CLOUD COMPUTING

LAB 1, 2 & 3

Computer Engineering
Badal Parmar
18BCP011
Div. 2

AIM:

- To Install and configure VMware Workstation Pro for creating the Virtual Machine.
- Exploring VMWare Workstation Pro to create the virtual Machines

1. **Create Three or more Virtual Machine and assign resources.**
2. **Install two or more Guest Operating Systems on all the VMs.**
3. **Run simple applications or programs on all the VMs.**

INSTALLATION OF VMWare:

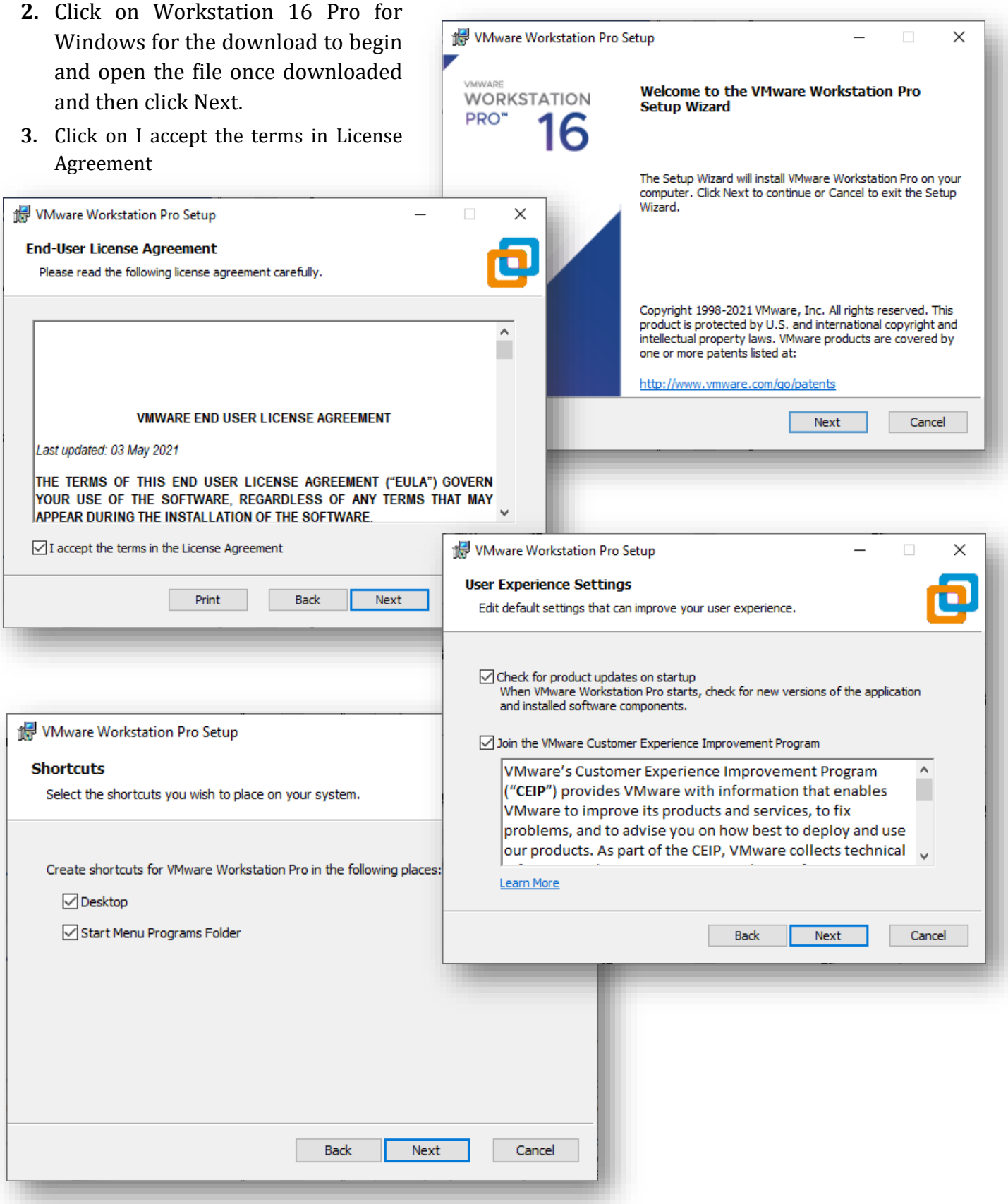
VMware Workstation Pro is the industry-standard desktop hypervisor for running virtual machines on Linux or Windows PCs.

INSTALLATION STEPS:

1. Download VMware Workstation Pro from the website

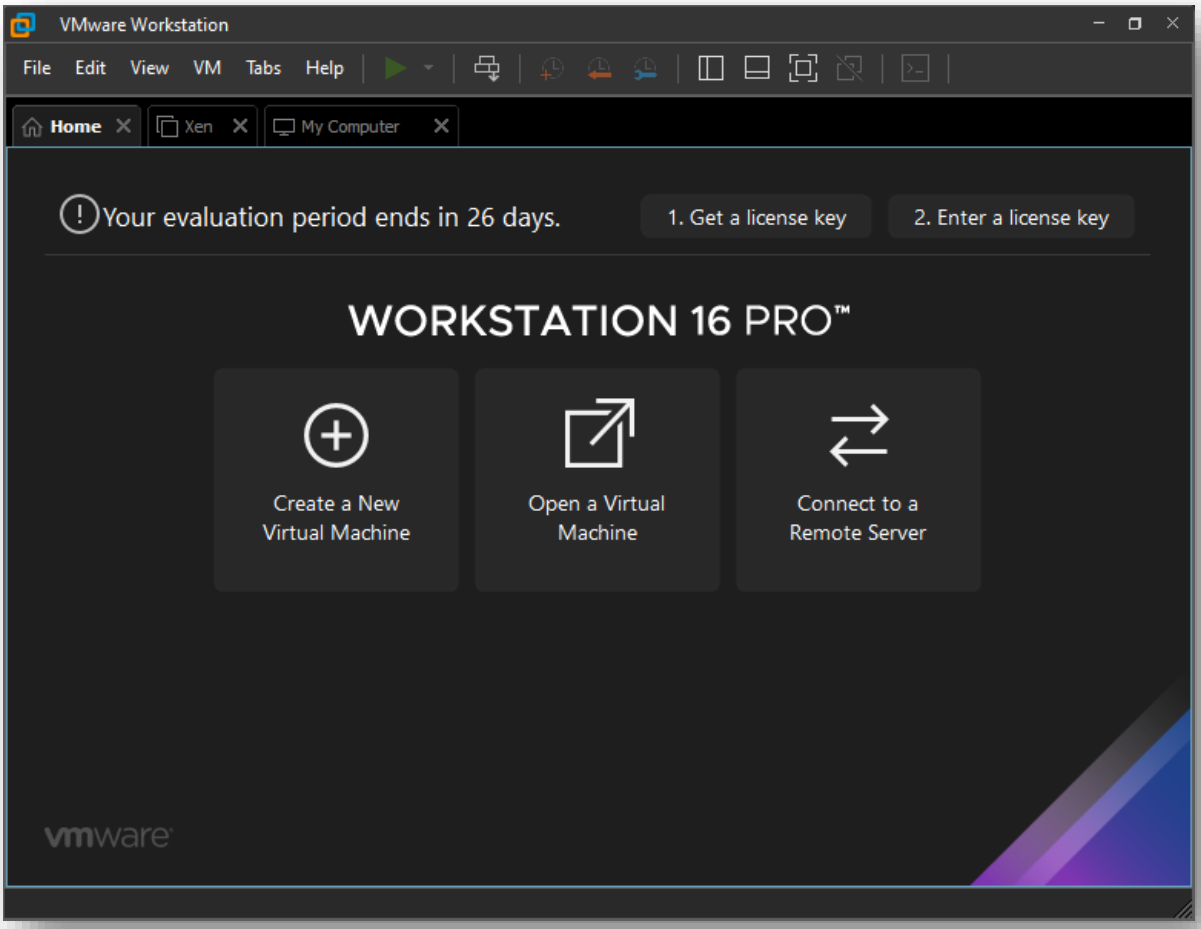
→ Website Link: https://www.vmware.com/in/products/workstationpro/workstation-proevaluation.html

