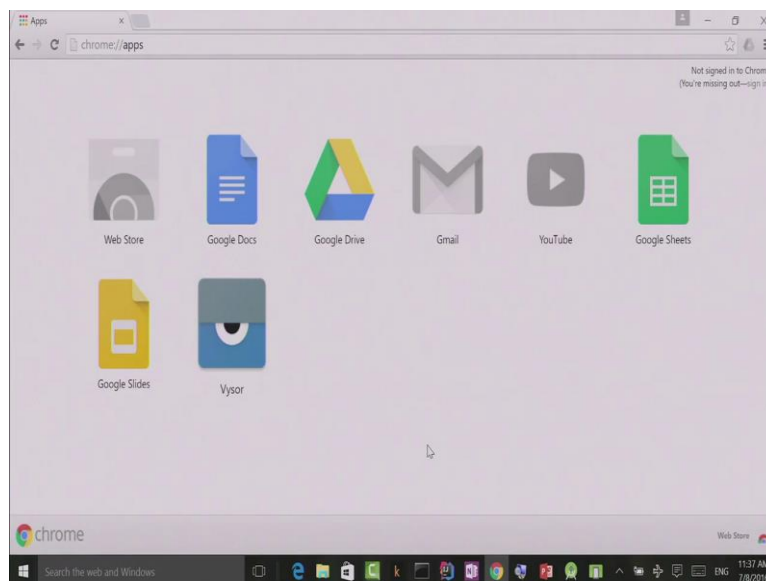


**Mobile Computing**  
**Professor Pushpedra Singh**  
**Indraprasth Institute of Information Technology Delhi**  
**Andriod Development**  
**Lecture 08**

Hello, in this lecture we will deploy our application to an android phone. I am holding a nexus 6P phone this is (0:12) the latest android phone. You may try to deploy the same application on your android device. Please note that for the current application I chosen the API level 23 if your android devices slightly older please compile it with the appropriate (ap) API level before deploying it on the phone.

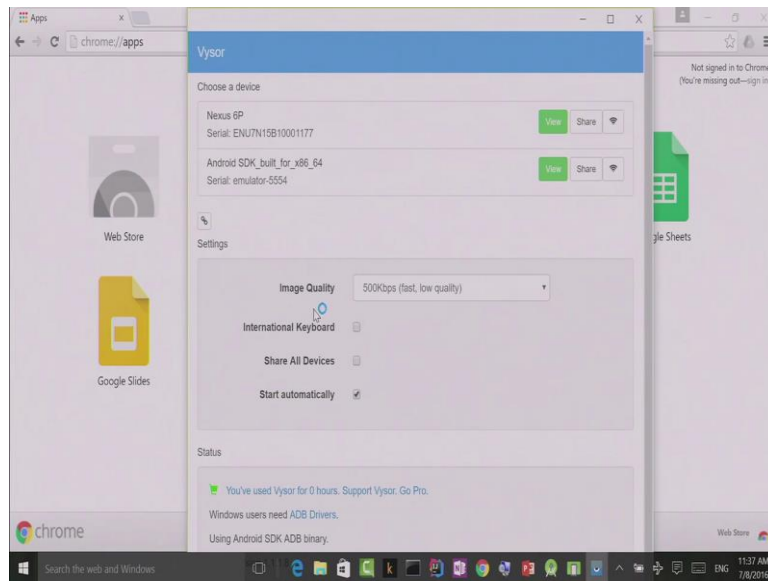
Today in the lecture I will show you how to deploy it. All we need is your android phone and a USB cable. I will connect the USB cable to my PC at one end and I will connect it to the other end to my android phone. We also need to do certain settings on our android device before we can deploy an application to an android phone. Once I have connected my phone I will show you those setting. Now my phone is connected.

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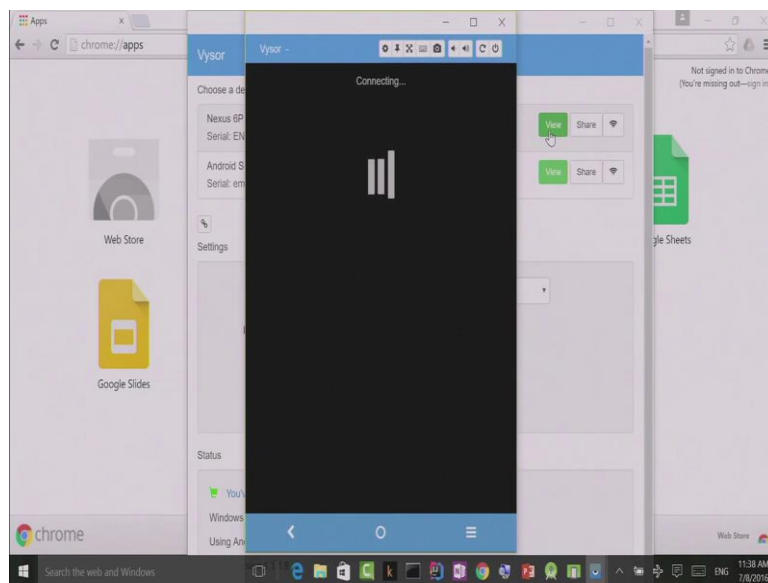
I have installed a software in my chrome browser which called vysor. This is a chrome app the advantage of the chrome app vysor is that it allows my physical phone screen to be shown on my PC. So let me launch visor app. This is freely available so all you need is download into your chrome browser.

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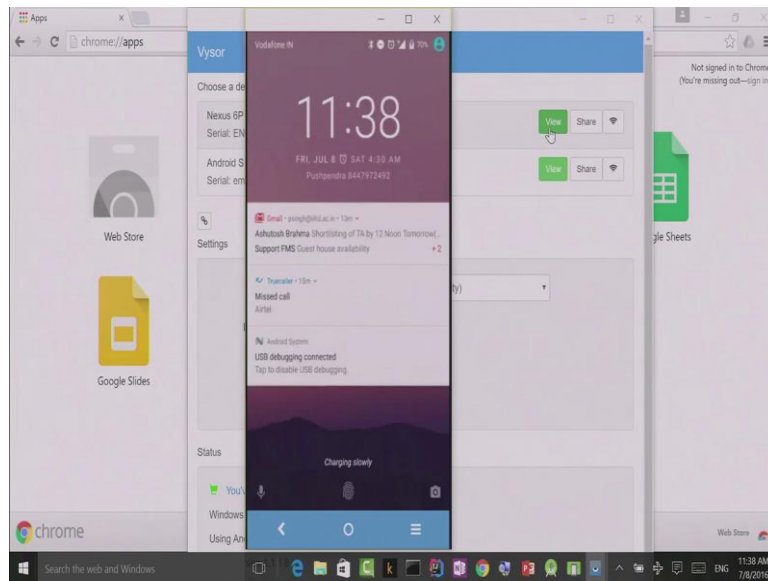
Let me start. As you see my visor app has caught my actual nexus 6P phone and it has also called the android SDK emulator that is currently running from our last example. I would like to see the screen in of my nexus 6P phone.

(Refer Slide Time: 1:56)



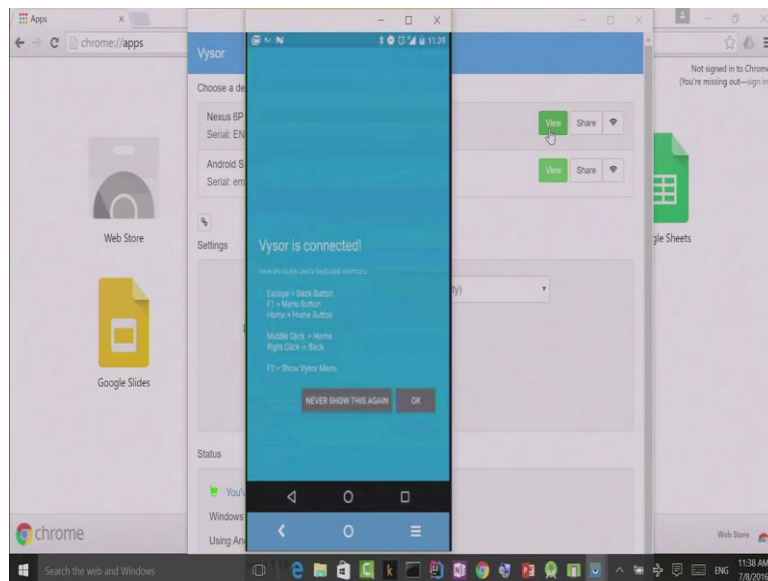
It's trying to connect.

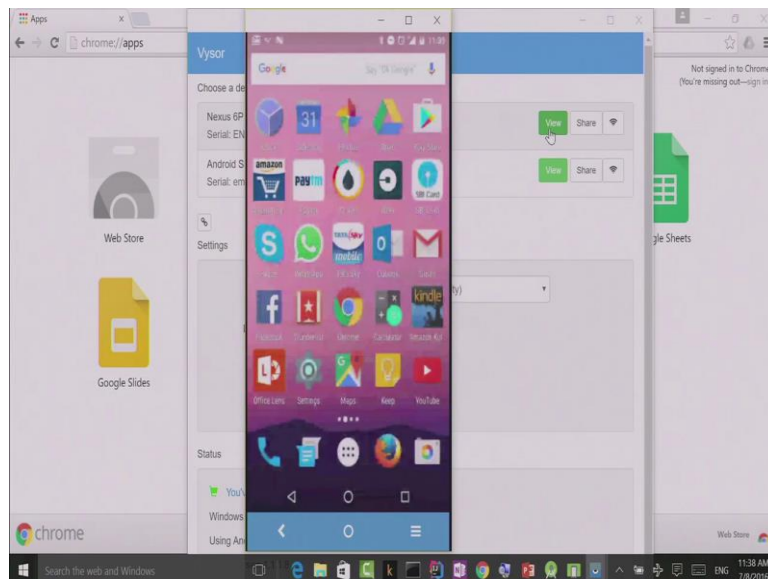
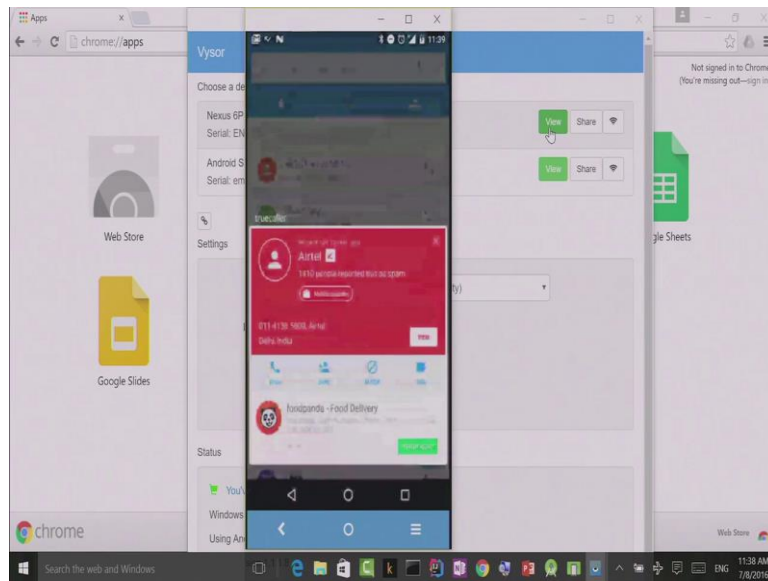
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And yes here now my screen is available on my PC you may see that some of my notifications are there. Let us get rid of them.

