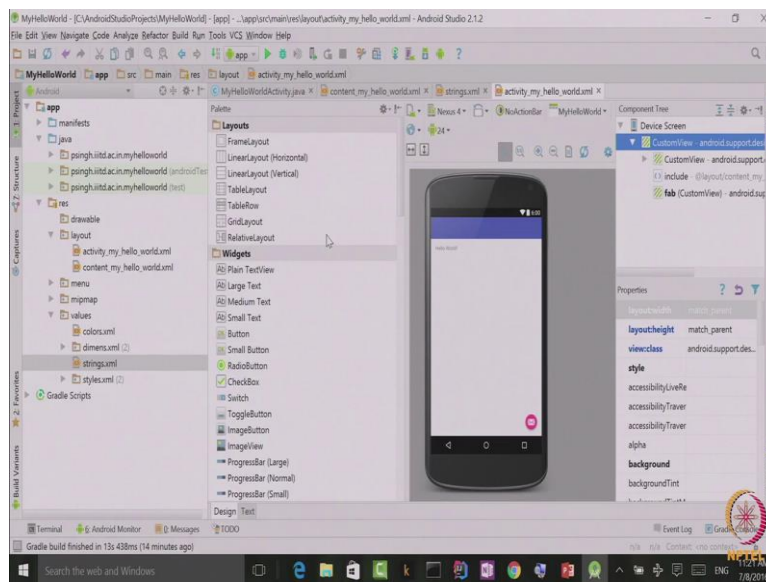


Mobile Computing
Professor Pushpedra Singh
Indraprasth Institute of Information Technology Delhi
Android Development
Lecture 07

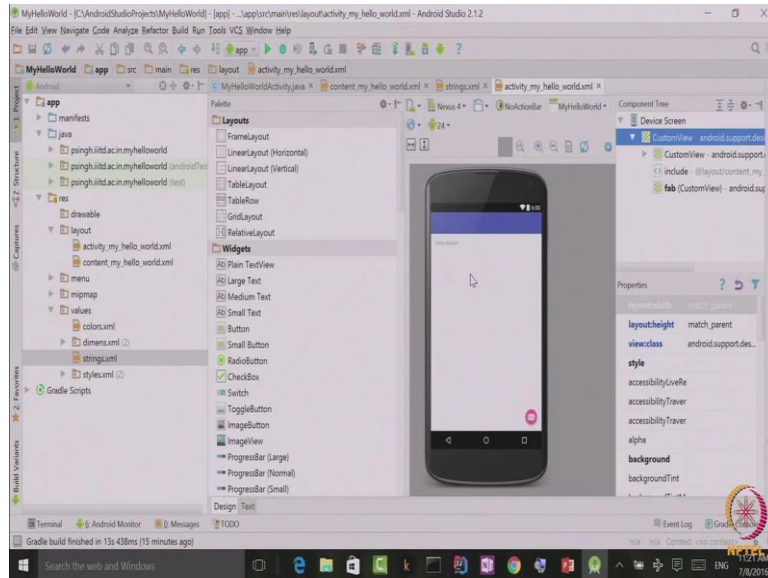
Hello, in last lecture you saw us creating a basic activity and an empty android file. Now we will go back and we will try to convert our android application to display us a welcome message. We will then also see how to run this application on an emulator. Which is a mechanism to run android application when you do not own a device and also how to transfer this application to an actual mobile device.

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Now let's get back to our android studio. While watching you this video I will advise you to open your android development environment and start programming as you go through the video. If you face any problem in text shown in the video please fill free to send a mail to the forum and I or one my TA will answer it.

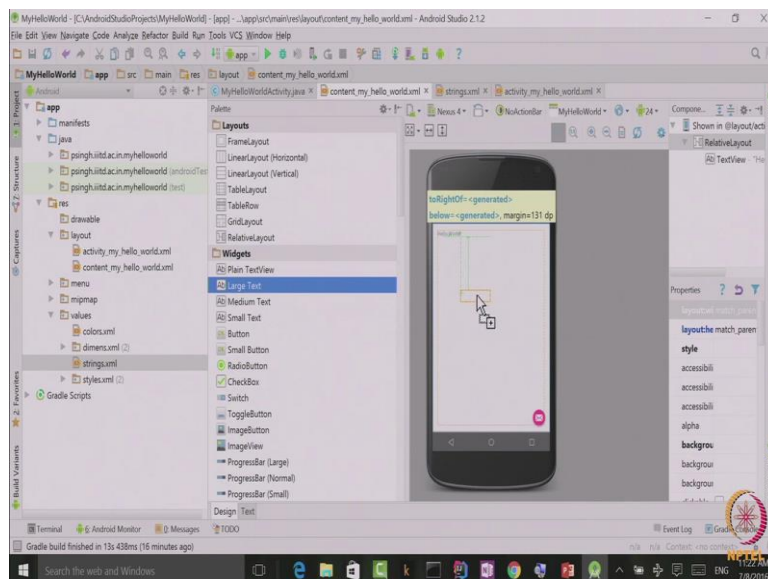
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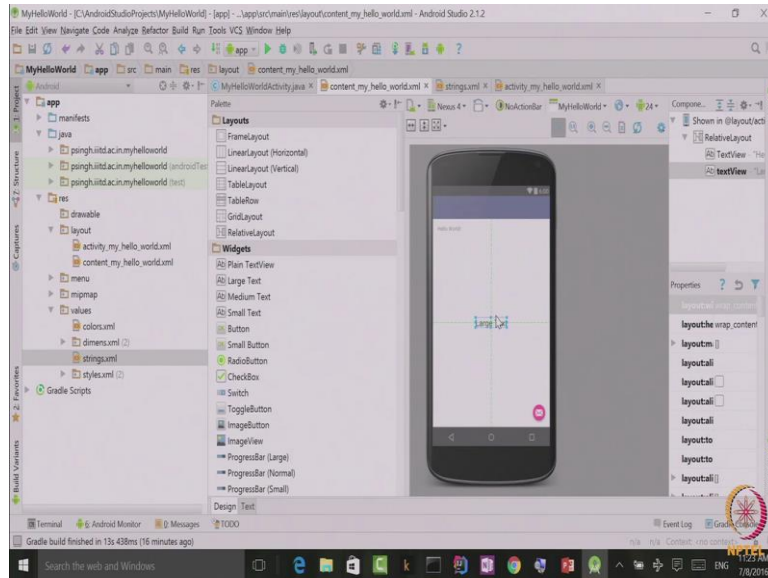


Let's see this is our application that we were developing last time. You can see everything is same now I want my application to display me a welcome message. I will do few things using the GUI and then I will also show you how to do that using the XML. So number one we want to display a welcome message which is kind of a text.

