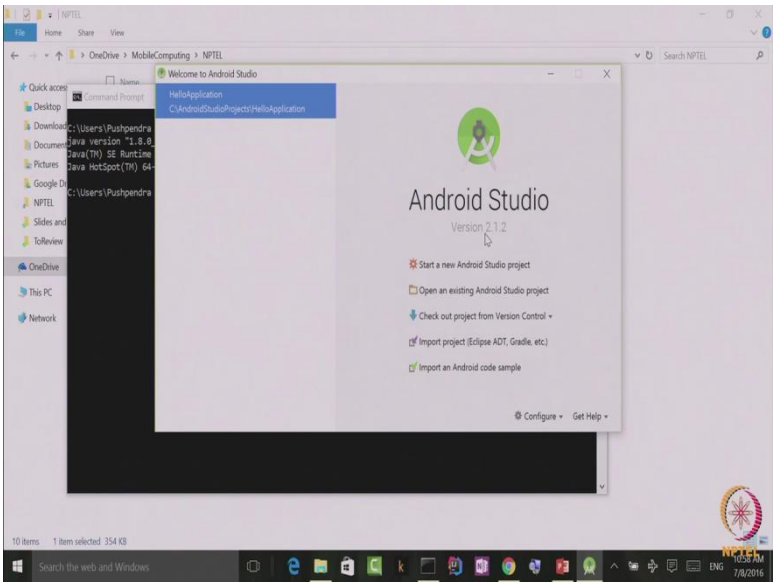

The first step is to check whether the java is correctly installed or not. Java must already be installed because you should have run the java programs as shown in the last lectures. Here I can see that java is correctly installed on my machine. I have already installed android studio on my machine in which you can see is booting up.

This is the screenshot of android studio when it starts you may check the version number here. The version number of the current Android studio is 2.1.2. If you have an older android studio you may choose to update. In order to start with an android studio programming, we can click on this first link which is "Start a new Android Studio project".

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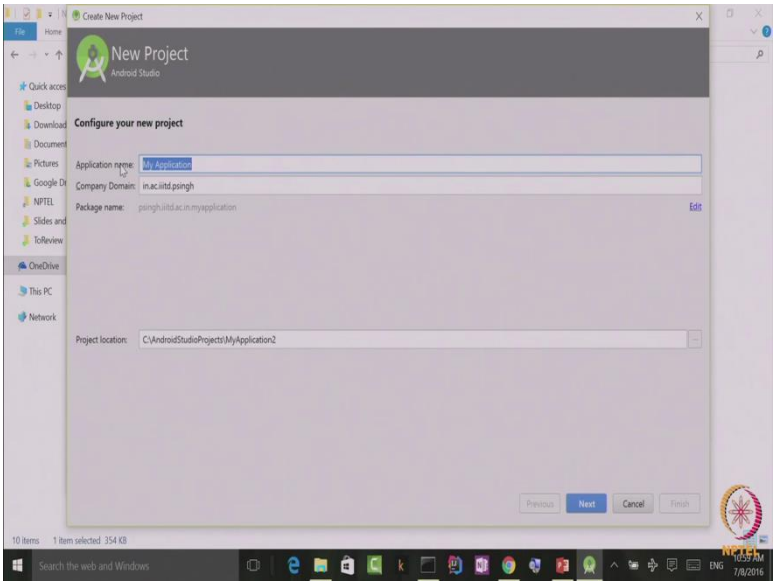

Once I click on it, a new window opens which ask me for my application name, my company domain, package name and project location. Application name refers to the name which you want to give to your application. The company domain in actually refers to the package name indirectly. You may also give a domain name which you own or you may give a domain name of your institute or your company domain.

The idea of company domain is to create a package location that is unique to you on the android play store so for example here I have given in.ac.iiitd.psingh because this is the domain that I own I can be sure that this will be unique when my application is deployed on android play store. The project location is the location of the directory where my files will be stored.