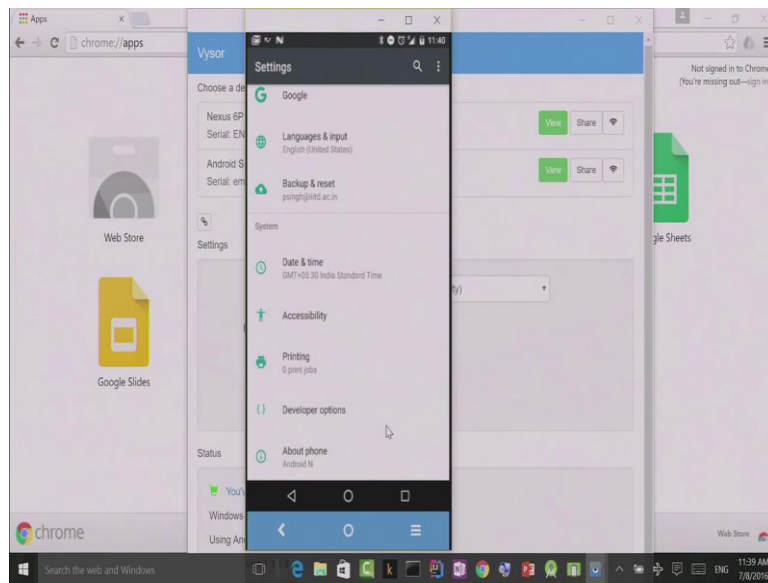
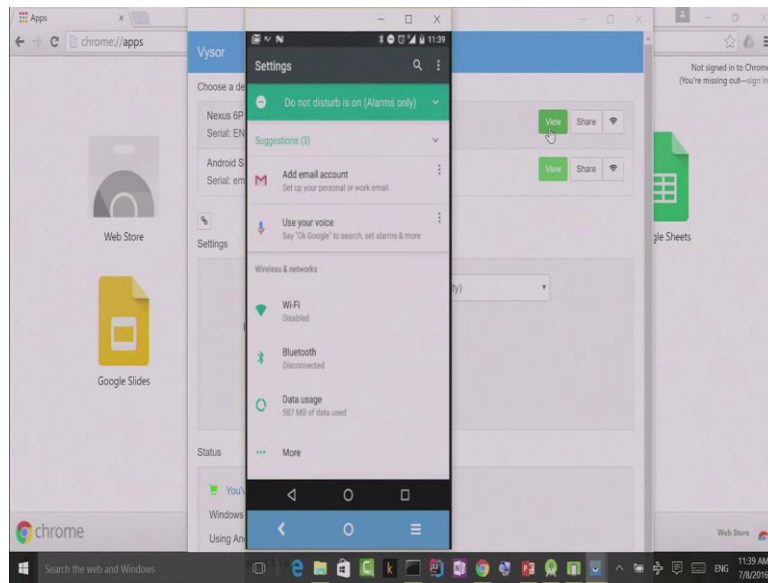
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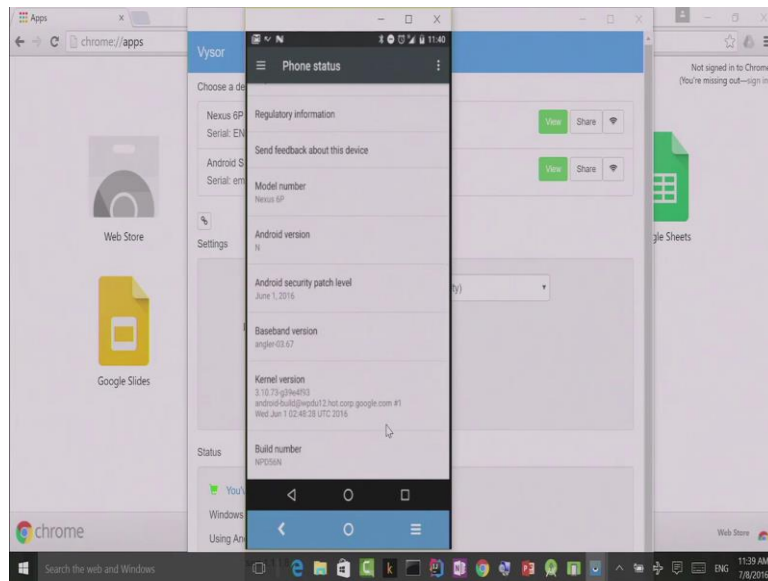
Shows that the vysor is connected we will press ok. We will go back to the screen of the phone. That's all fine, first let me display use the setting that you need to do if you want deploy your android application to an android phone.

(Refer Slide Time: 2:36)



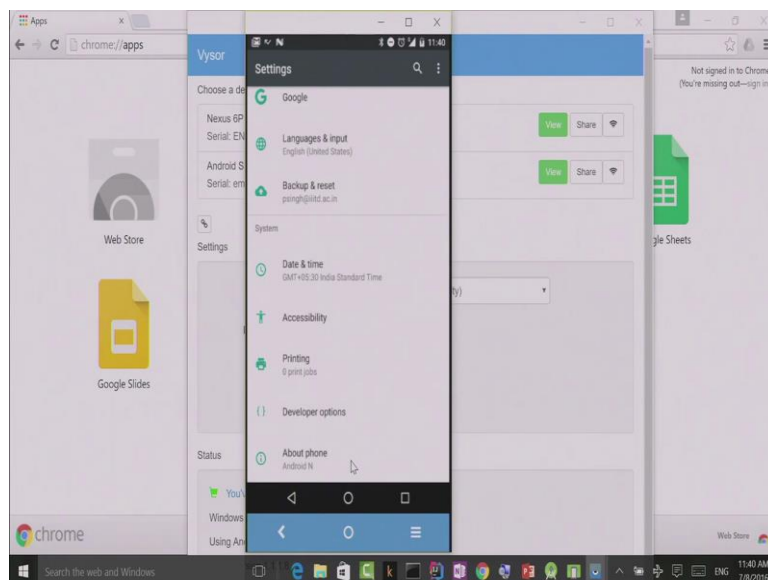
Go to the settings, please note that the settings have been changed from nexus 6 to nexus 5 to nexus 4 and you may see a different window when you open the settings. However all of this will have an entry called about phone. In my phone you can see that just above phone you can see something called developer options. If you are connecting your android device first time you will not see this. In order to see this for a newer android phone you will have to go into the about phone.

(Refer Slide Time: 3:15)



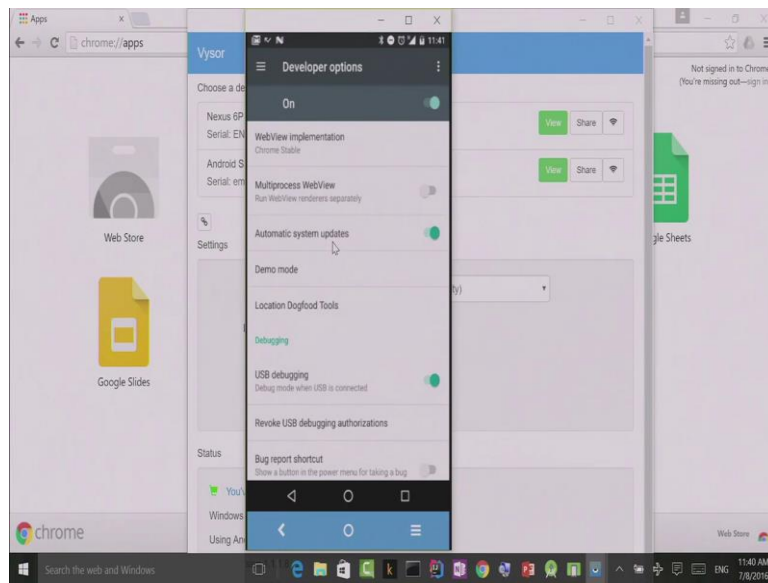
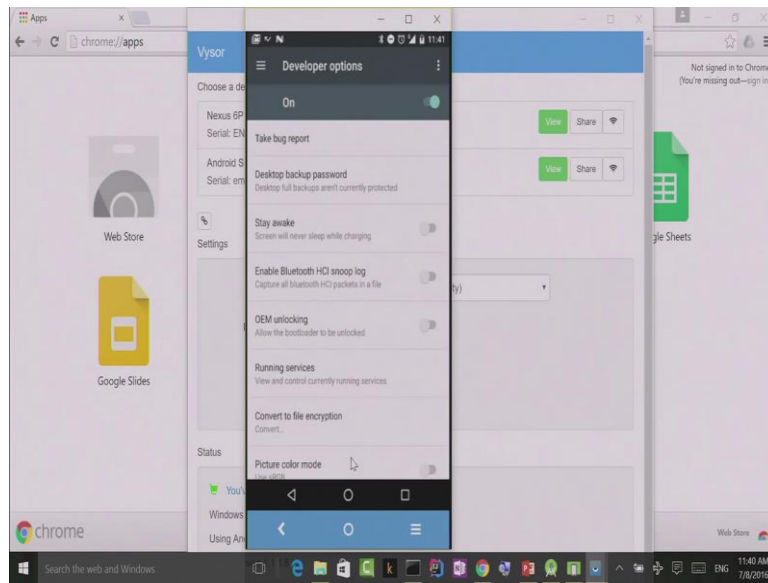
In the about phone you will see an entry called build number. You have to press this build number you have to tap it actually not press. You have to tap the build number 7 times to make your device available for development options. I will repeat, if you are not seeing developer options then tap the build number 7 times 1, 2, 3, 4, 5, 6, 7 the moment you have pressed it 7 times the developer options will come alive.

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In older android devices you will actually directly get an entry for setting it up as a development device. Which you can select as yes and they have developer options will come up. Any way I have set up my devices for developer options. I can see that is up.

(Refer Slide Time: 4:12)

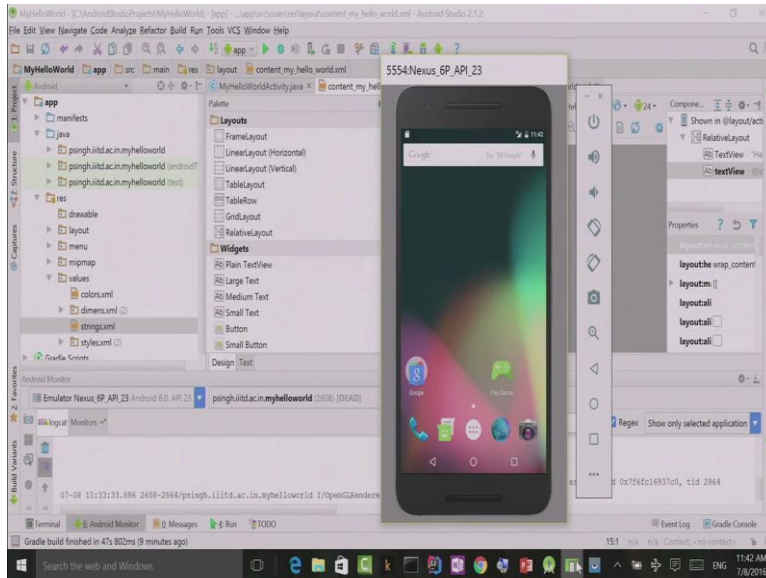


Let me press on developer options and see what are the options available. As you can see there are multiple options that are there slowly we will develop and understanding for them. For the time being all I want is two options to be available to me one is automatic system update which allows my device to receive system update automatically another is to enabling USB debugging. As you can guess from the name it means that as soon as I connect my device (int) using a USB cable the debug mode is available.