So let me select among the text options. There are four text options that are given to me. Plain text view, large text, medium text, small text. I will select large text and I want to display this large text in the middle of my android screen. All I have to is to drag the large text and trying to drop it on my android device here let me check.

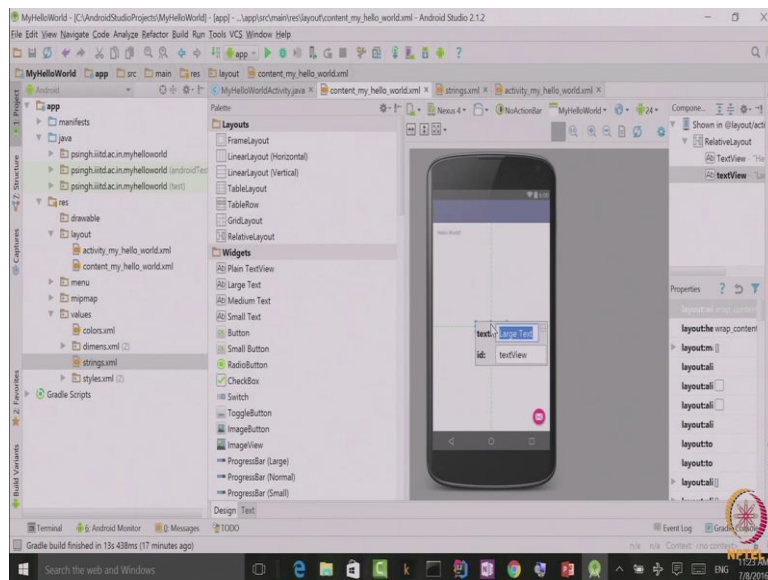
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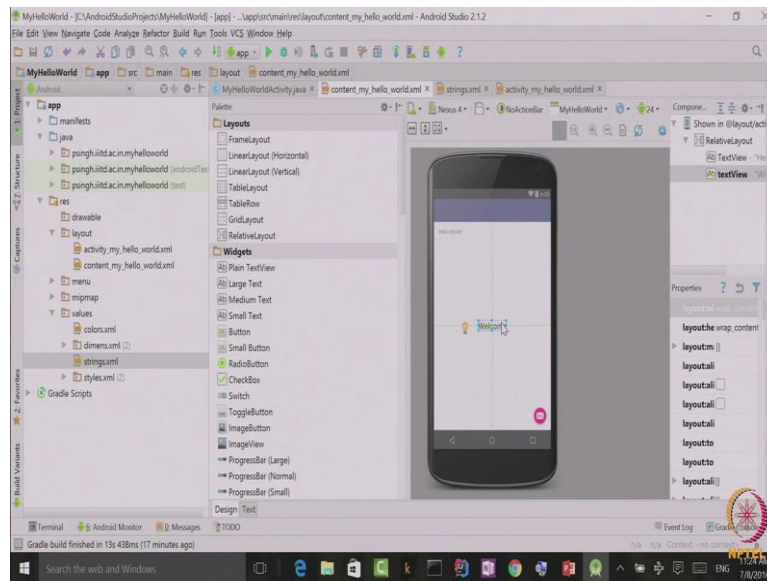




Okay yes, as you can see that as I am bringing my last text to drop my android studio is trying to help me by positioning the large text text box. Currently I am right in the middle of my android device and this is the place where I have to display it. You can see dotted lines which are showing that I am right in the centre. I drop my (wid) my widget. My widget currently displays the default message of large text. A double click shows me all the properties and single click on my large text shows me how to modify it.

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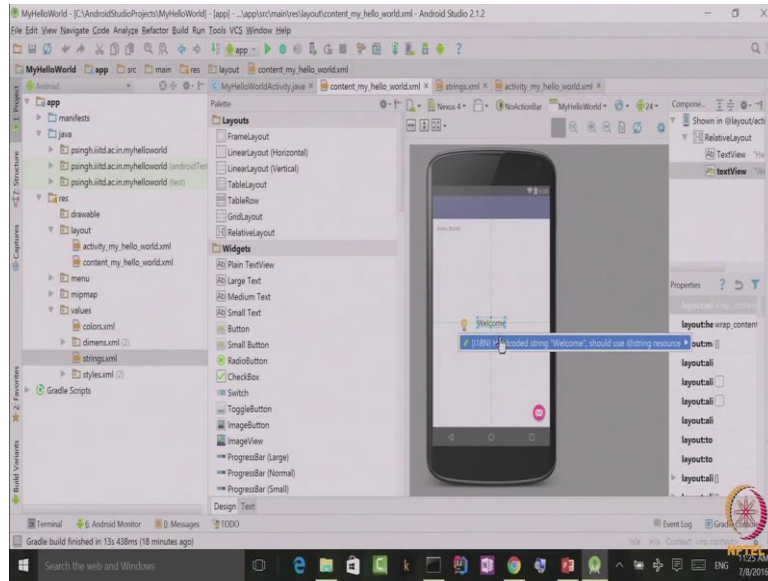




Yes, so as you see that now I can modify the text. I will modify it to a very simple welcome method. That is it. I have converted my message to a welcome message. Now you can see that there is small (val) bulb that has shown up on my IDE let us see what is it? This is our android studios way to help us in programming. Let me click on the bulb. By bulb shows a message which I will read to you.