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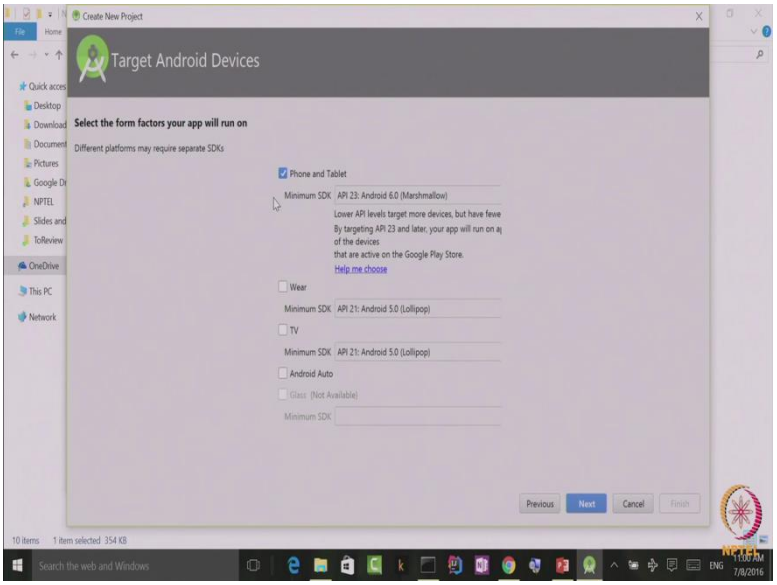

Let us start and give an application name, suppose “hello world” or “my hello world”. As you can see that project location is already updated to the new application name that is given. I will click next then android studio will ask me to select the minimum SDK. When you install an android SDK as a part of android studio you have a choice of installing different SDKs starting from the very beginning of the android devices. The current latest SDK is API 23 and it refers to android 6.0 Marshmallow platform. You should choose an SDK that should allow you deploy your application to the target devices. So if you are targeting your applications only to the newer devices you may choose a latest SDK. However if you are targeting your applications for devices that are very old then you should choose a SDK that is available on those devices.

For example, if I choose my minimum SDK here you can see that what percentage a devices I can target. Let us see I choose an API 5, this is a really old SDK. And android studio is giving me a choice that if I choose an API 5, I can pretty much target any android device deployed anywhere in the world which basically means that my application will be able to run on almost all the android devices that are available. The catch here is that the back I go in time less features would be available forward. So if I want to make use of latest features of android I will have to use an SDK which is also advanced, so API 5 is may be too old for me, so let us try to come and try to see what is available in newer APIs.

So you may have heard of an android version called KitKat. So suppose I choose KitKat, in this case I can target around 73.9 percent of devices. Similarly you can choose different versions, an android studio will give you a rough idea on the number of devices that you can

that you can choose to deploy on your application tool. For this example application, I am going to choose the latest API 23 SDK. This refers to Android 6.0 which is the latest version of android. You may have heard the news of android N which is the new version. However android N is not currently available on the devices except in the developer mode.

So let us choose a android 6.0. I choose android 6.0, the other options are given for android wear devices which are the android watch, android TV devices and other android devices. Currently we are only developing applications for our phone or tablet so we need not to choose.

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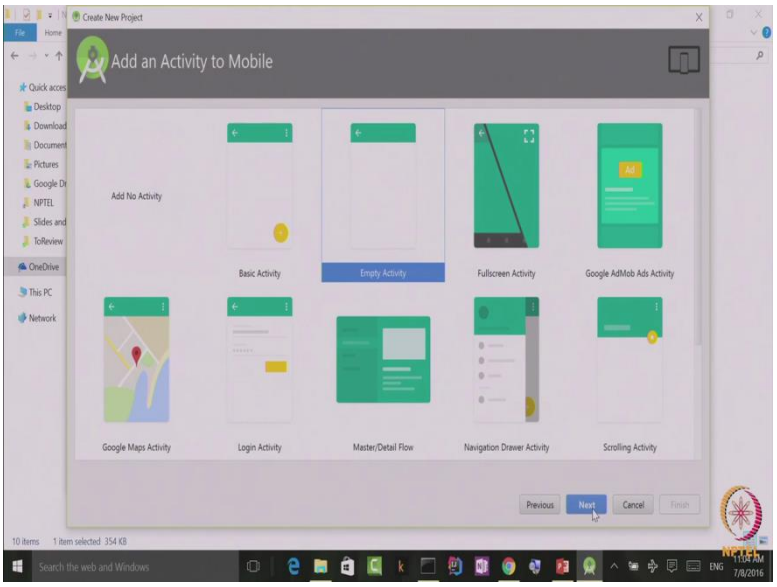