The debug mode is a mode in which you can easily debug your applications before you develop a product ready application. So these are the only two options that I made available. Second is that I have just said that verify apps just help me to protect from harmful behaviour

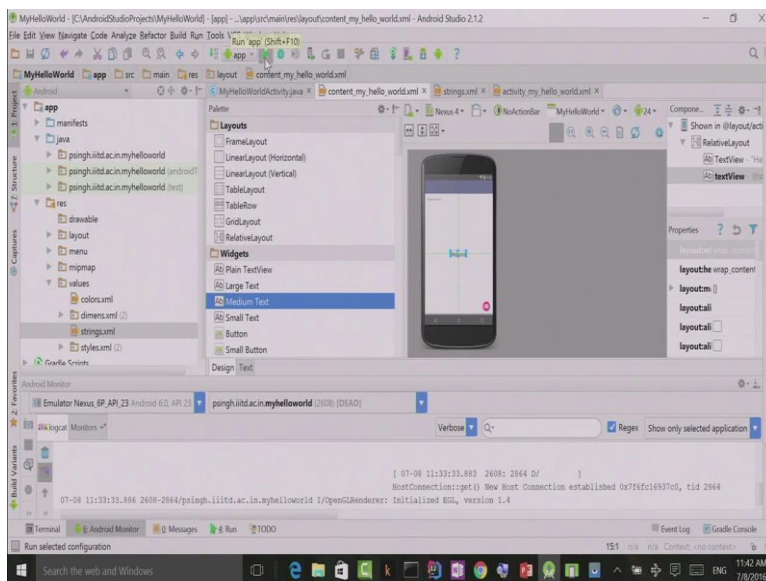


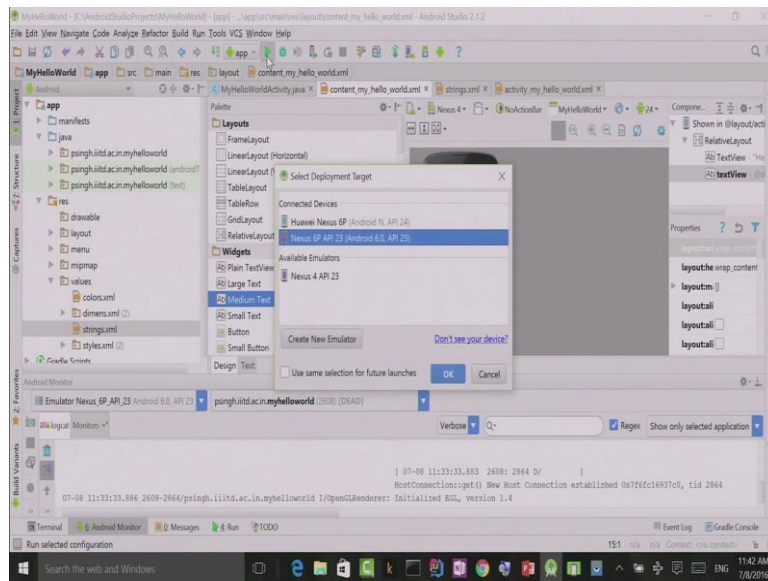




Let's go back to our android studio. Please note that I have stopped the app. Our emulator is still running but it is no longer showing the app. I will not close down my emulator because next time when I want to deploy my application on the emulator I do not want to waste time in a starting an emulator again.

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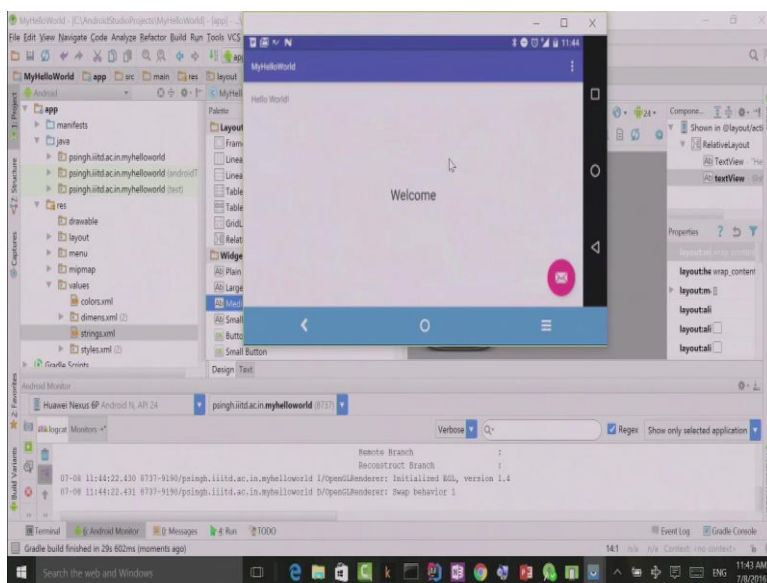
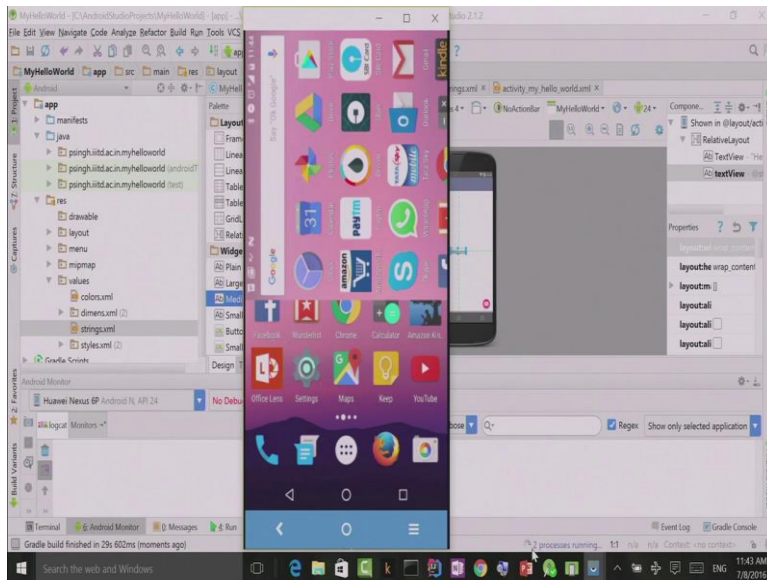
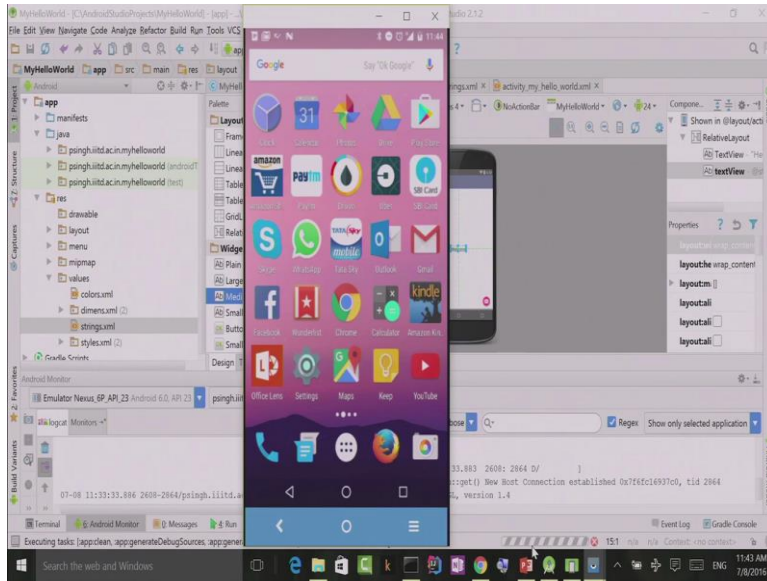




Let's go back, this time when we press run instead of choosing an emulator I am going to choose an actual device. My connected device is (00:06:43) nexus 6P. I press ok. You can say that android build is now running and hopefully very soon my android phone is clean should display the application.

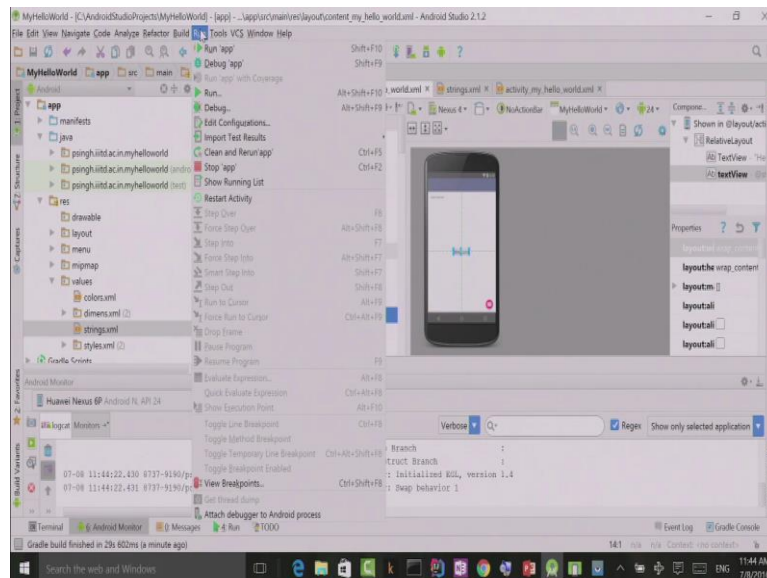
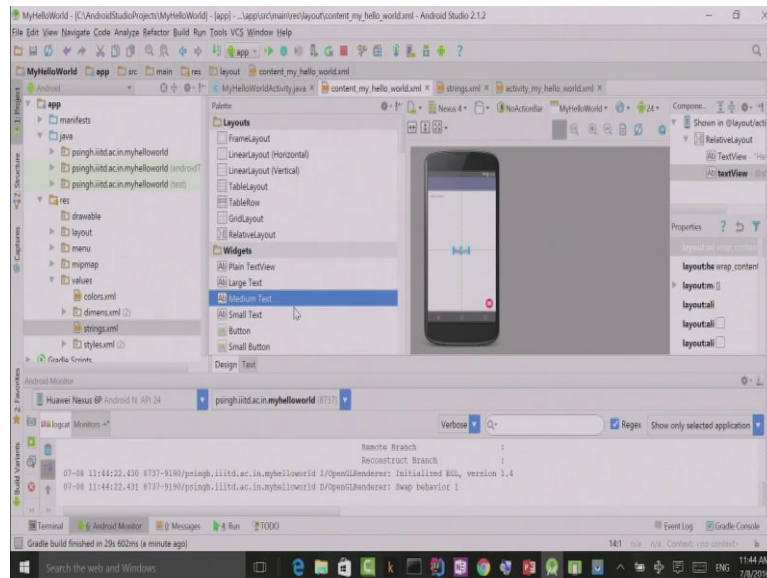
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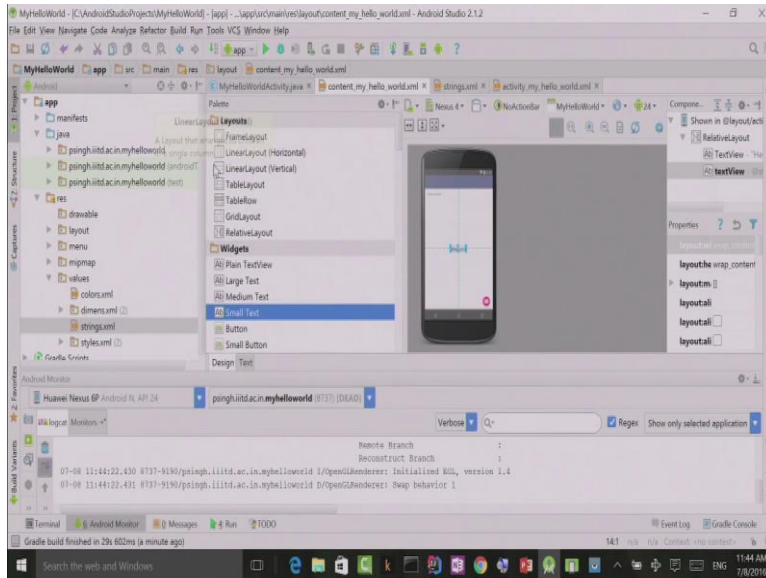




Let me put my phone screen up. So for not but we can see the build is running. Just wait. Welcome so yes we have deployed your android application to an android phone this is equivalent to your hello world programme. You will make some changes into our application both from the GUI and by also changing the string ((7:50) but yes this is your application which is available on your android phone. Just like many other applications.