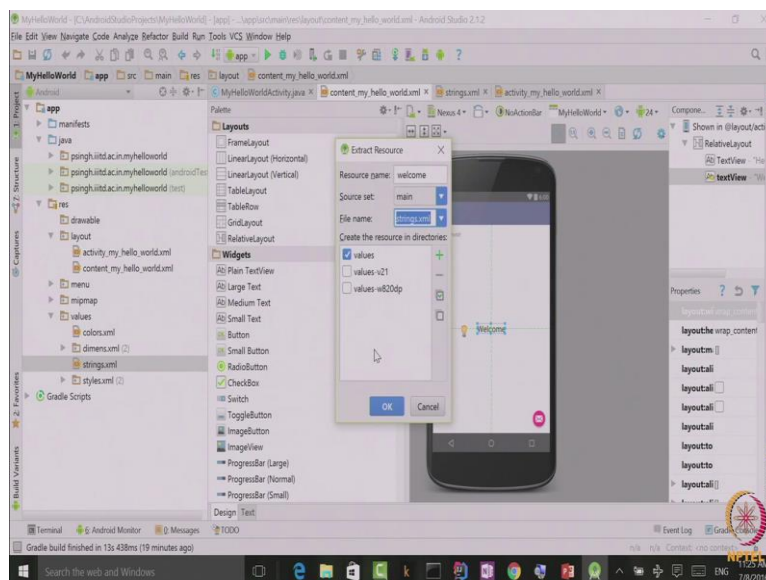
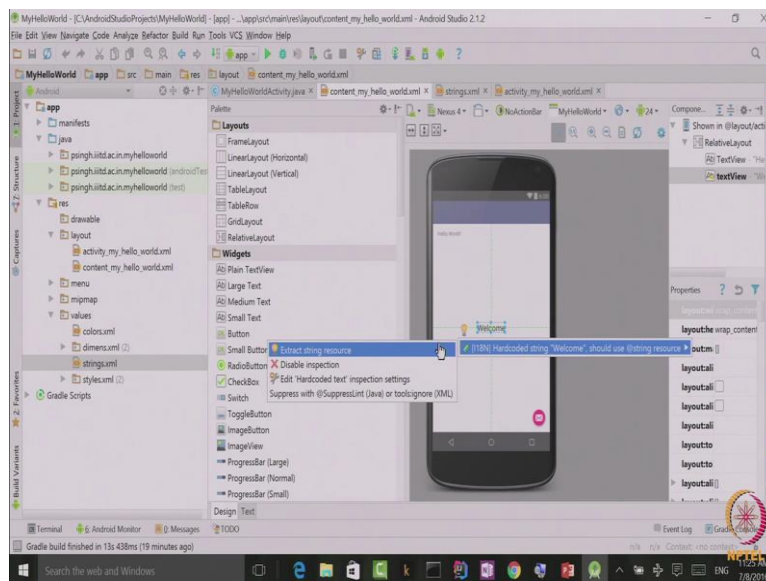
Hardcoded string welcome should use at string resource. And it shows a code which is starts with I 18 N. This message essentially telling me that if I use the welcome as I have used here this will be considered as hardcoded strings. And tomorrow suppose I want to display the same applications in Hindi where welcome means Swagatam. I will have a problem and I will have to change my program code. Instead a better approach is to use a variable which is currently assigned the value welcome and later on we can only change that value of the variable to another value. That we already know is a very good practice for programming.

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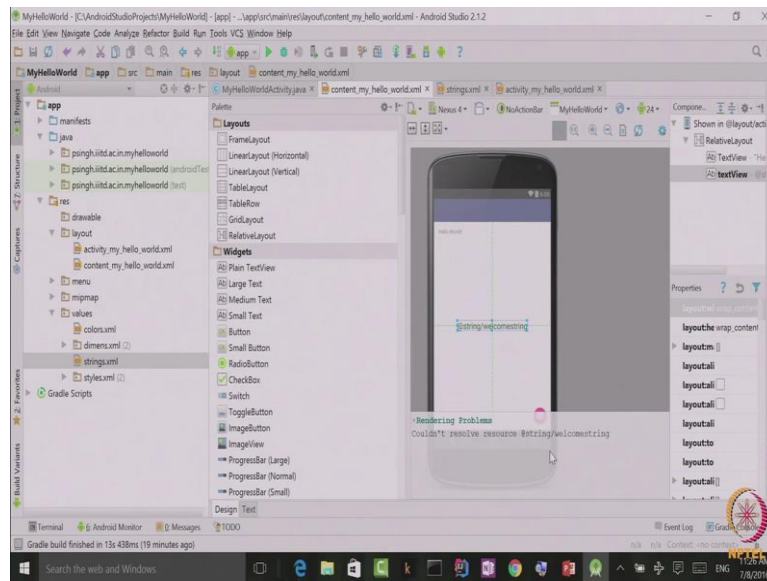
And this is what my android studio is asking me to do. Let's make that change, I have clicked on the message let me go back let me just show it to you again. My android studio shows me multiple options one is to fix this error by setting up as string resource and then there are other options such as disabling the inspection, suppress the warning, etc we will go with fixing the error.

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So I click on the first action and it opens. Now it is telling me that what should be my resource name. I will edit a suggesting me that my resource name can be welcome but because I know that this is going to be resource of type S string I will change my resource name to welcome string. After that I will press Ok.