2. Click on Workstation 16 Pro for Windows for the download to begin and open the file once downloaded and then click Next.
3. Click on I accept the terms in License Agreement



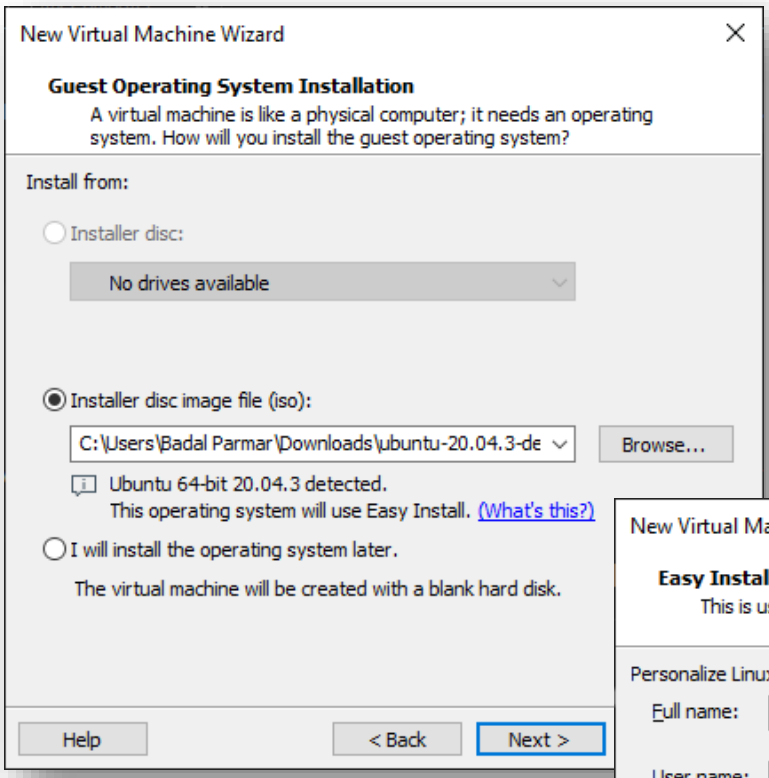
4. Click on Next and Next and finally click the Install button for the Installation to Begin

5. Vmware Workstation interface will pop up and is ready to run, create a Virtual Machine to create your very first project.

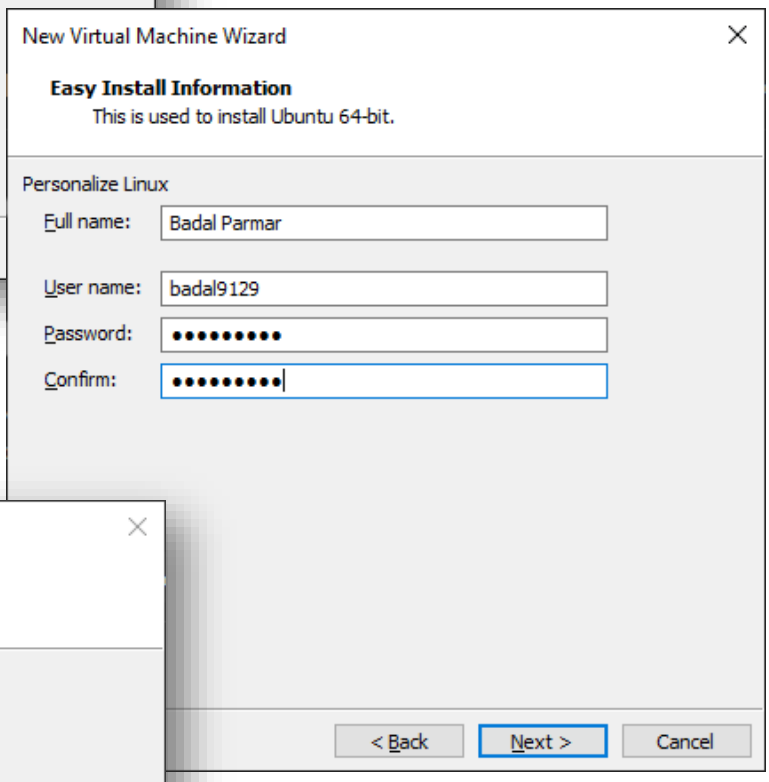


6. Click on Create a New Virtual Machine to create a New Virtual Machine in VMware Workstation Pro and then further click on the **Typical (recommended)** part.

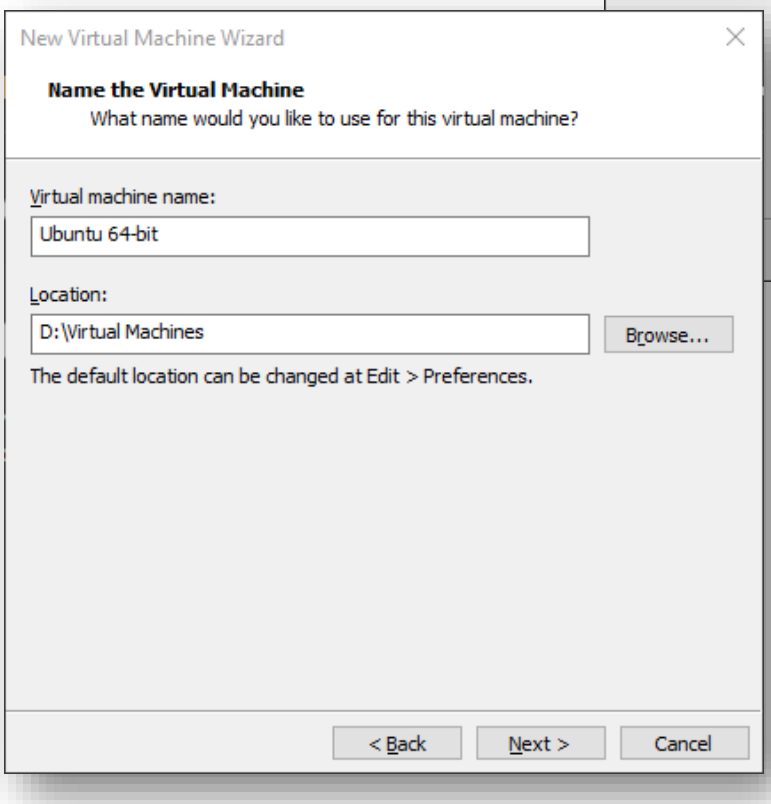
1. Ubuntu as Operating System in VMWare:



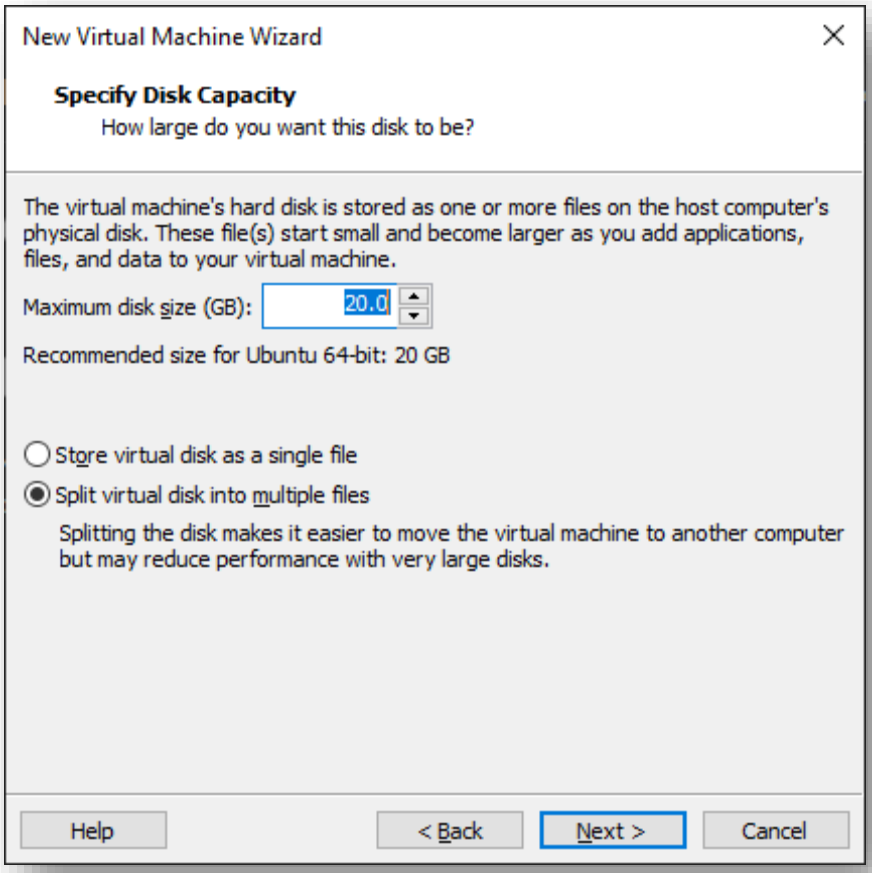
⇨ Click on the Installer Disc file (iso) and then select **Ubuntu ISO Image** from the system/laptop from the Browse Button.



Enter the personal details including Username, Password and Full Name.