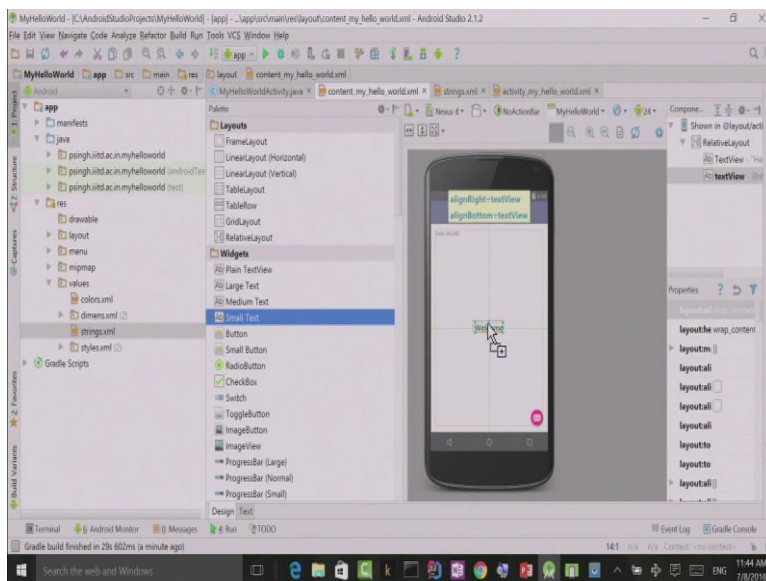
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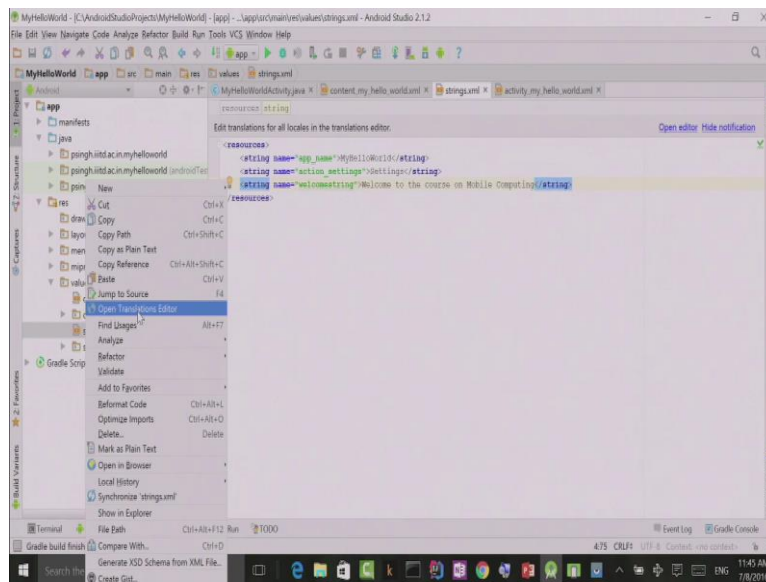
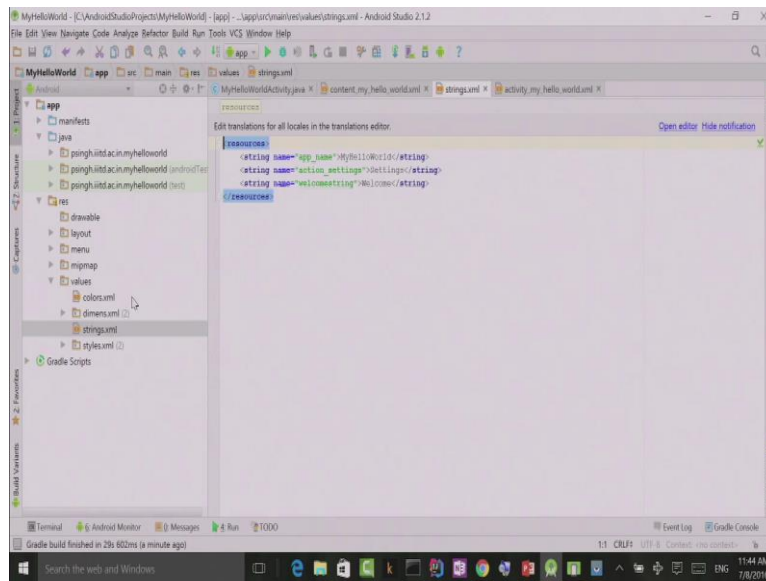




Let's go back and now try to change few things. First let me stop the run. (())(8:12)

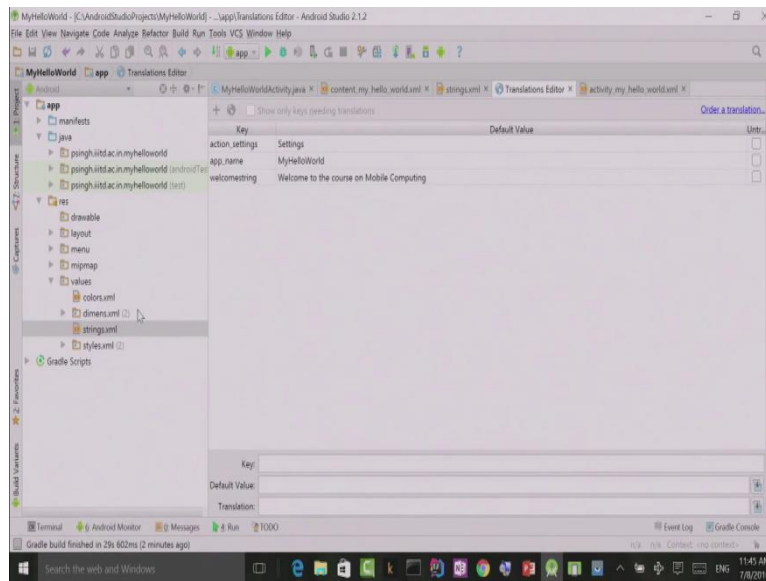
(Refer Slide Time: 8:23)





So let's change this welcome message some other message. I can change it here directly but I would prefer to change it here. So suppose I change my welcome message to welcome to the course on. If I click on my strings.XML with a right click you see that my studio shows me multiple options. One of these options open translations editor.

(Refer Slide Time: 9:11)

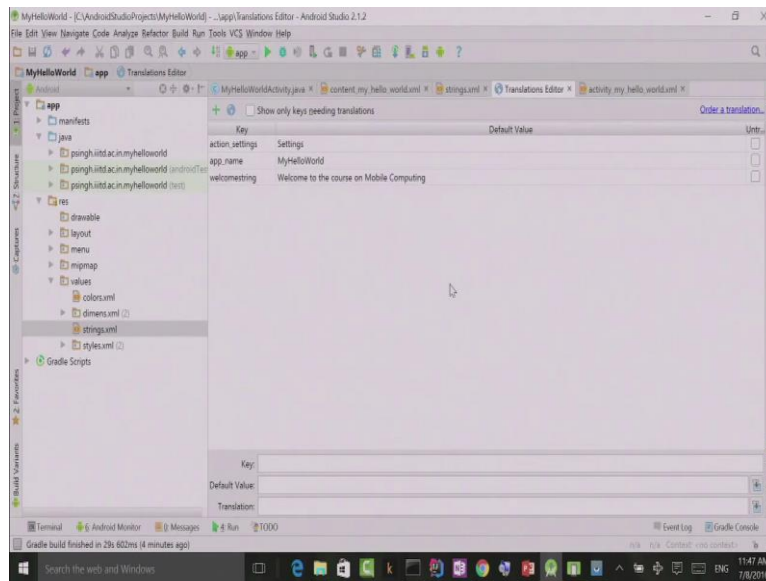


I click on open translations editor the idea behind open translations editor is that I may want to deploy my android application in different region of the world. For example I want to deploy my android applications to let's say France or Germany or even in India in different parts where English may not be the spoken language or Hindi may not be the spoken language. As you can see that it is showing by strings that I am using in my program and it is giving me an option to order a translation.

If I click on this link it will take me where I can order translation of my strings in to another language. The idea behind using a string resource instead of a hardcoded string is that I can pass my resource file to a translator of let's say French language. Who will convert my resource file into French language then I can import that new resource file into my application.

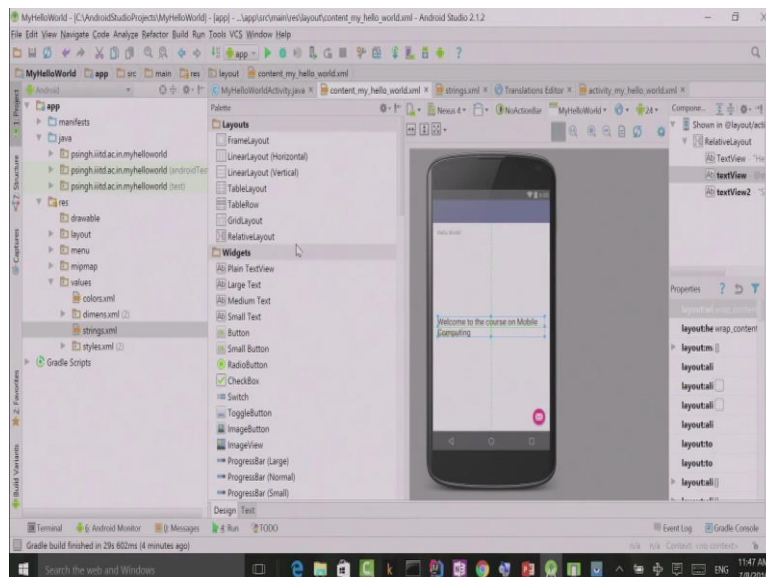
Without changing anything in my application code and now my application will display all the messages in French language. If you remember the small light bulb which you were seeing in the beginning when we added our welcome string and it gave the error which started with a I18N code this code refers to that if you use hard coded strings it will make problem in the internationalization of our application.