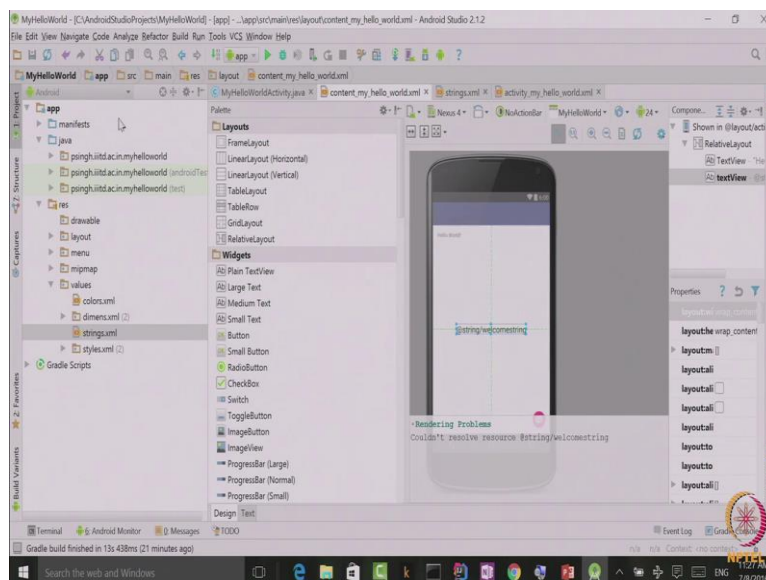
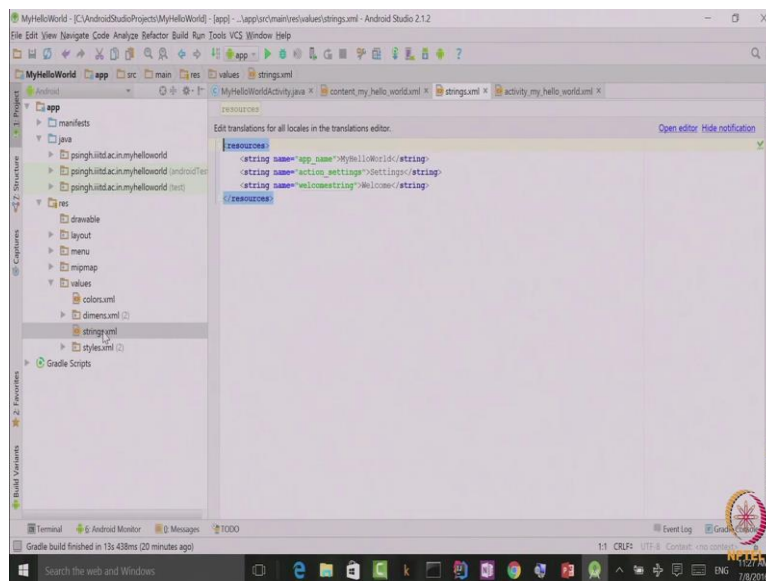
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Now you know that it is showing there is rendering problem could not resolve resource at string slash welcome string. Let's not worry about it for the time being. I will update it hopefully the error will go away if it does not then we will try to make some changes and then see that how the error goes away. Currently we are not worried about it.

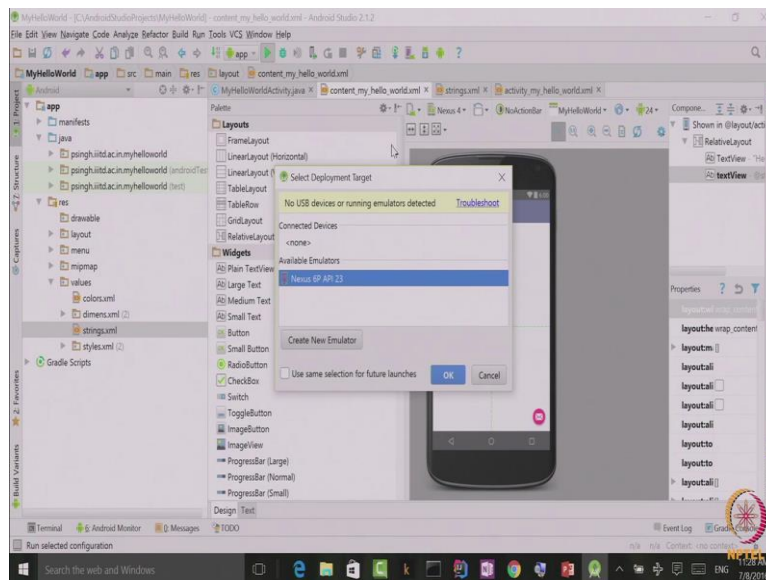
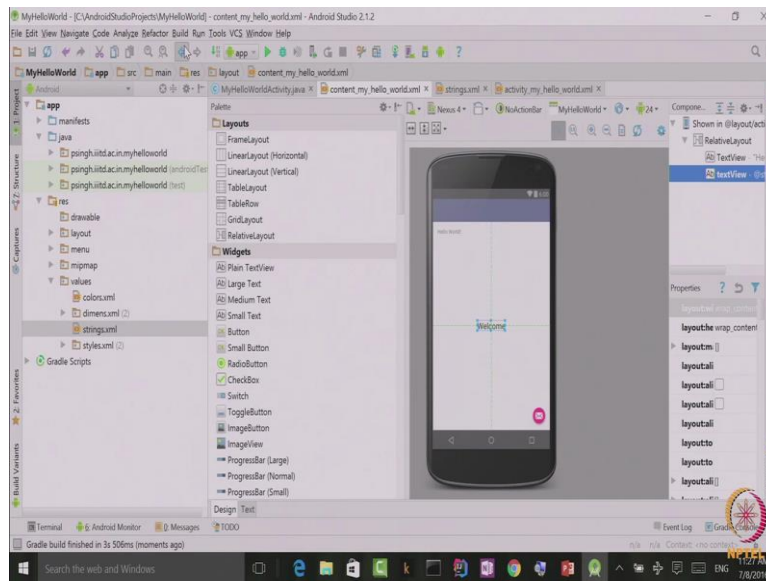
Now let us see where this string resource has gone? Can you make a guess? Earlier I have told you a folder called res. Res as told earlier stands for resources and stores all the resources. In your program besides the code whatever you have is what we called resource. So a resource could be an image, a string or any other thing.

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So let's see again we will go to the values. We will go to the strings.XML and now you can see there is another entry called welcome strings. This is the entry that we created earlier and what is the value of the welcome strings? It is welcome that we set earlier. We save and we update and we hope that our errors may have (gon) gone away. But it has not so let's just try to build our project.