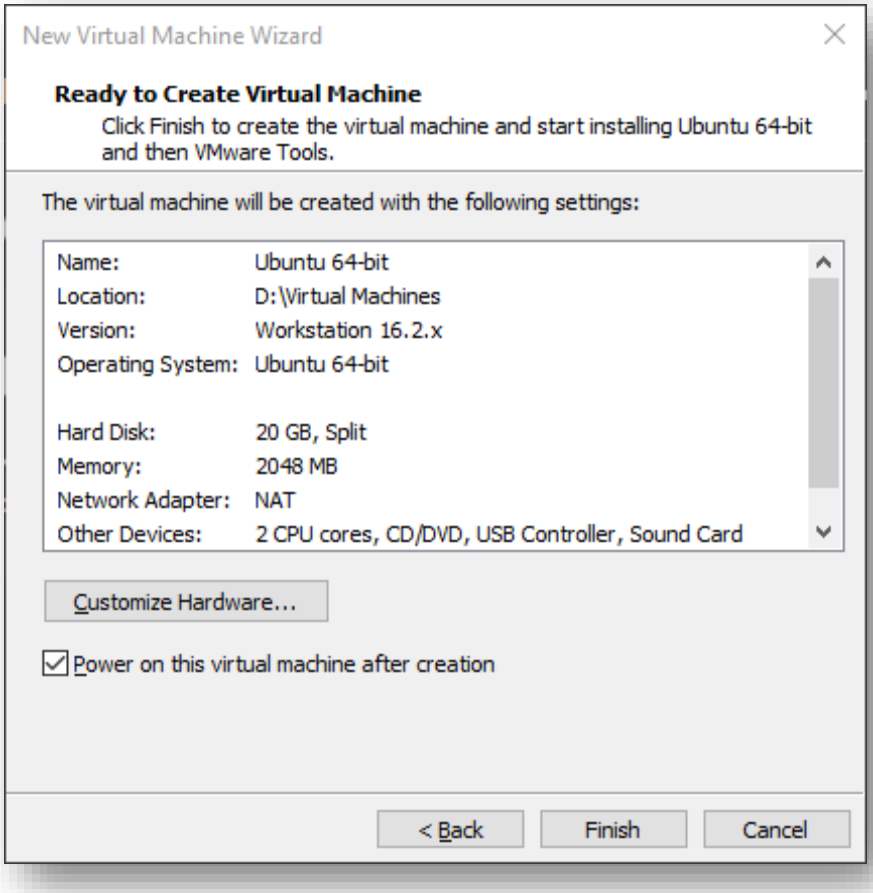


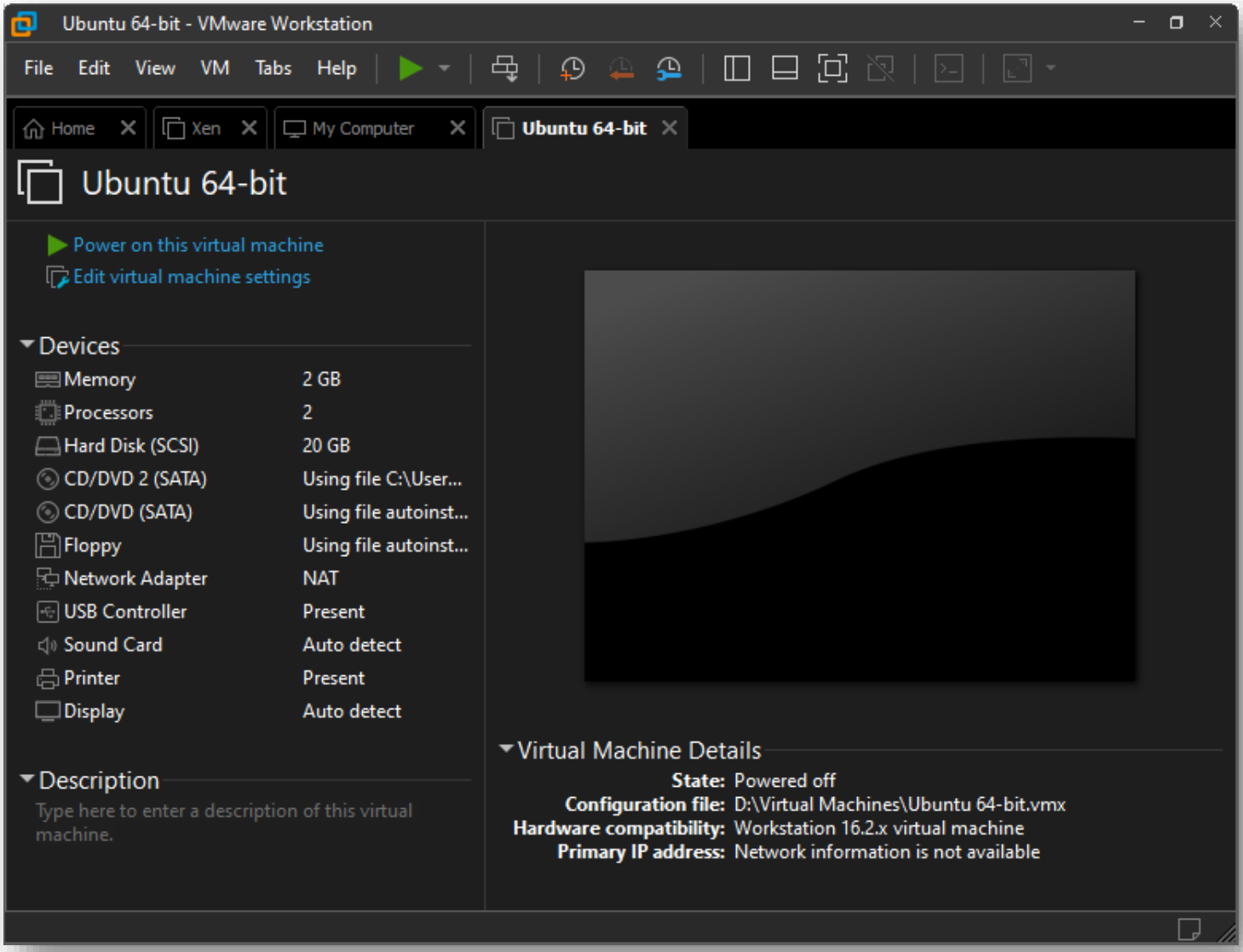
⇨ Name the Virtual Machine as Ubuntu and Click on next button.



⇨ **For Ubuntu Operating System installation, let the default settings remain on the current page and then Click Next**

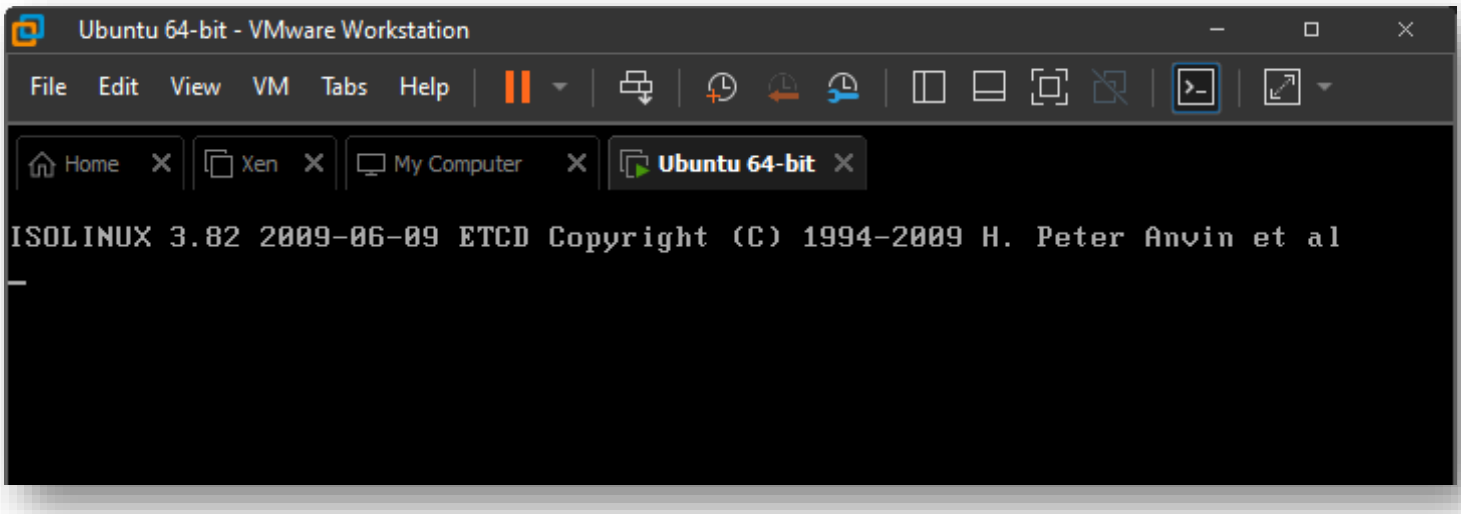
⇨ **Click on Finish button**





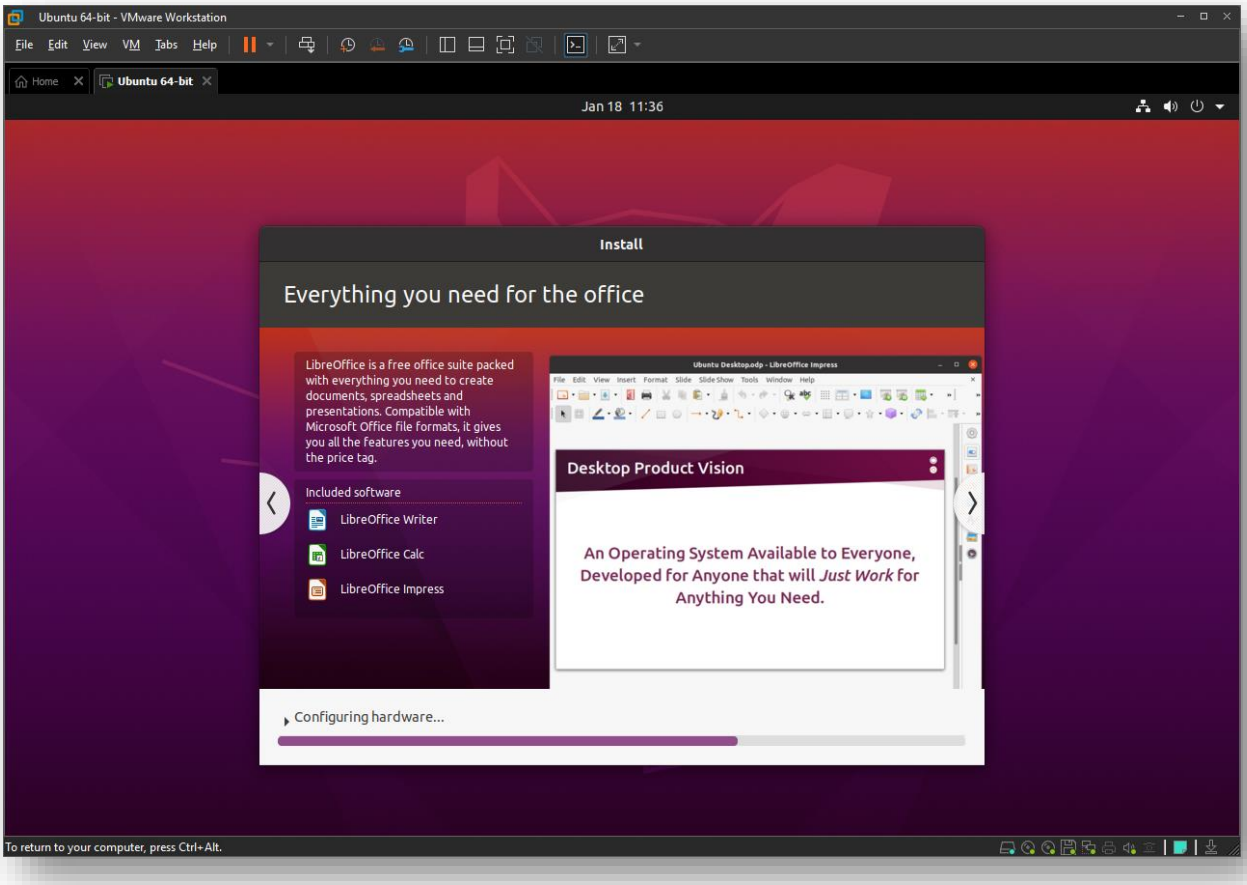
⇨ Virtual Machine for **Ubuntu Operating System** is now created as shown in the above image and then click on **Power on this virtual machine** option to turn on the **Virtual Machine**.