(Refer Slide Time: 10:55)

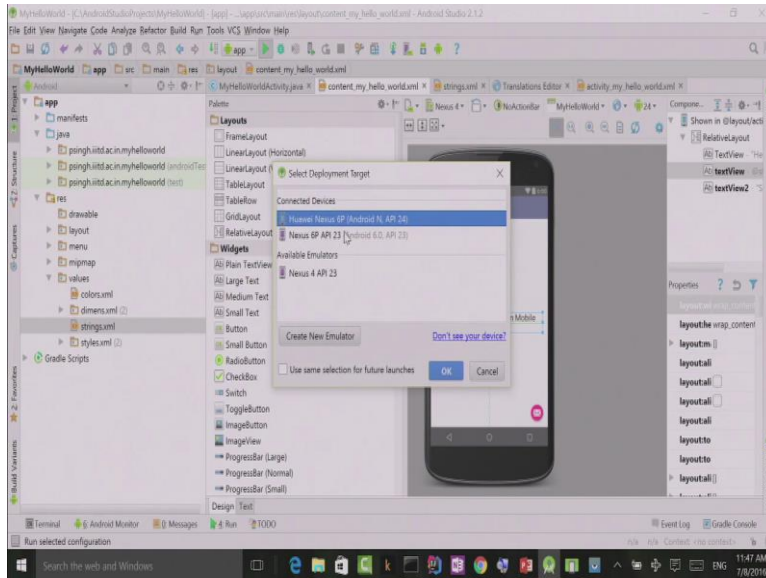


Now you can see that how that works? In android I can simply choose my resource file get it converted. I need not to change anything my application and now my application start showing messages in a completely different language. First let's check whether our application is showing our new message or not?

(Refer Slide Time: 11:13)

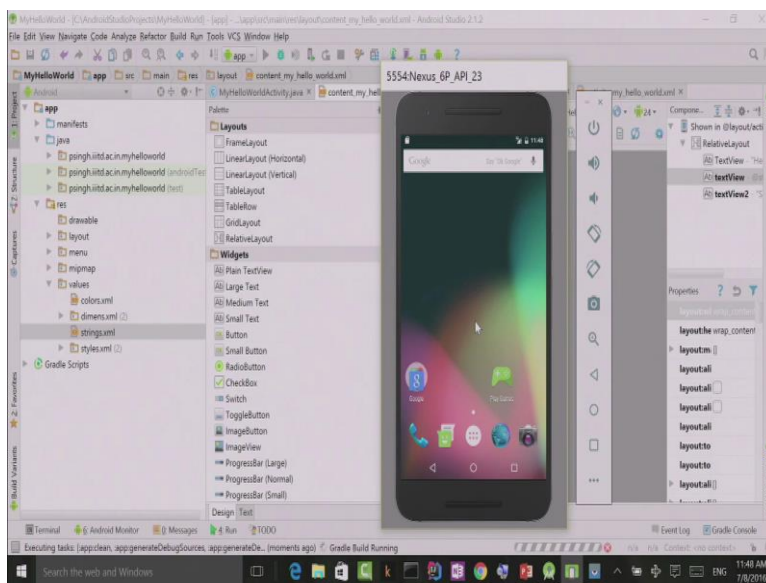






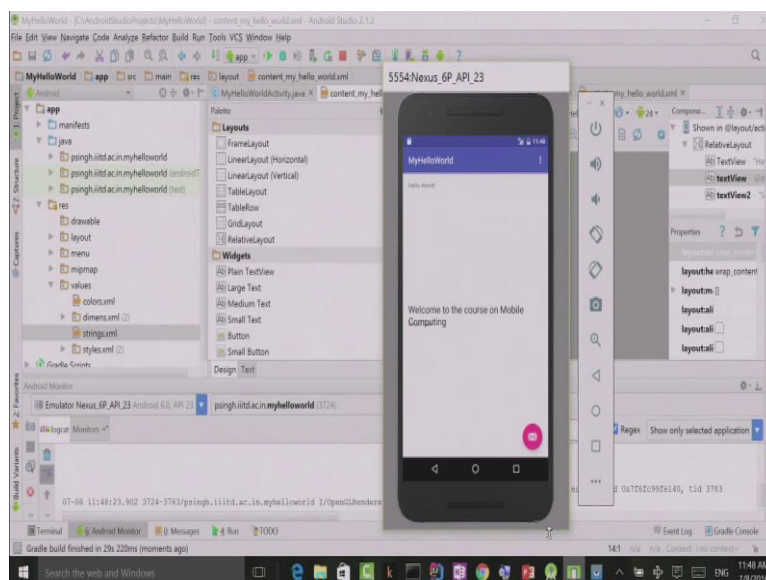
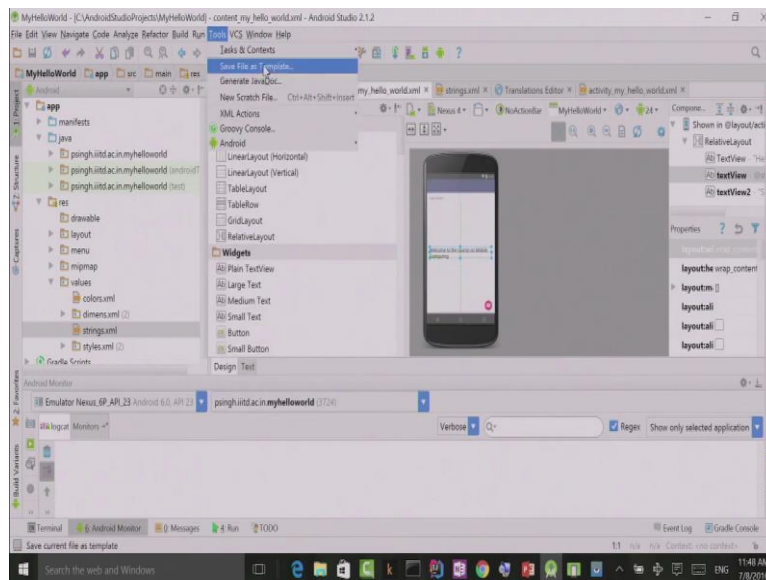
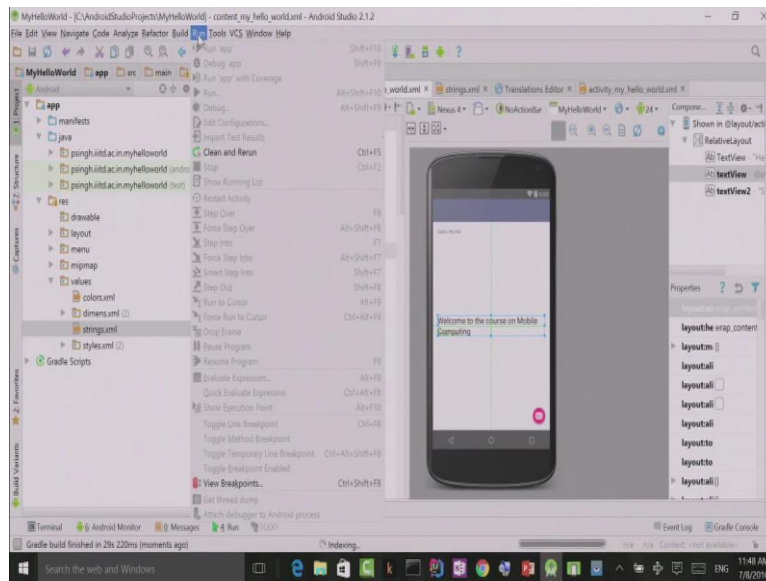
It is. Now let's just deployed it very quickly to the emulator that is already running or to the mobile phone (we can) I am just choosing an emulator.

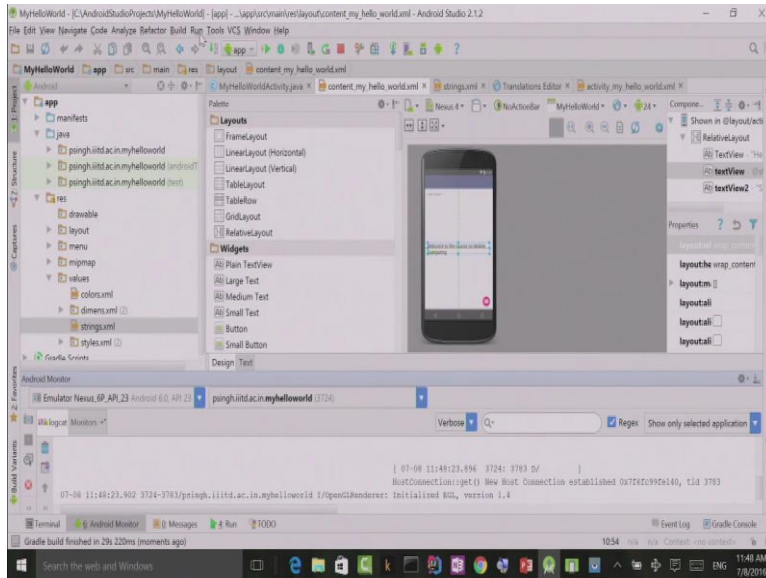
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You can see the build is running.

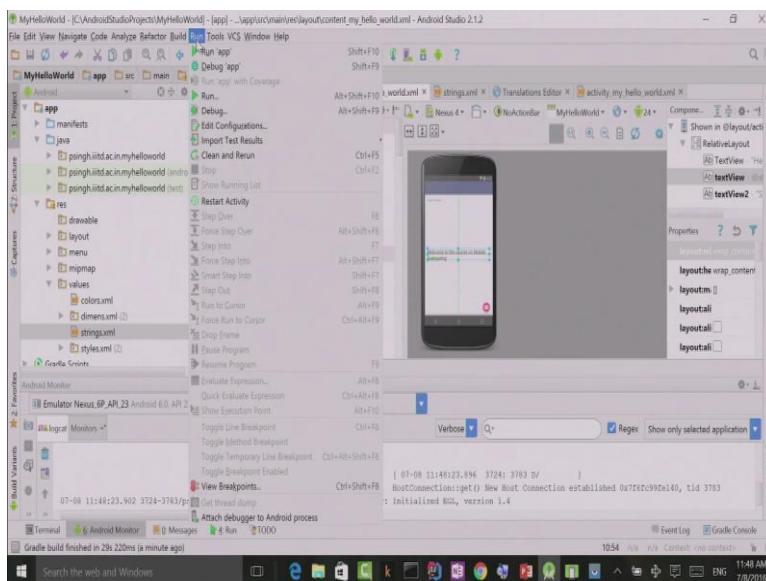
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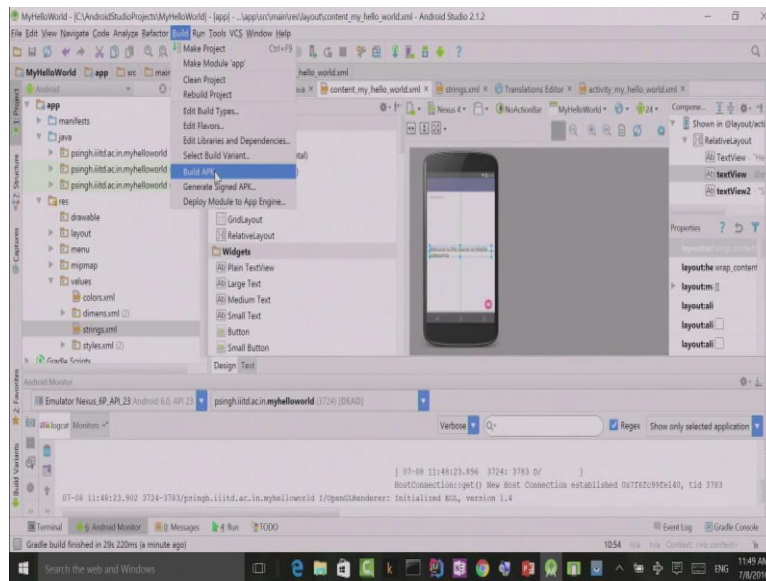




Now my application changed it showing me the new message. If you are frequently changing then you can go here and you can see there are different options which are available.