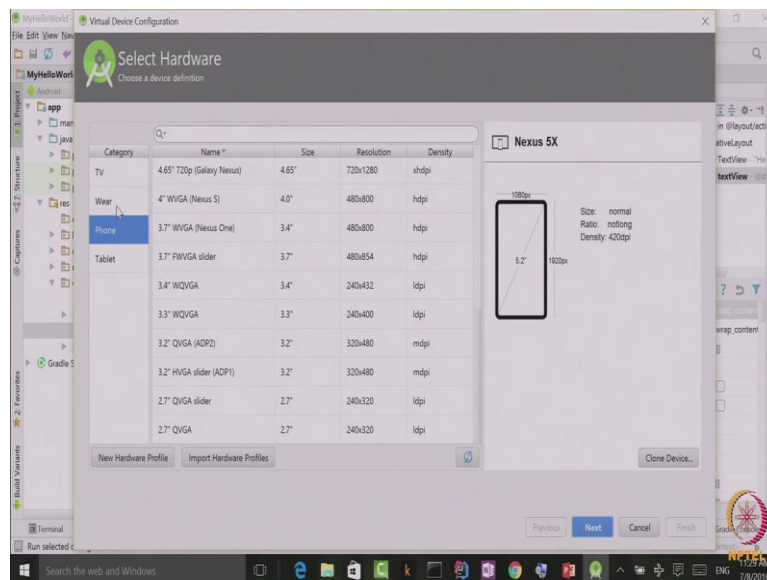
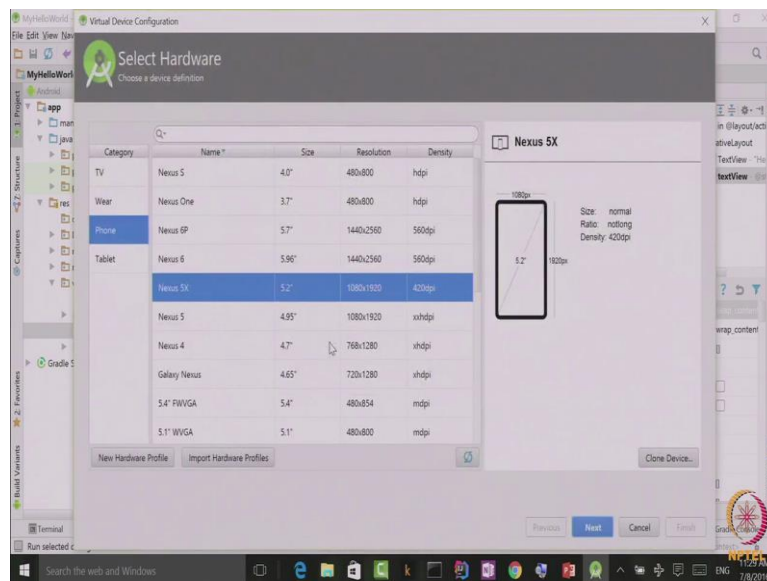
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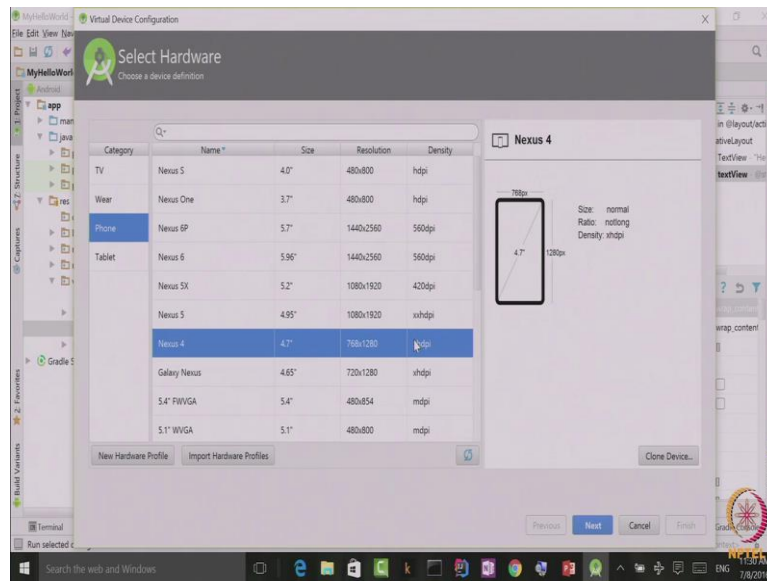


Now you see that our android studio has correctly found our reference and it is not showing any error anymore and we can see a welcome message. You may also be seeing hello world message on the very top this is something which android does automatically. We can remove it but for that time being we are letting it to be where it is and we are only consults about the string that we have added. Now our first program is almost complete so let's try to run it.

When I try to run it my android studio asks me. What is my target? Is my target a real device? Or is my target an emulator? As you may see that I have already created an emulator if you have not created an emulator then both of the entries will be blank. There is nothing to worry about you always (hap) have an option to create a new emulator. Let me create a new emulator.

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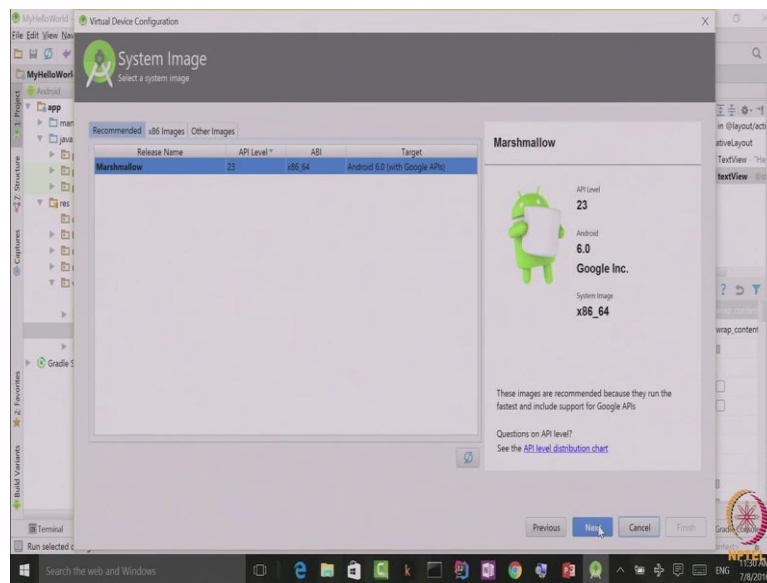




I will press and android will give me multiple choices. You can see that I can create emulator for a TV, for a wired device for a phone or for a tablet. Currently we are only concern about the phones. As you may see that it is also giving options of all the nexus devices that have been released in past and then some other fall factor devices that are released by other manufacturer such as Samsung, HTC, or any other android manufacturer.