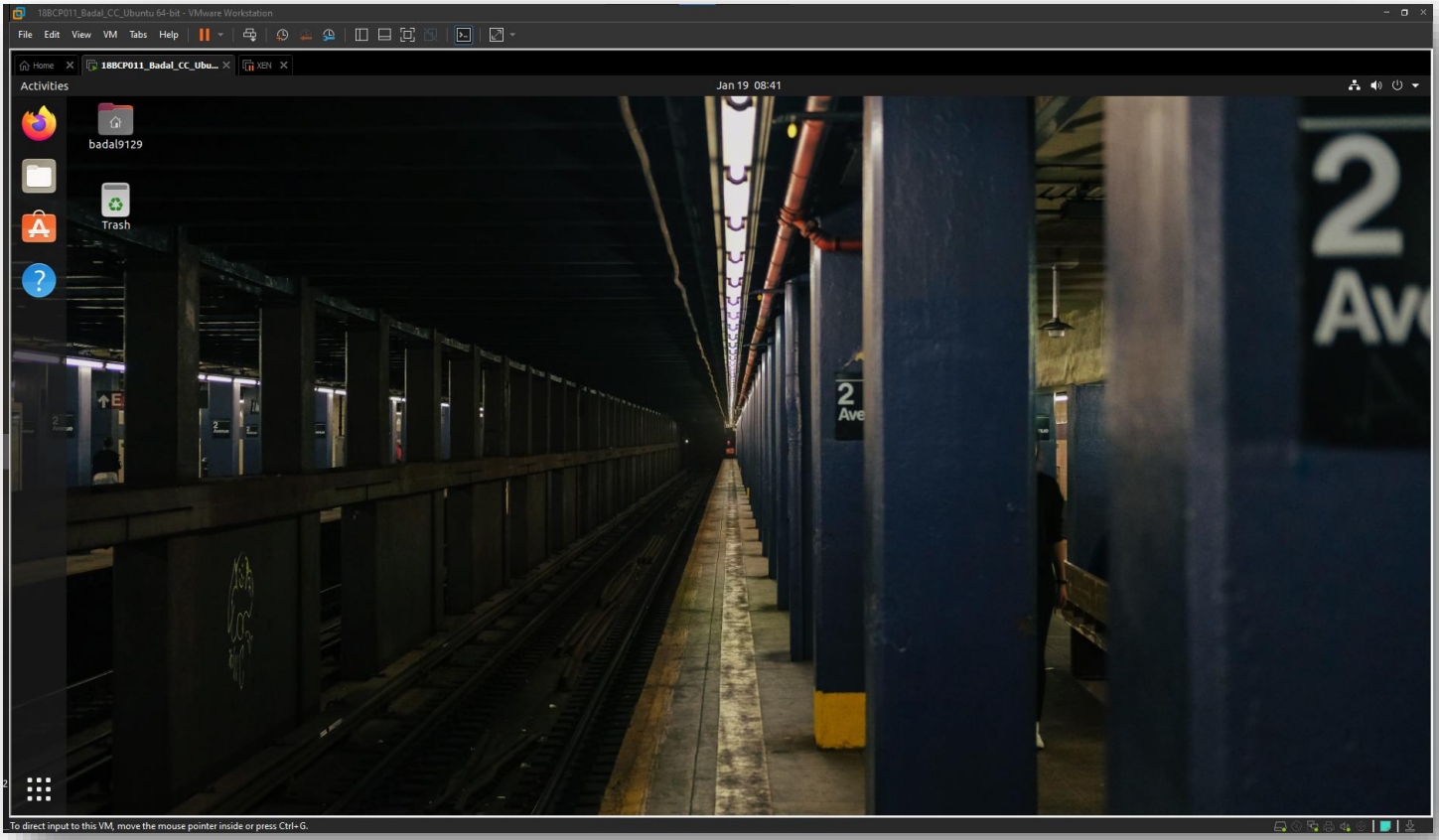
⇨ Ubuntu will start and the screen will be visible as shown in the image below.



⇨ User Interface of Ubuntu 64-bit will be display as shown in the figures below

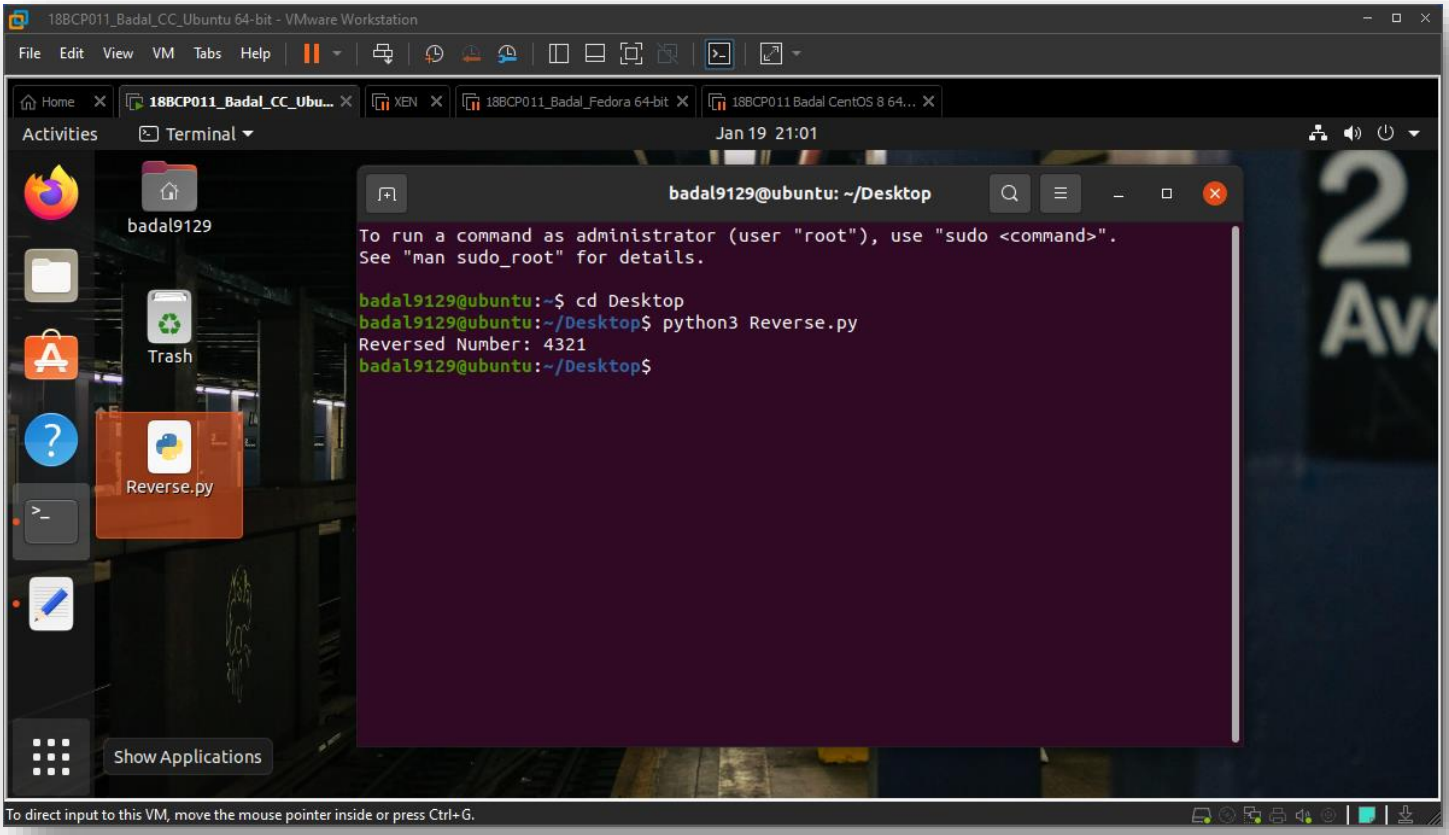
- Figure 1 dispays the configuring of Ubuntu 64 bit.
- Figure 2 displays the UI of **18BCP011_Badal_CC_Ubuntu 64-bit**.