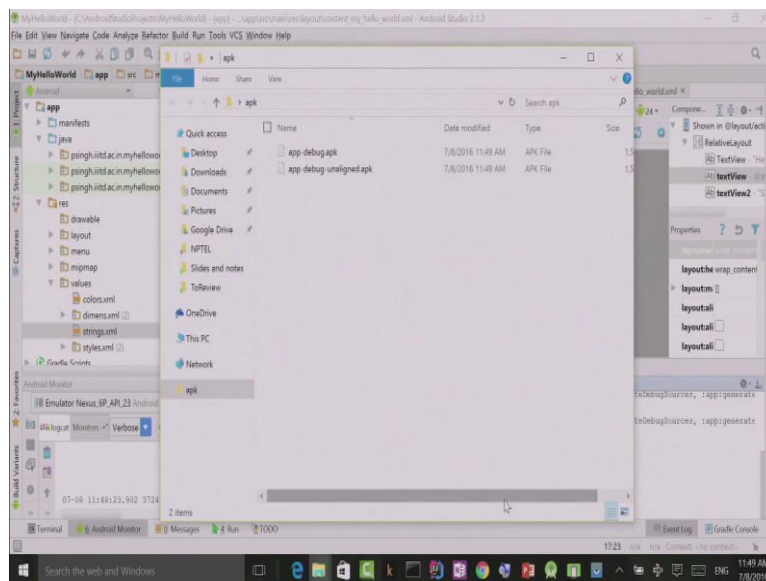
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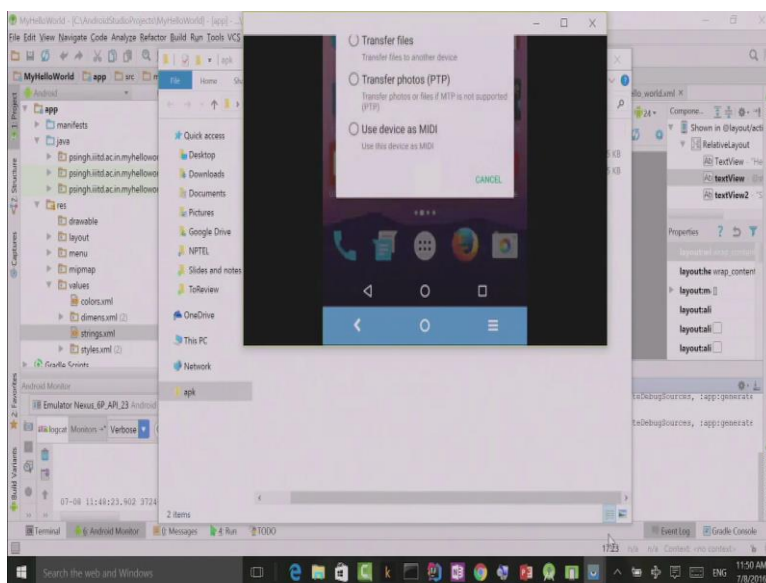
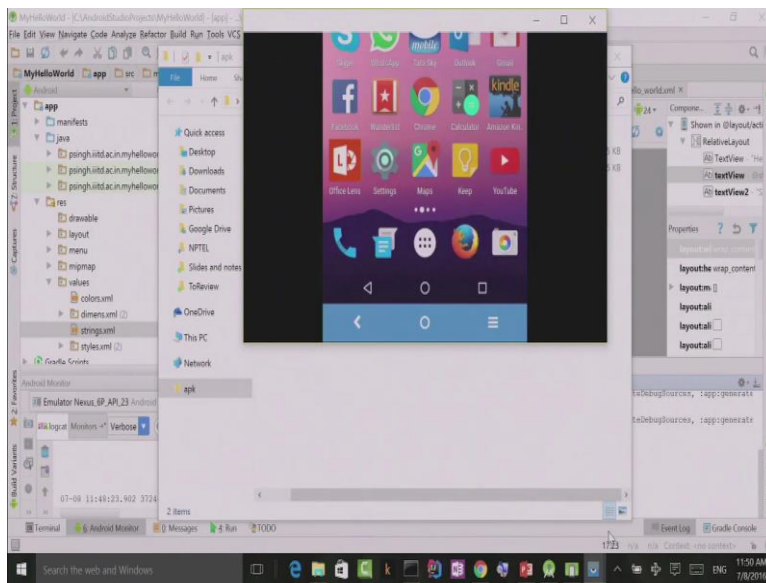
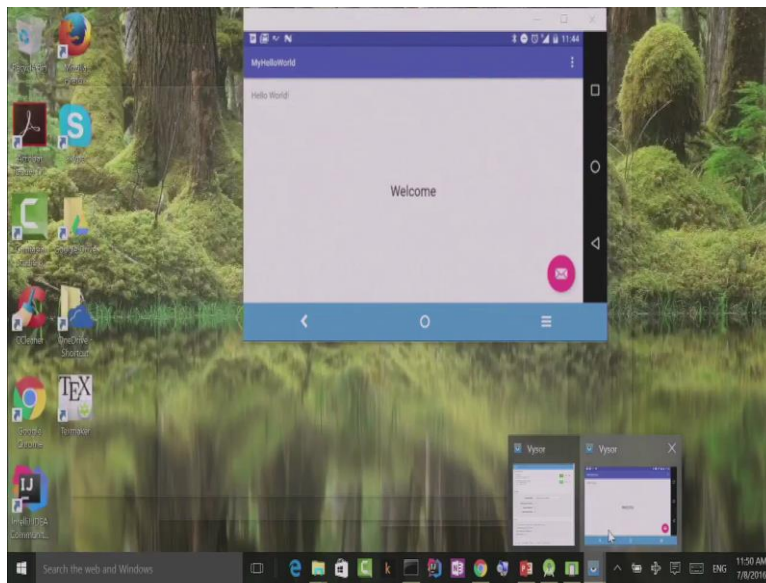
Now let's see where these files are. One thing which I want to do is you may have seen that whenever you want to install an android application you actually installed a file called .apk our android studio allows us to build an (ap) apk file. Let's build a very simple apk file as again you can see that it is trying to build an apk.

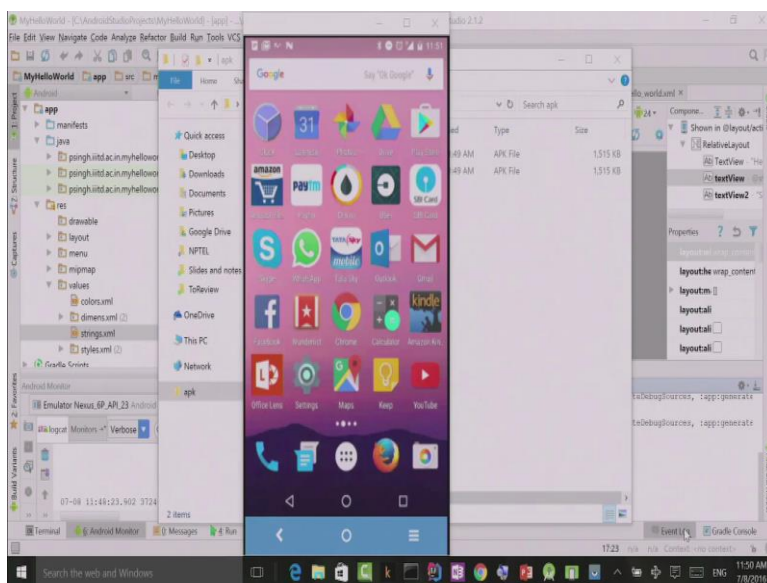
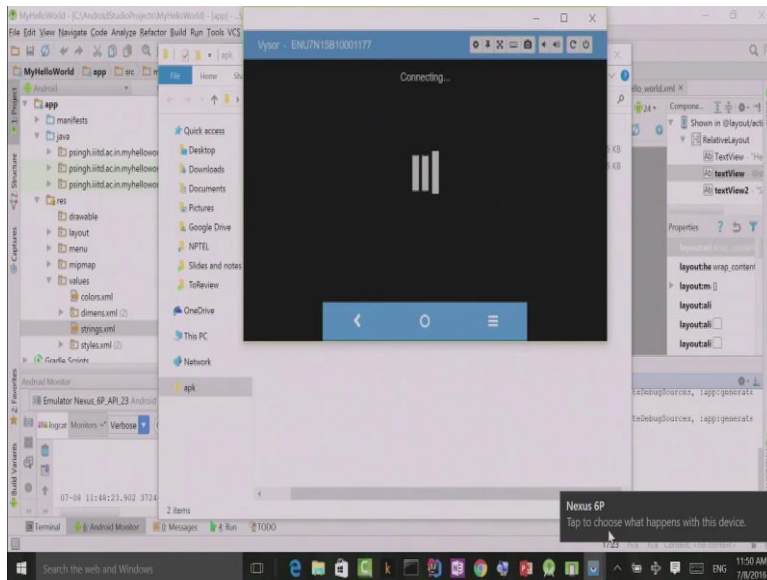
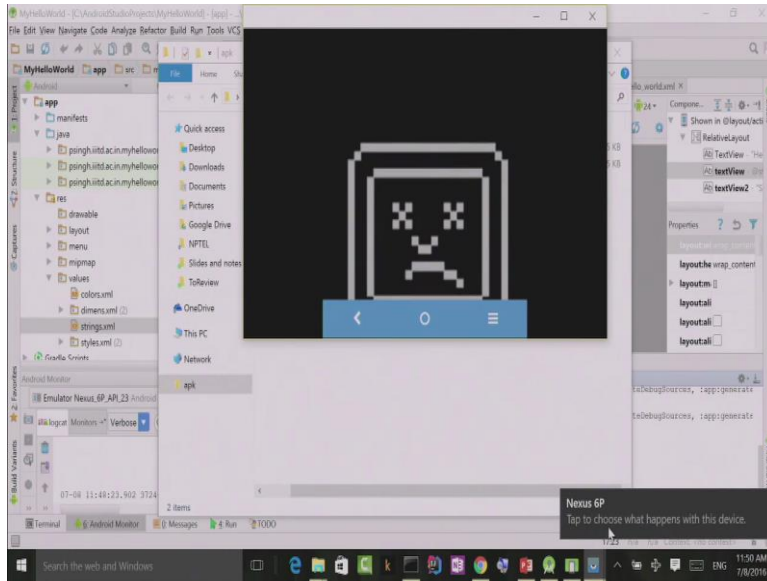
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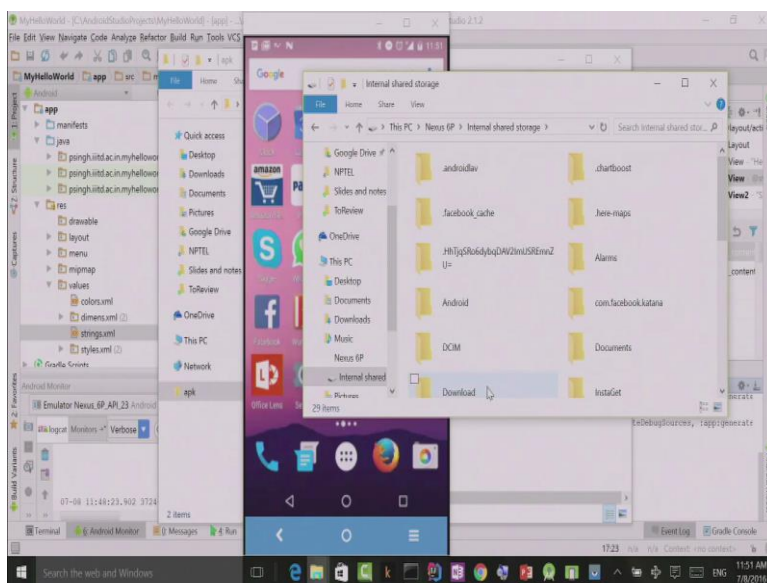
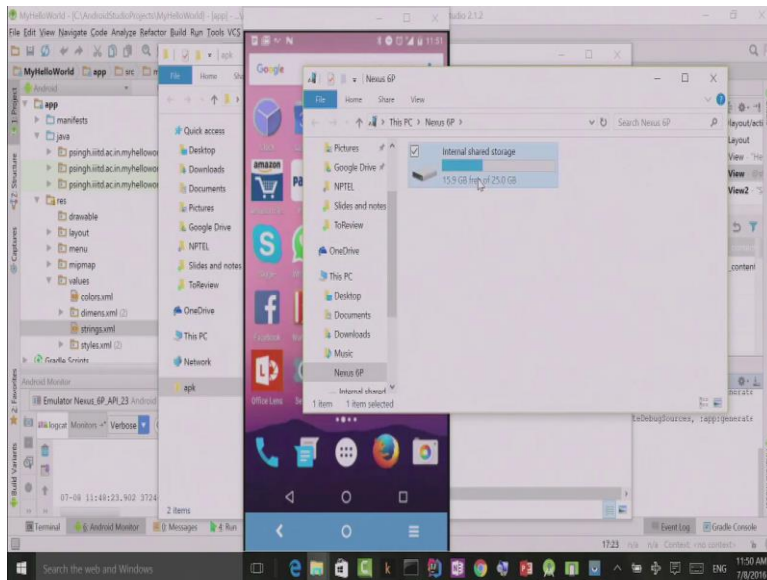
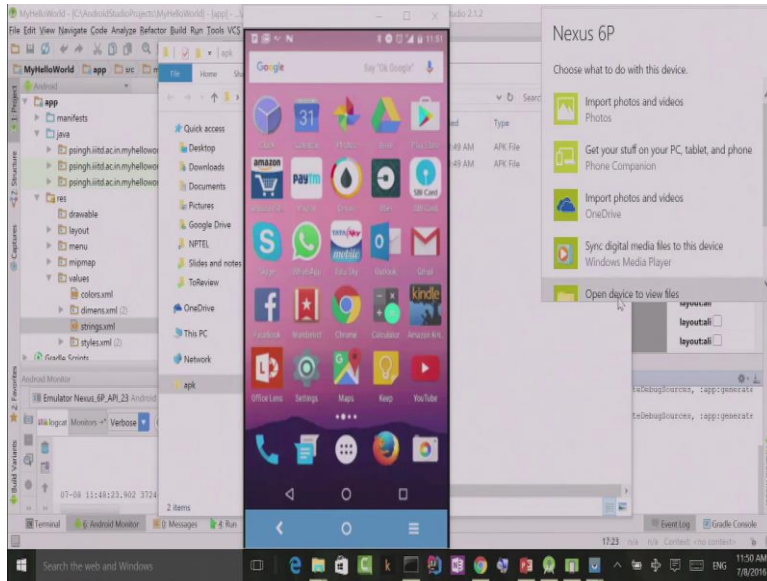