Let us go to the next; the next screen shows you different tablets. If you remember when you were developing our java programs our java IDE also gave us choice of choosing from the template. Choosing from a template helps us because then the IDE create some sample files for us which we can modify.

Here also we have multiple templates to choose. These templates are referred as activities. You will learn more about activities later, but as of now you can understand activity as any action that you do on an android app. So it is starts with choosing a template which says, which is more like a blank template or saying “add no activity” to basic activity, empty activity to full screen activity, AdMob, Google Maps, Login, Master Detail, Navigation Drawer, Scrolling and then coming down to Settings activity and Tabbed activity.

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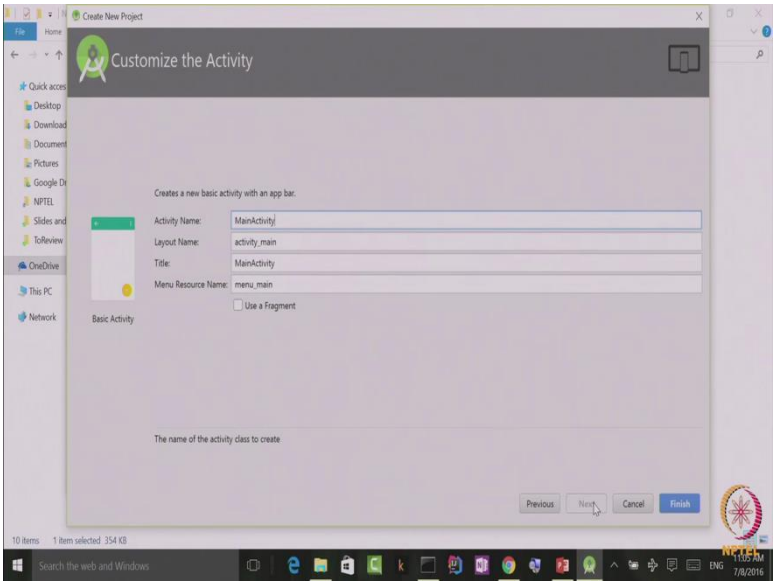

Let us choose basic activity or empty activity any of these are fine for our application. I am choosing a basic activity. After that android studio shows the another window where I need to again fulfill the fields. This is asking for activity name, layout name, title and main resource name. I will only fill the activity name because I called my application “my hello world” I will call my activity “my hello world” activity.

As you can see that I have put the suffix of activity after my activity name. This is again a naming convention for android application development. This helps other programmer understand that what my program code refers to. So please follow the naming convention and also put an activity suffix whenever you want to create an activity in your android program. Based on my activity name android studios already suggesting my layout name, my title and my main resource name, I need not to change it. Now I will press ”finish”. As soon as I press finish my android studio start building and start creating the basic template that I requested, let us wait for it. You may get some of the errors please ignore them for the time being. And as you see that the moment the program compiles, all the initial errors are gone.