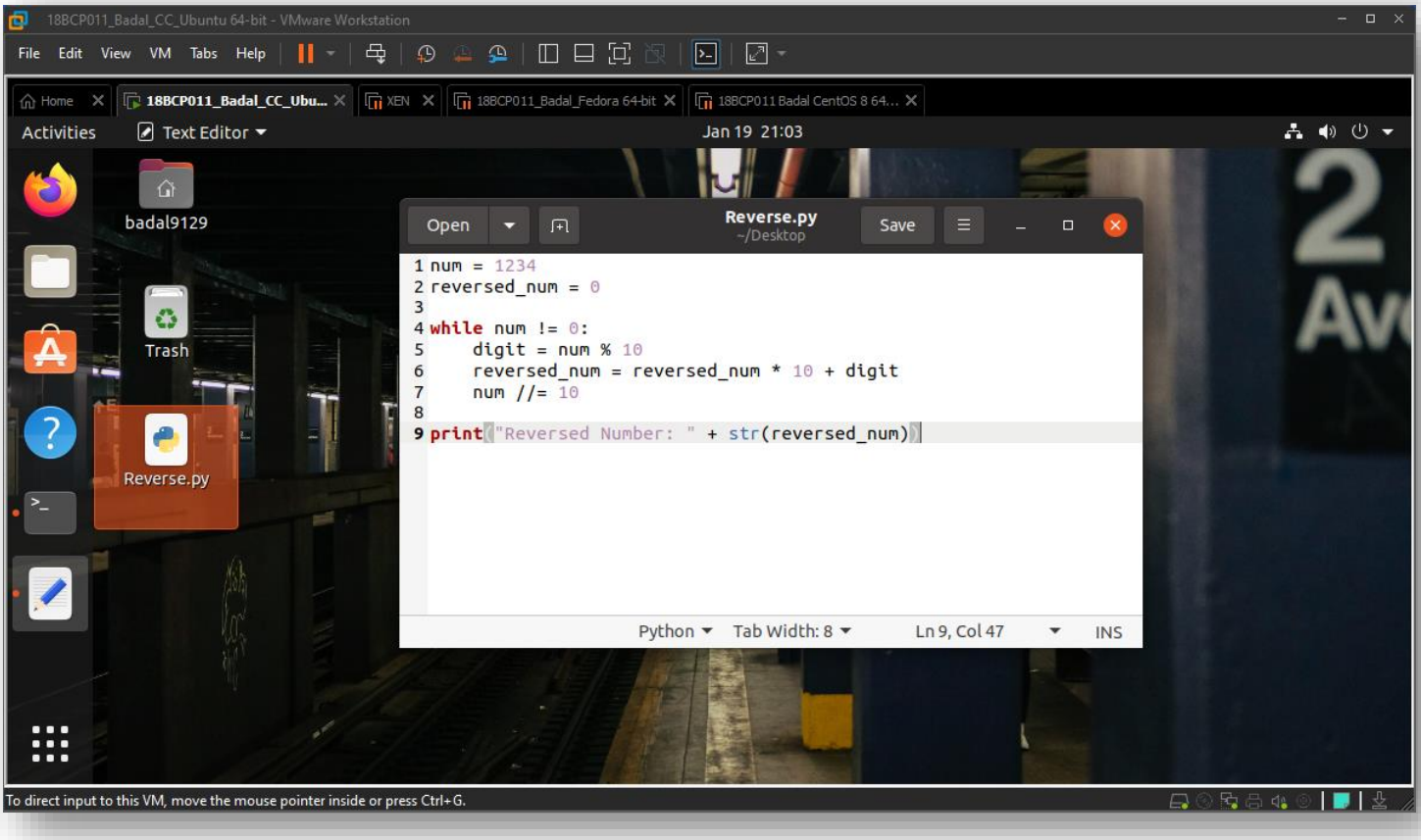


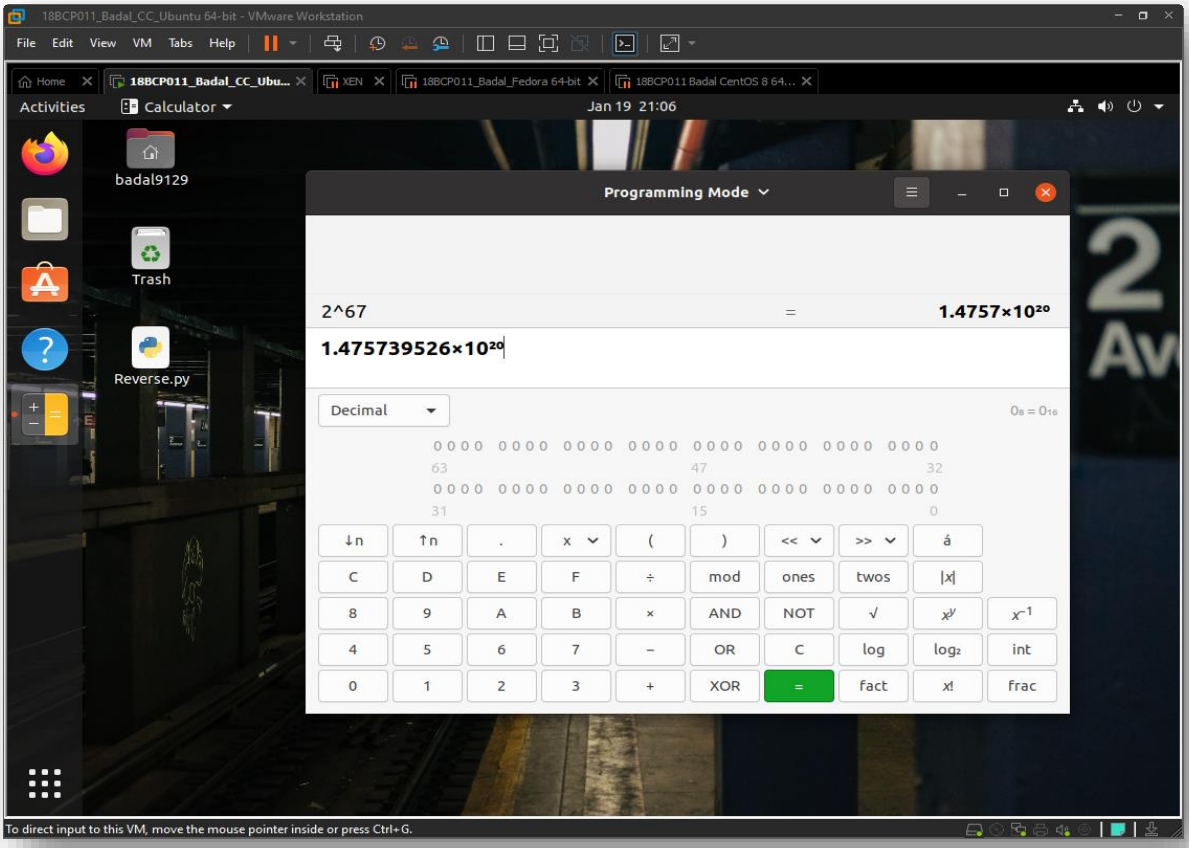


Running Simple Applications/Programs in Ubuntu Virtual Machine.

⇨ **Figure below shows the Text Editor & Terminal running python code for reversing a number.**