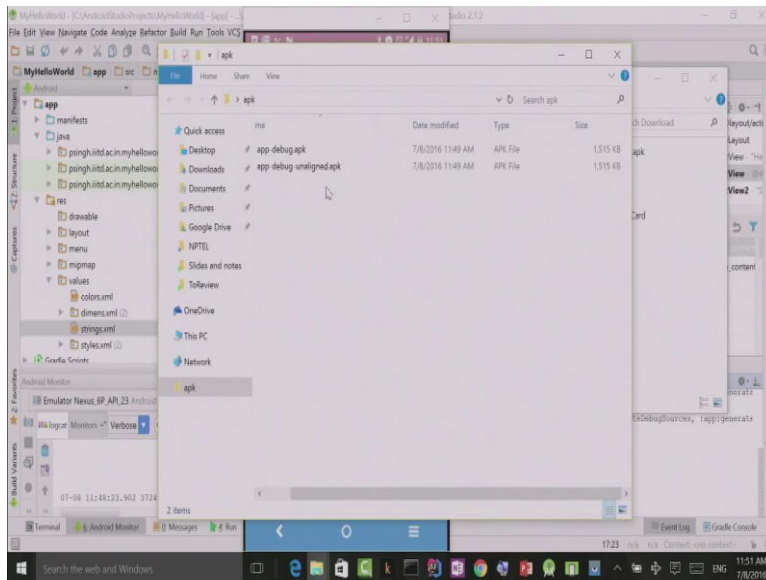
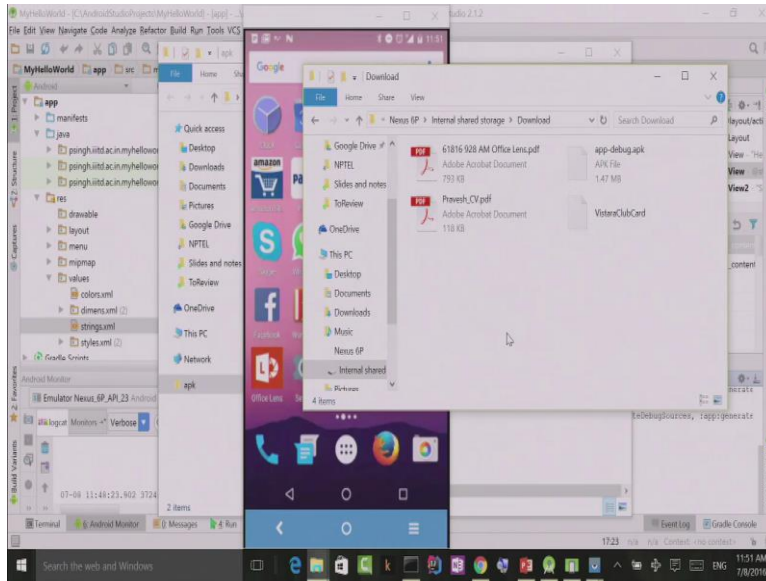
The apk has been generated successfully and here I can see my apk files. Please note the debug suffix if you want to develop a product ready apk files you may want to first stop a debugging and then develop your apk. However even this apk file is good enough to install on your android device. I will now try to transfer this apk file to my android phone. And install it as an application on android phone and run it.

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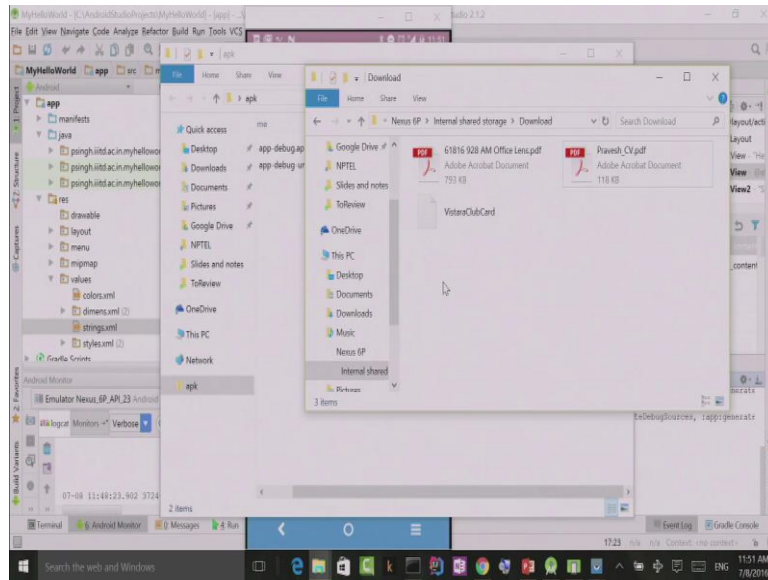
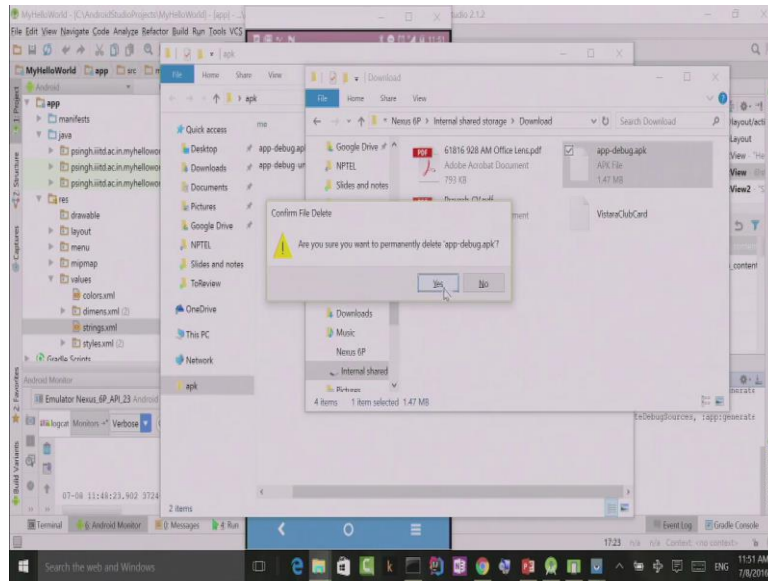




Let me show you my android screen one more time. This is my android screen. I want to transfer files and my phone is set up for transferring files.