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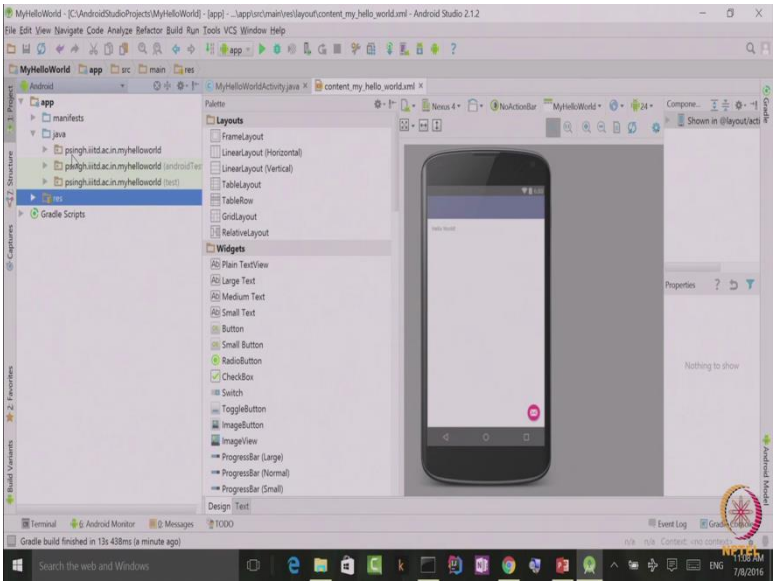

Now Android has already created a very simple empty application for me. You may see different features that are available on Android studio. You may have seen some of the features on the other IDEs. So there is usually a bar showing different menu items and then different bars showing us different buttons to perform different functions. As part of this course you will slowly learn to master Android studio platform. Currently we will only concentrate on the items that we need right now. On your left side you will see certain folders. Let us look into the folder called java under app. You see that there are three other folders inside it one refers to the name that you give “my hello world” preceded by the package name that you gave.

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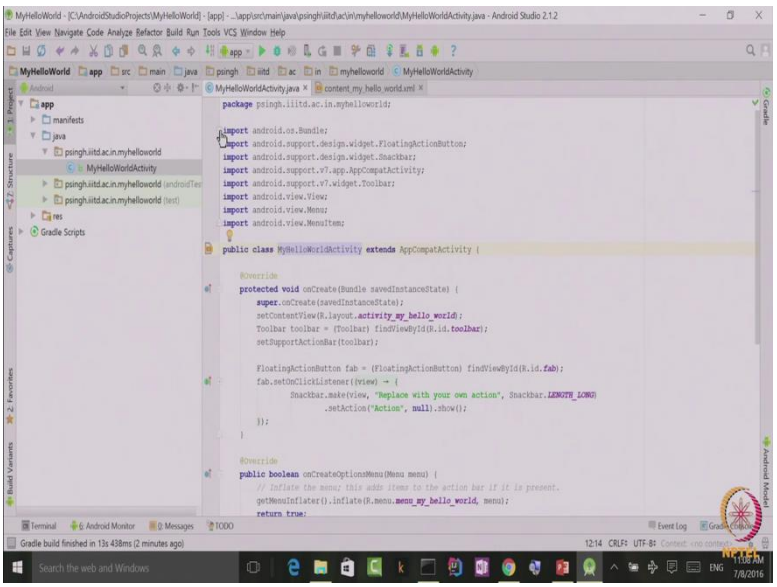

Another refer to Android test, another refer to test, for the time being we will ignore these two folders and we will only concentrate on the top folder. Inside the top folder I see a java class called “my hello world” activity, let us click on it and let us see its basic structure. As you may have seen in previous java applications, it also starts with the package definition is same as we gave it in the beginning, then there are number of import statements and then there is the class that is declared.

We will not go into detail for this example; we will simply look at it the whole structure. So there is a public class by the name that I gave which is the extending another class. There is some Boolean function that has been overridden these are the Boolean function that has been overridden. Based on your java knowledge you may understand that this means that your class is a subclass of app compact activity and it is overriding three functions which may have been declared in the class called app compact activity or in the super class of app compact activity. These functions have been overridden and automated code has been generated by the android studio for it, so you need not worry about it for the time being. Let us again go back to our visual representation of our app.