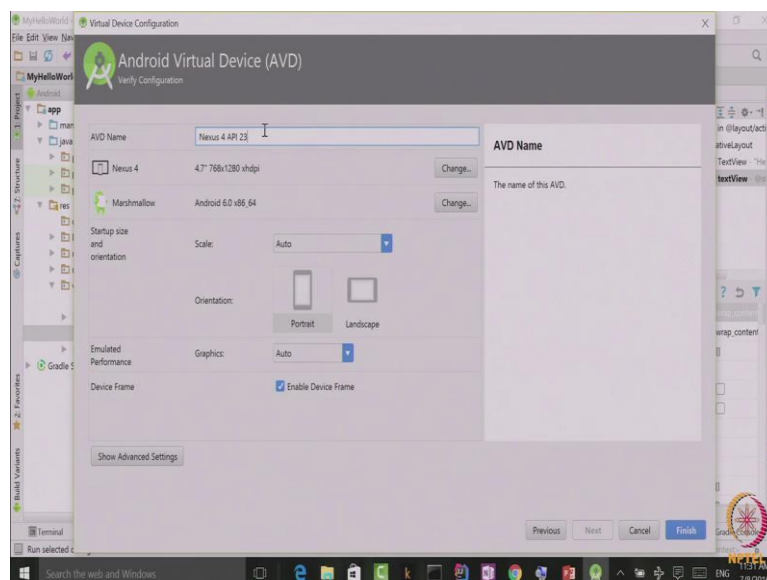
I can also create my own custom device for the time being we will just go with another nexus device. So already have an emulator in this system for nexus 6P. I am choosing an emulator for nexus 4. Currently I will go with all the default options. Please note that you can change any of these options and you can create your custom device in fact you can create custom emulator for a device which may not yet adjust and which you may want to build yourself.

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Android studio gives us that choice so let's create an emulator for nexus 4. Press next, I choose the SDK you will get multiple options for here as well. Because I have all only installed API level 23 it is only giving me that choice but I can always download more SDK and I can choose any SDK that I want. Essentially android studio is very flexible in creating an emulator. You can choose the form factor of the device you can choose the SDK that that device is running.

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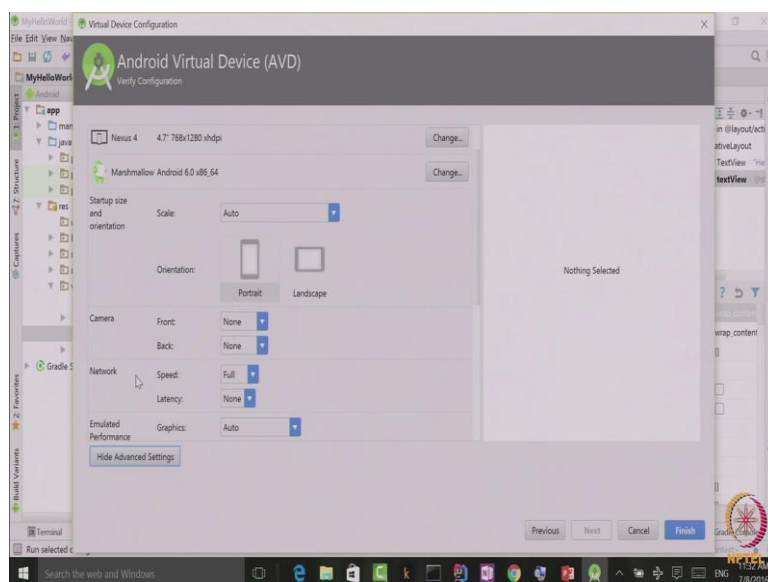
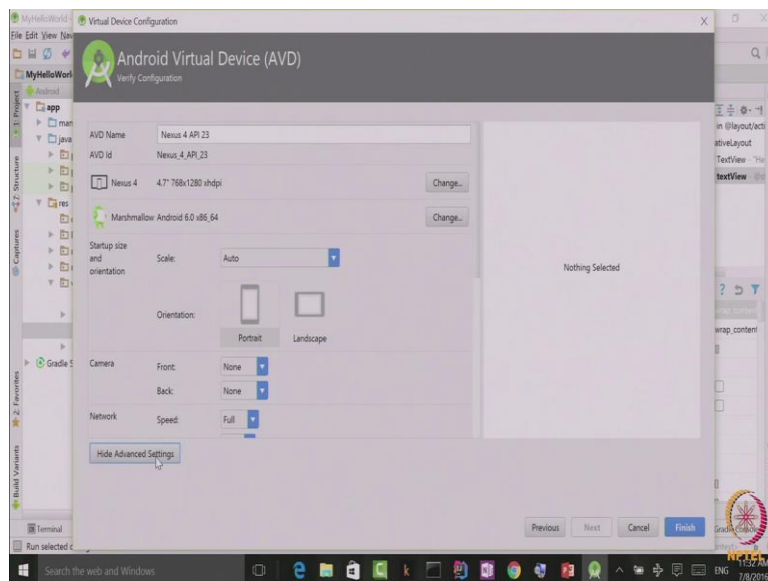


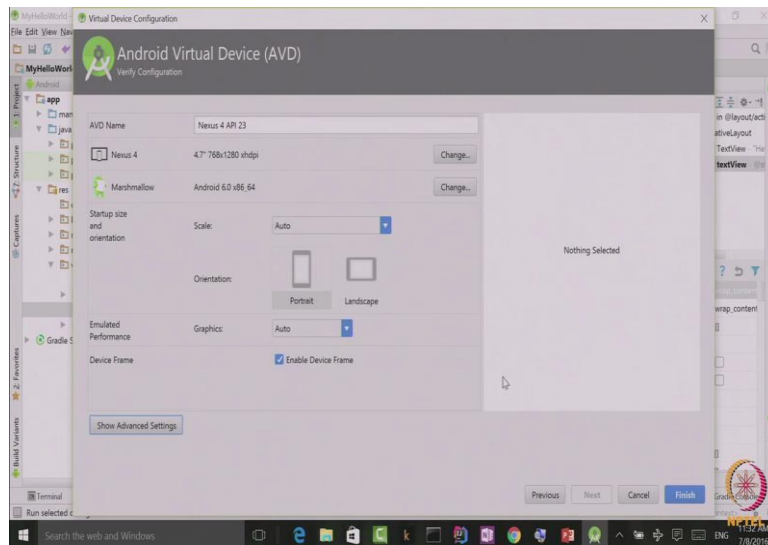
For us that work is almost done. After that the next screen shows us (wa) how we would like to name our emulator for our android virtual device. I name it with the default name suggested while android the purpose is that it shows me what kind of device I am choosing

and what is the API level on that device? You may want to change the name to something more familiar such as my phone or Samsung phone or HTC phone.