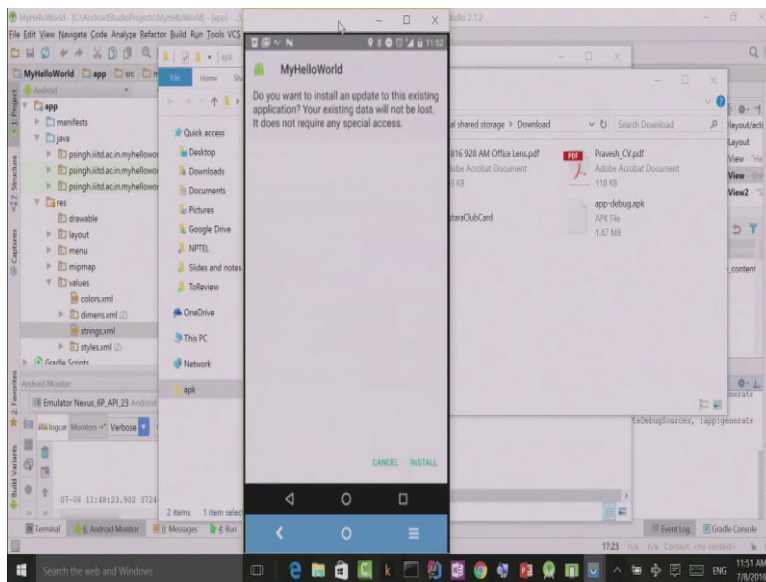
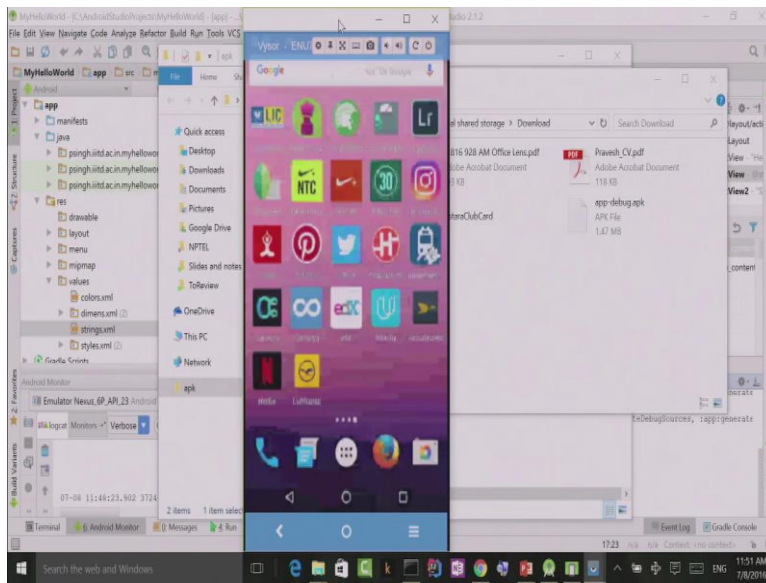


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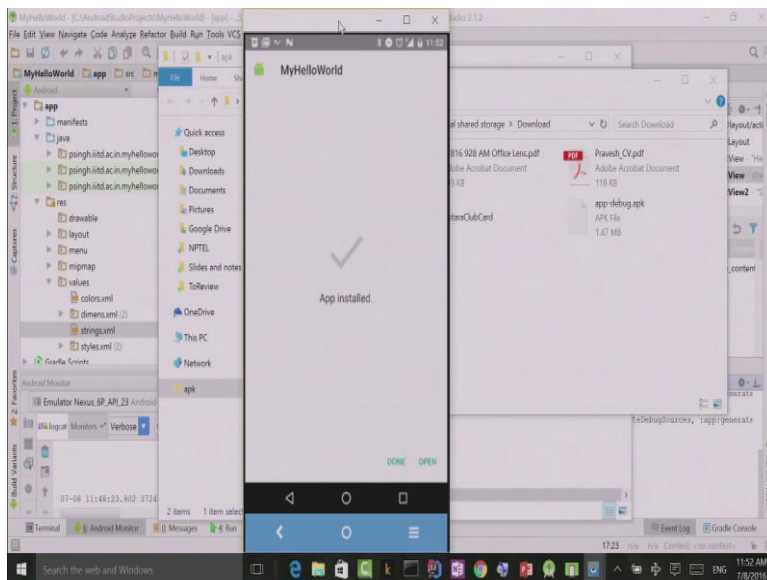
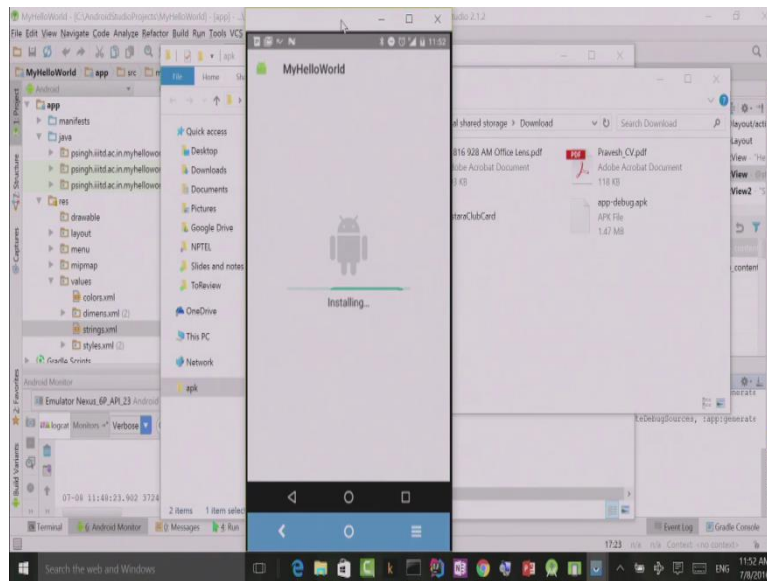
I go to the download folder of (my) of my phone. There is already a file which I created yesterday or delete it. And I may. Now let's install our new apk file. I copy it to my phone as you can see.

(Refer Slide Time: 15:00 )



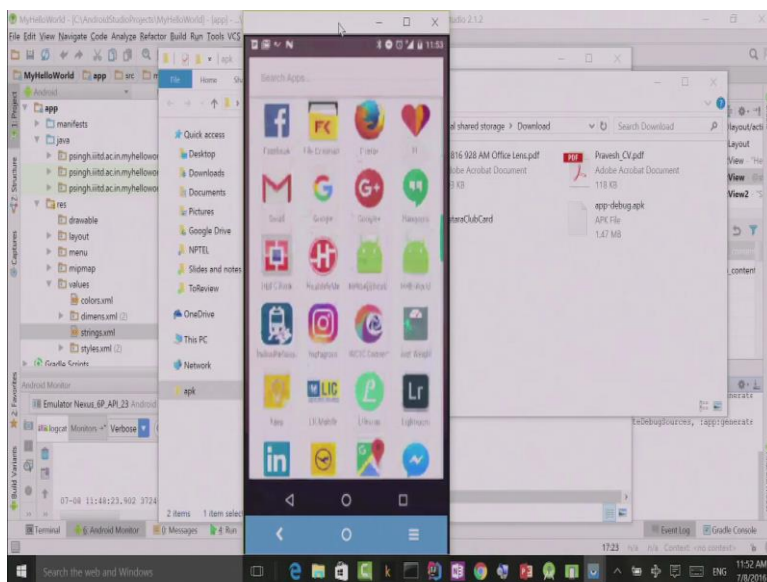
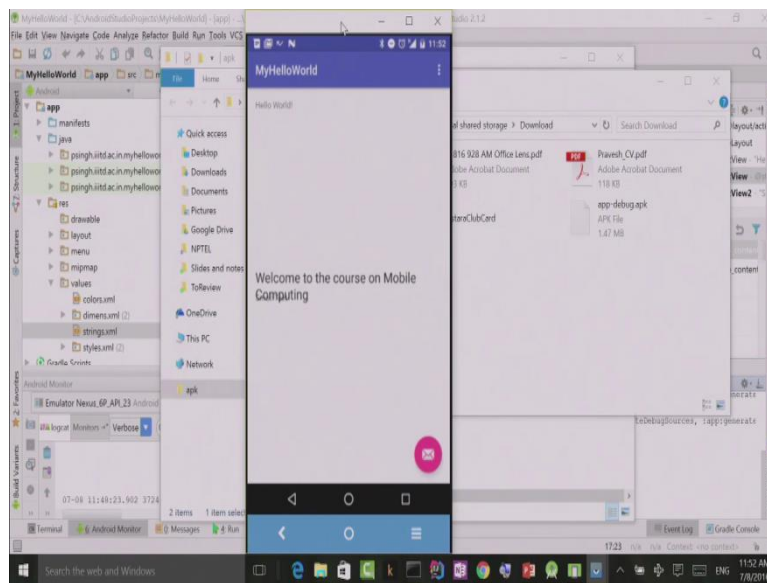
Let's go back to the phone screen. Here you can see the new files that we have just copied. Press it just like any other application that you may have installed on android yourself. Your own application now may ask you to want to install and update to the (())(15:25) application.

(Refer Slide Time: 15:26)



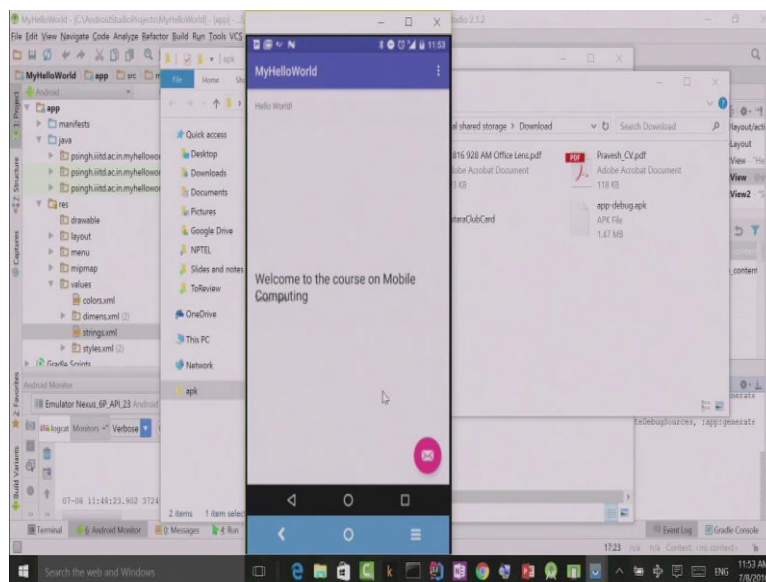
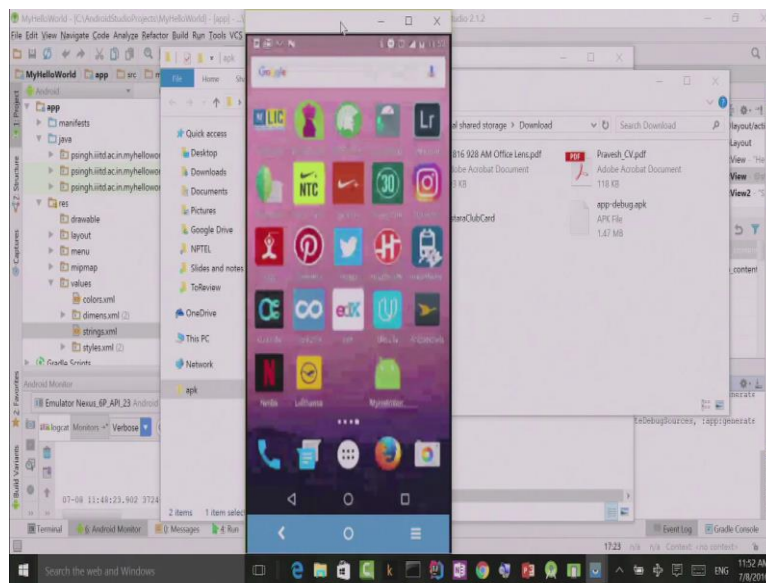
You are saying yes. It is installing and your app is installed on your mobile phone.

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You can open it. It is displaying the message welcome to the course on mobile computing. If you go you can see your app here it is. Hello

(Refer Slide Time: 16:04)



I am bringing it to the top. Yeah so yes. As you can see my app is now installed on my phone I can run it. Here it goes. So in this lecture you have seen that how to deploy your application on an actual android phone. Previously we show (ho) how you can deploy it on emulator that is all the basic that you need. You may have also observed that it is not very difficult to develop application for android studio.

In fact an android or any other platform like your computer on which you have been programming for some time. Android studio makes the task of developing application very easy as you may have seen it already. For these applications we did not go into the detail. How android works? For future applications we will go into the detail, explaining the concepts and making sure that you understand how everything is working. Thank you!