Foundations to Computer Systems Design
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Module 7.3
Working of the Virtual Machine

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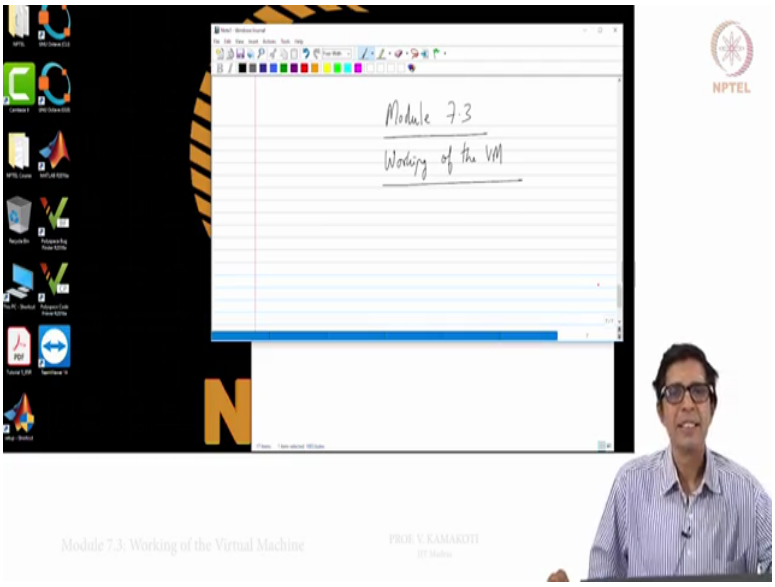

So welcome to module 7.3, in this module we will basically describe you the working of the Virtual Machine. So we will describe it through different examples.

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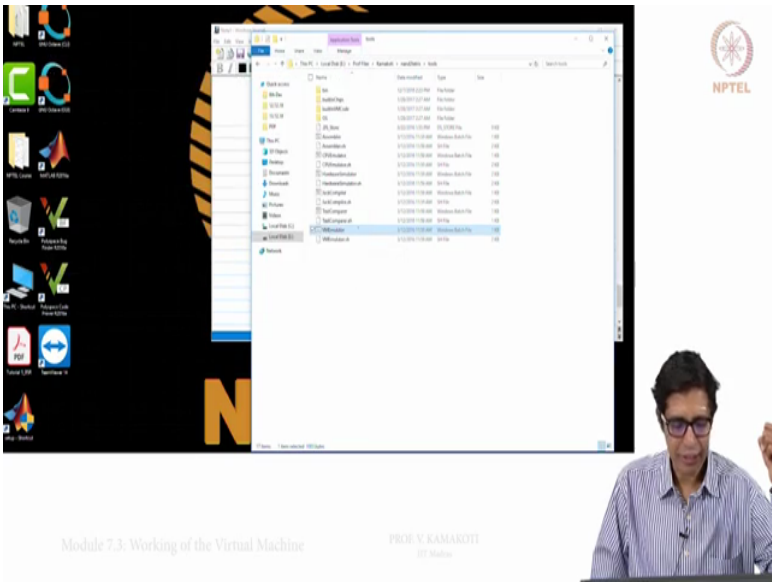

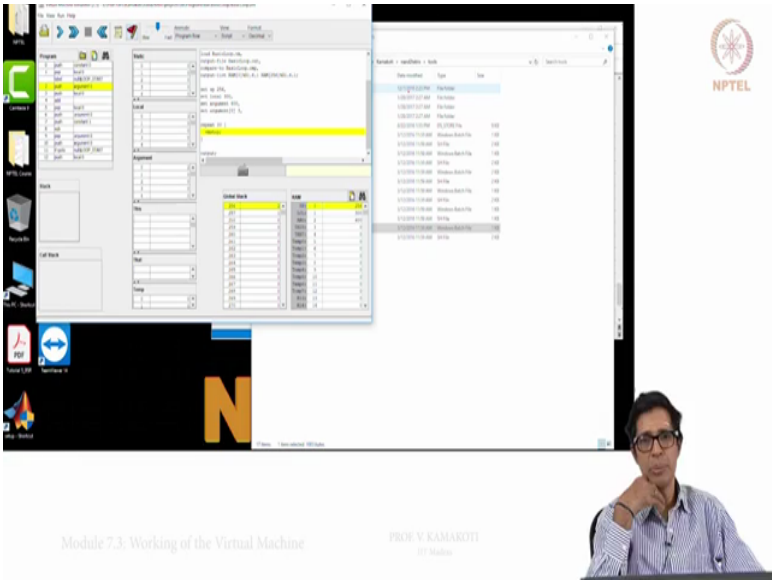

To facilitate this there is a VM emulator tool that is available as a part of your tools, so just click on that and you will get the VM emulator here, right. Now here we can load any of the scripts so we can just say let us say we will go to say project 8 let us talk about say program flow basic loop, there is a basic loop VM me dot test load that script, right and then we can you can now see how it is going to work.

So now you say push constant 0, essentially a stack pointer is set to 256, now you will see that your stack pointer becomes 257, right pop local 0, right. So the local variable is set to 16, so the local variable always starts with 16, so pop local 0, so when you see this that is popped out and if you go and see the 16th location is 0, right then push argument 0 so argument currently is in 400, 400 in location 400 we really do not know what is this is a stack in location 400 we can just look at this in location 400 we will have 3, so this is there in location 400 we have been setting it as 3, okay.

So push argument 0 3 will be now pushed onto the stack, right push the content of argument plus 0 argument is 400 plus 0 in 400 I have 3, so essentially 3 gets loaded onto this and push local 0, local is what? 300, so what is there in 300? As you see 0 is there so if you just push local 0 basically you get 0 but your stack pointer has increased to 258. Now we are adding this 0 plus 3 will give you 3 and the stack pointer will become 257.

Now pop local 0, so this 3 basically now gets popped into local plus 0 that is 300 plus 0 so that right push argument 0 again you are pushing 3, push constant 1 subtract so this becomes 2, pop it to argument 0 push again argument 0 again you get 2. If the top of the stack is non-zero go to null loop and start. So we go back there and this is how it goes. So for all the

instructions one by one we can just run all these codes so have this (())(4:08) for every directory and we can run that to understand how these different codes are executing. So this is one facility for you to appreciate the working of the virtual machine emulator and the essentially understand how the virtual machine works.

So you can basically use this VM emulator to do this and understand the different instructions, you will now meet now in module 7.4.