However I preferred to choose it by API name because by that just by looking at the emulator name I know what kind of API I am deploying my application to. You can choose the orientation of portrait or landscape lets currently choose only a portrait. Then there are multiple other options are available as you can see am not going to change anything from the default.

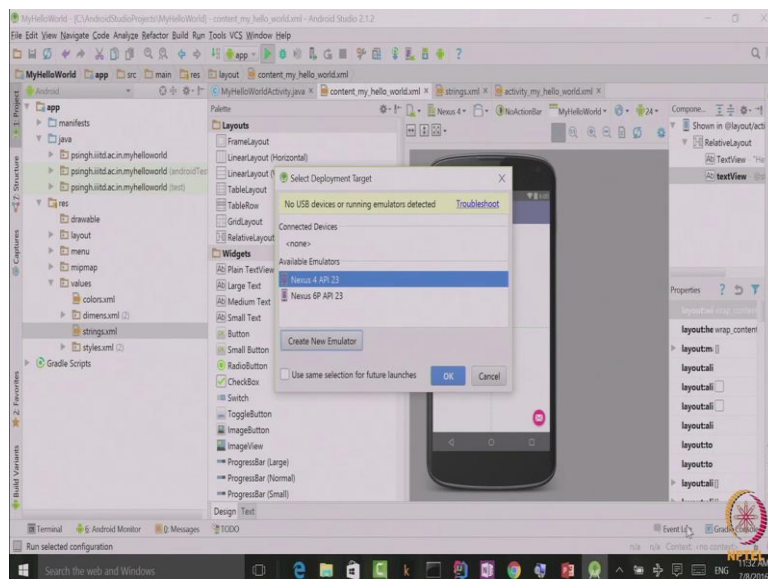
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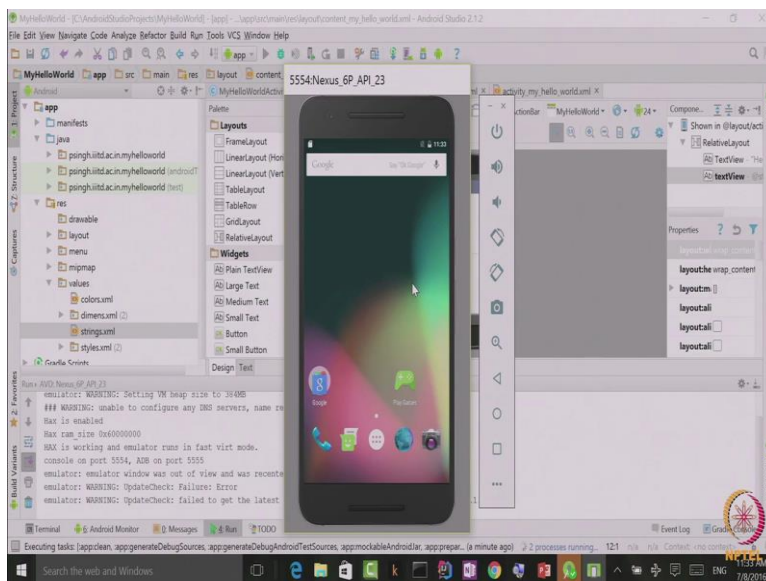
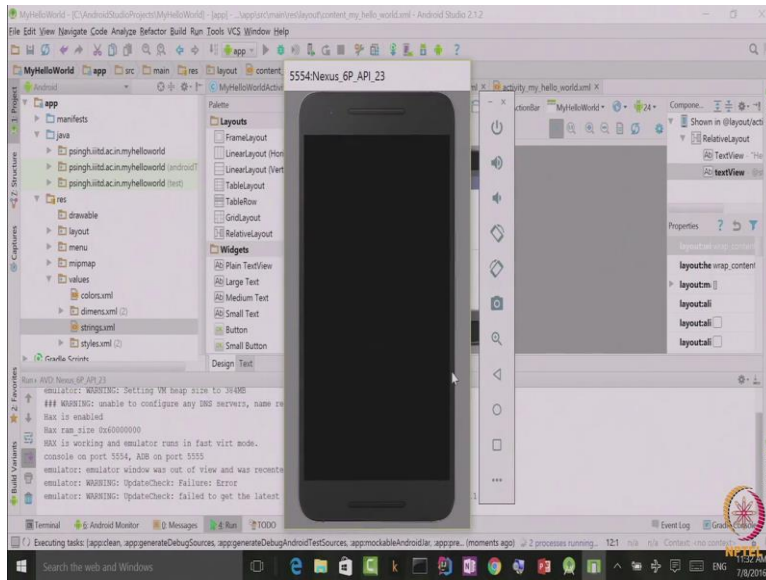
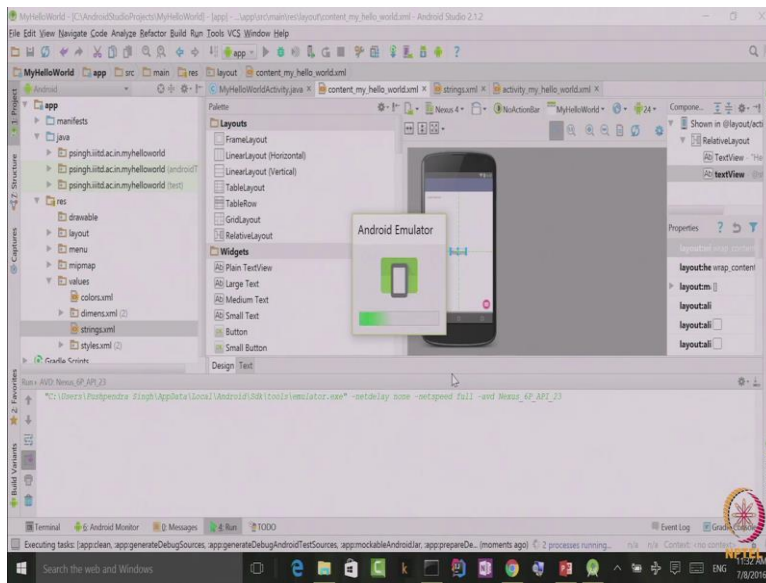
There are also some advanced settings you may click and you can see that yes, camera, network, graphics everything is available for you to change and customize your device for the timing we will not change anything. We are just going with the default options and we will press finish.