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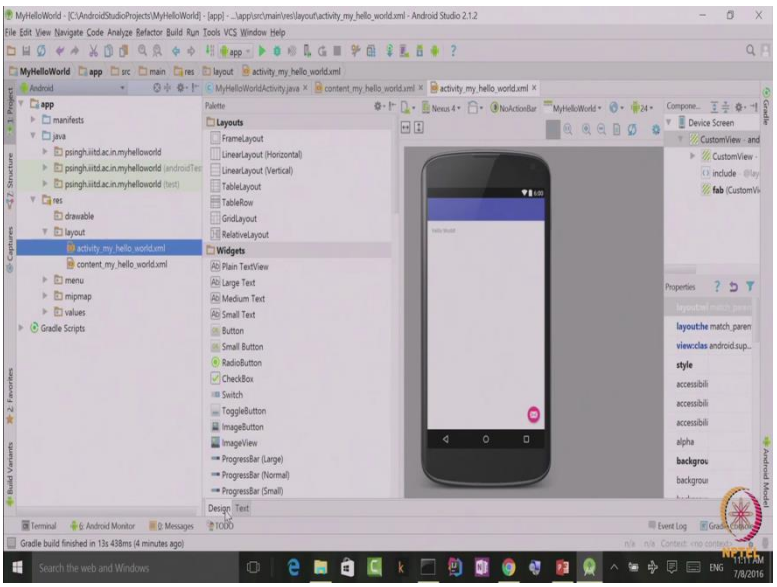

In this case you can see that I am referring to a file content underscore my underscore hello underscore world.xml. Where is this file, so this file resides under the res folder which stands for the resources. Inside the res folder you will find multiple other folders. Currently we are only concern with the folder named as layout. In the layout you will see two files; both of them are xml files. I hope that you already know about xml. If not then this is the good time to revise some of the xml concept or to learn xml. There are many good resources available to

learn basics of xml on internet. Please follow any of them I will also give a link of some of the xml sources on the NPTEL websites for your reference.

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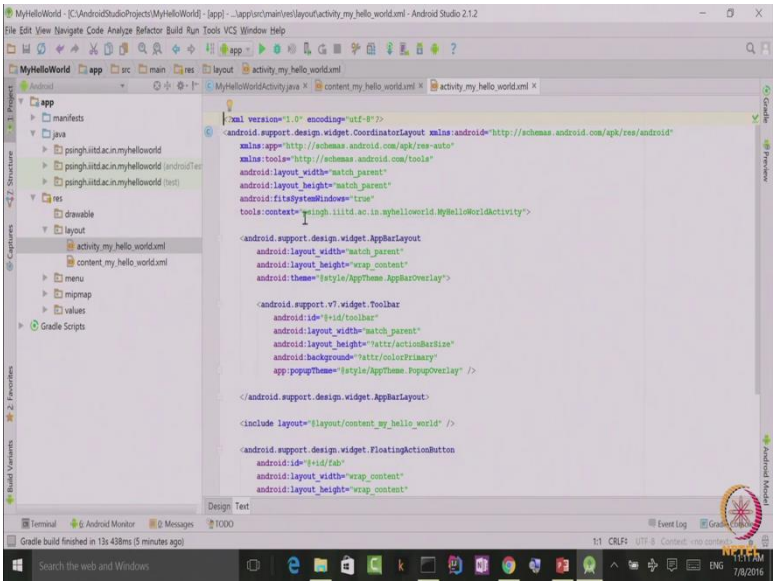

Let us go back and check our layout files. Let us first check our activity underscore my underscore hello underscore hello world underscore world.xml file. As you will see that this file is now displayed, it is showing us a design I will choose a tab called a text. Now this is the text of the activity underscore my underscore hello underscore world.xml file. You will see that this is the typical xml file starting from xml naming space before that xml version is given and then the different xml fields are given. We will go into detail of it later on. Similarly you can create and see that the content has different options available to us some layout options, some widget options.

I will very soon explain you what do they mean, but you may guess that for example there is a widget of so called button. You may have used android applications where you press a button and something happens. Now you can see that a widget of button is available for you. Another file of interest to us is under the values folder. In the values folder there are again multiple folders are given, currently we will only look at a folder file called strings.xml.