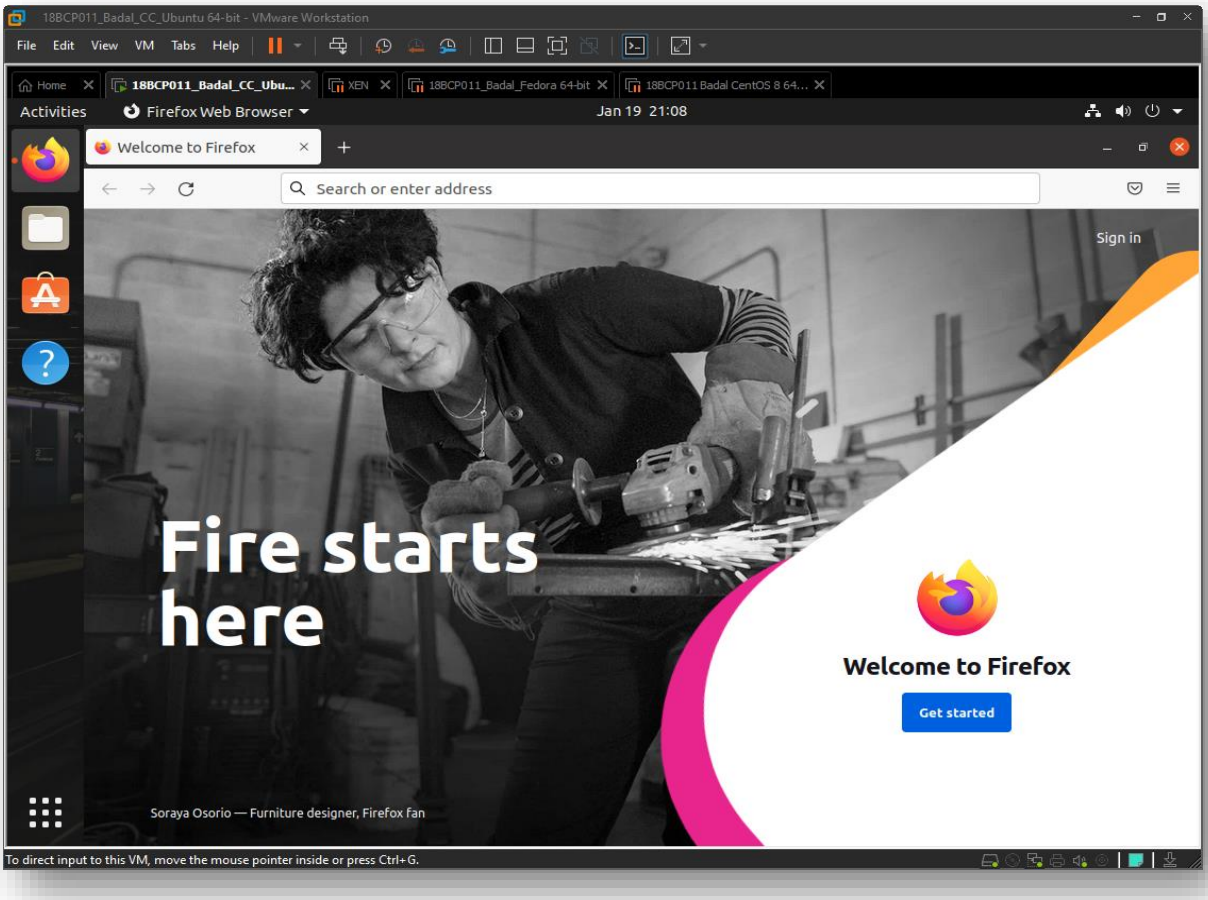




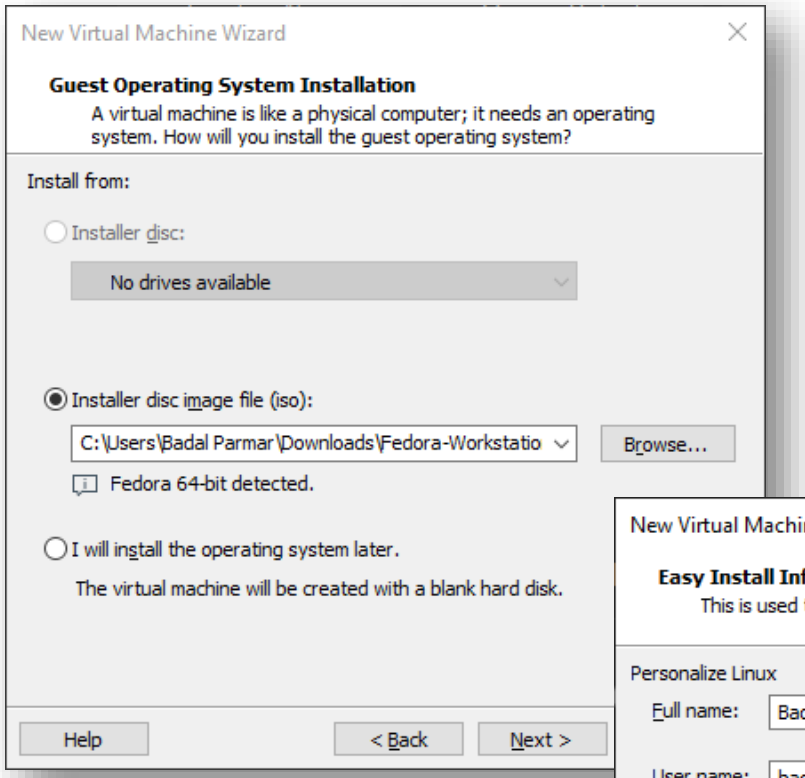


⇨ **Figure 1. Shows the working of Calculator in Programming mode in Ubuntu Virtual Machine.**