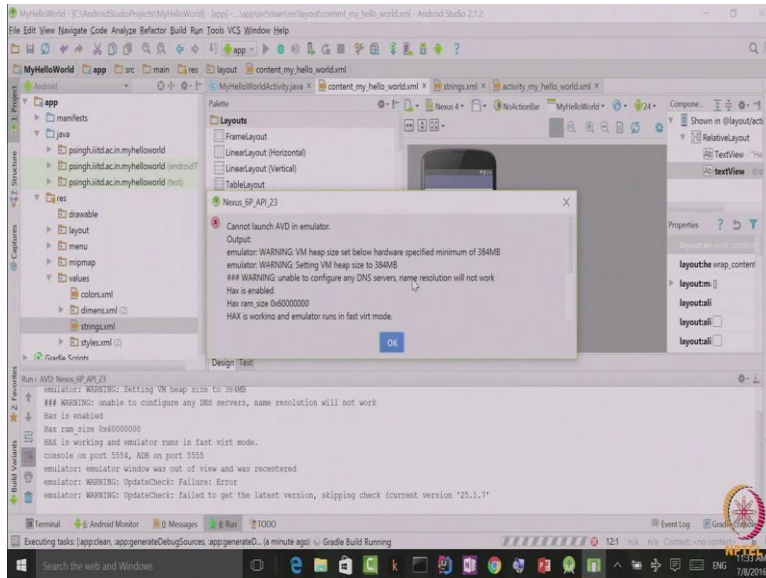
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When I press finish you can see that android studio has added a new entry into my available emulators. Now I have a nexus 4 emulator and I have a nexus 6P emulator. Let's choose nexus 6P and let's press Ok.

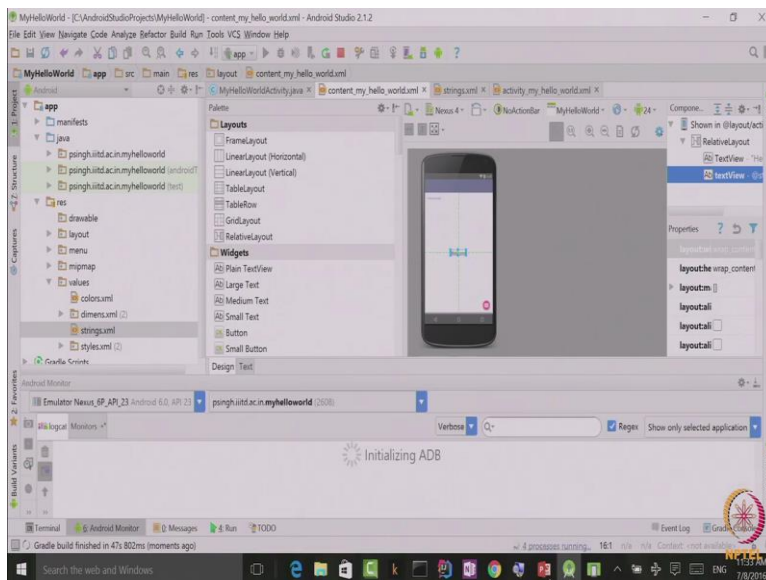
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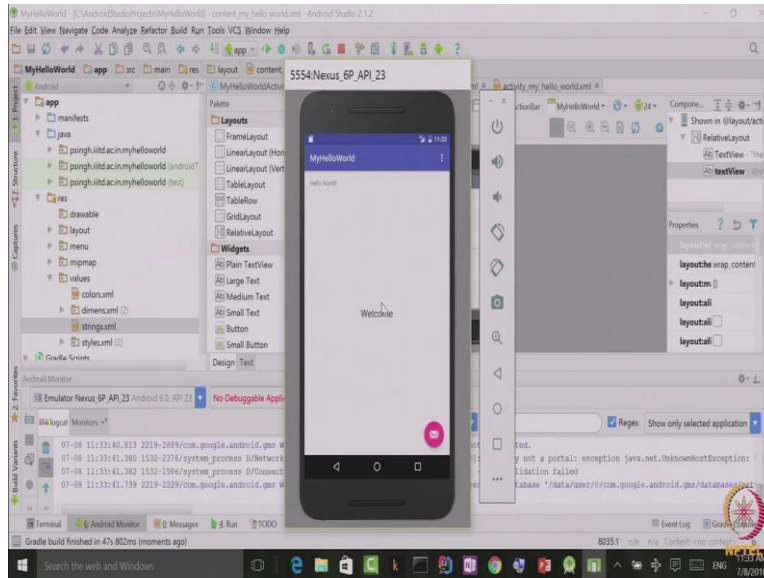




The moment I press ok android studio launches my android emulator as you can see on my screen and very soon it will deploy the application that we have developed on my emulator. Let's wait, as you may see on your screen it is currently equivalent to switching on your phone. The first time you start an emulator it takes some time. You see the basic screen of android that you see when you get your phone. Oops we got an error, cannot launch AVD in emulator. Emulator warning so apparently my tablet is not able to provide n of its sources.

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Let's see, hey, so this was just a warning as you can see that now my application is deployed you can read the welcome message. That is coming this is exactly how your application will look like when you run it on a android device. So congratulations you have created your first application and you have deployed it successfully on an android emulator. We receive some warning but they did not affect our deployment. Now in the next tab I will connect my android phone to my tablet and then we will try to deploy the same application on my android phone.