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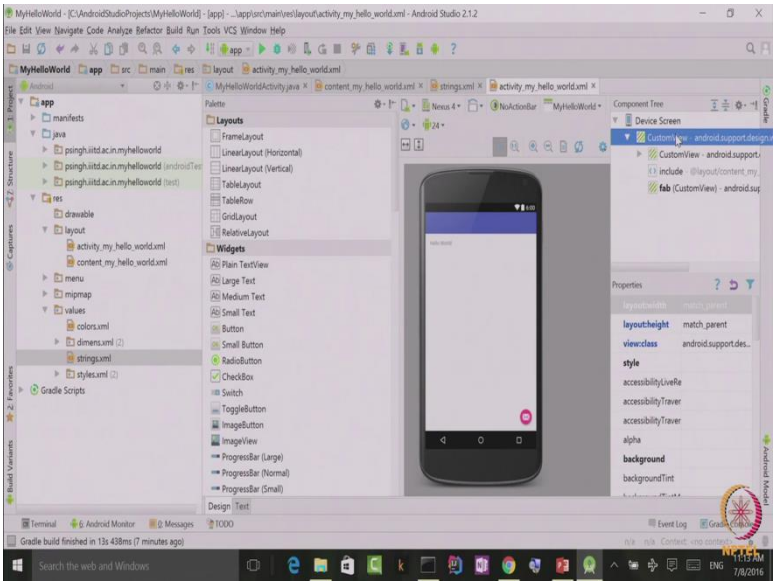

And you see that the strings.xml starts with resources and inside the resources it is describing two strings one is app name and another is action statics. That is all for you to know, let us come back to our visual representation. On the right hand side you can see what is on your devices and then you can see properties. Please try to make yourself familiar with the android studio. Try to change the things and see how they look for example currently it is showing how my application will look on a Nexus 4 device. Here you can see nexus 4 let me change, I can change it to any other device for example, I can it to that how would it would look on an nexus 6 device which is my font in the nexus 6P.

So I select nexus 6P and as you can see that the nexus 6P devices are bigger. Now the display is changed to a bigger device. This is a very good tool to check how your application will look like on different android devices. If you want you can even check that how your application will look like on all the screen sizes that are available in android space.

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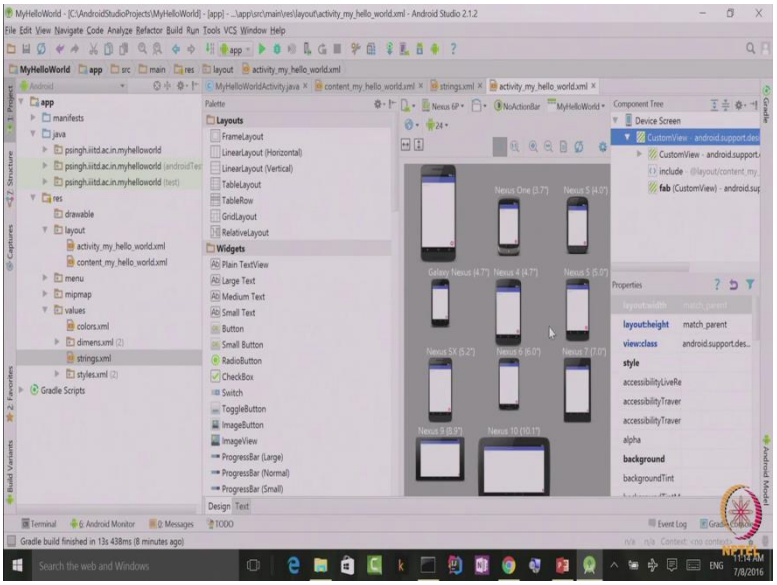

Let me choose preview all screen sizes. This take some time but now you can see how your application will look like bigger phones like nexus 6P on smaller phones like Nexus S or nexus one and different nexus devices that have been released over time including the templates. Let us go back to our previous preview and let us just change it for nexus 4 as it was in the beginning fine.

So this is your basic introduction with android studio. I hope you will test different android functionalities using your android studio. In our next lecture we will continue with our “my hello world” application and we will try to display a welcome message. This will be your hello world equivalent into the android application development. Thank You.