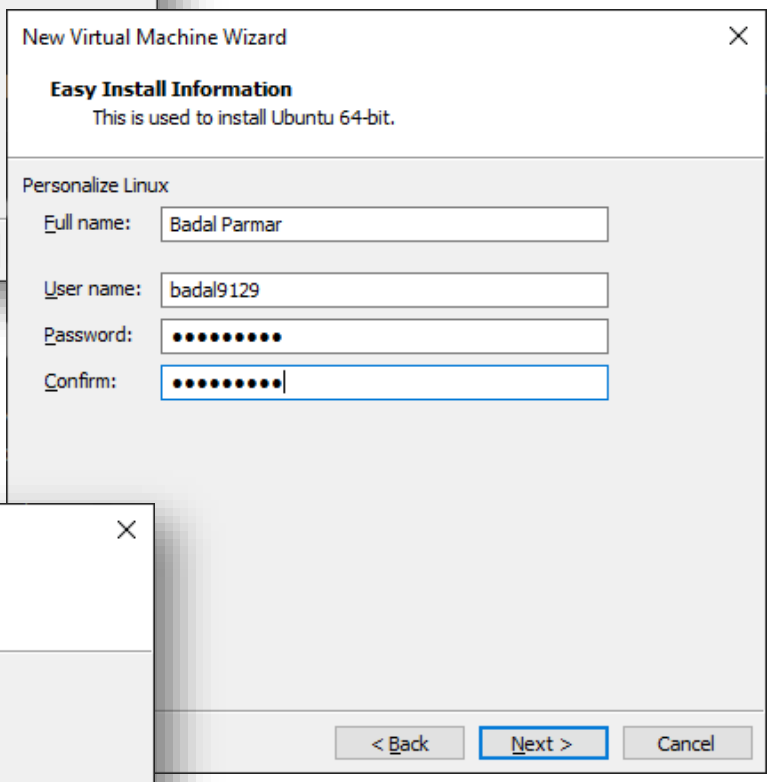
⇨ **Figure 2. Shows the UI of Firefox beginning page in Ubuntu Virtual Machine.**



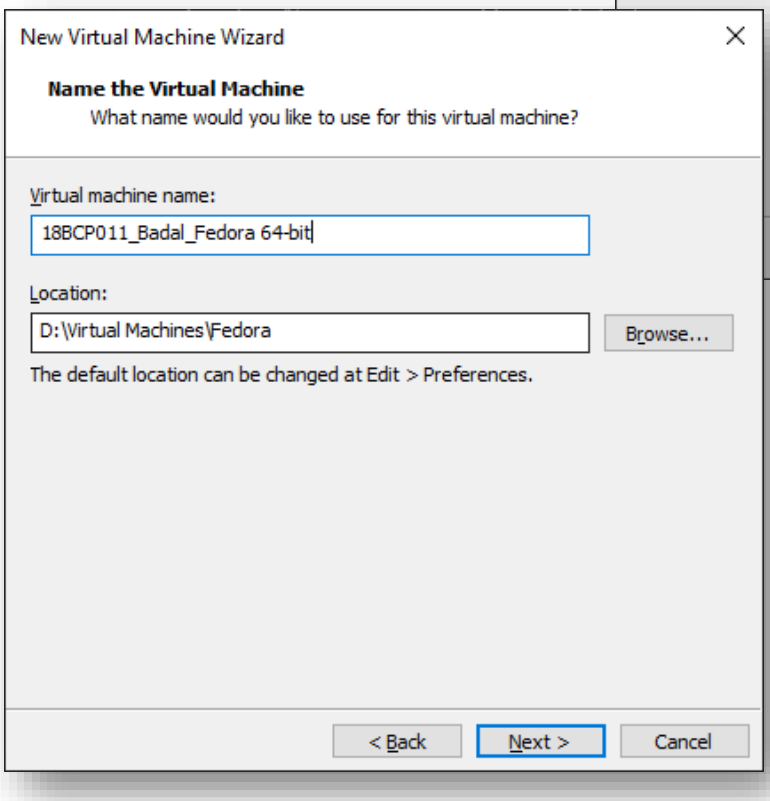
2. Fedora-OS as Operating System in VMWare:



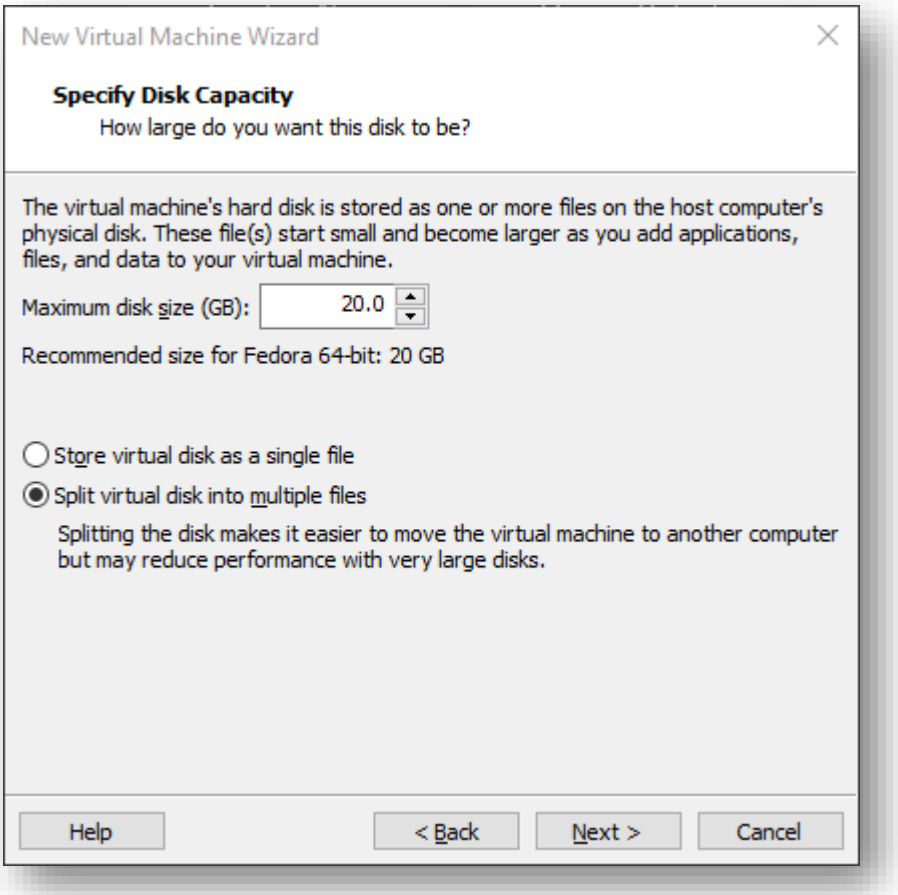
⇨ Click on the Installer Disc file (iso) and then select **Fedora-OS 64-bit ISO Image** from the system/laptop from the Browse Button.



Enter the personal details including Username, Password and Full Name.

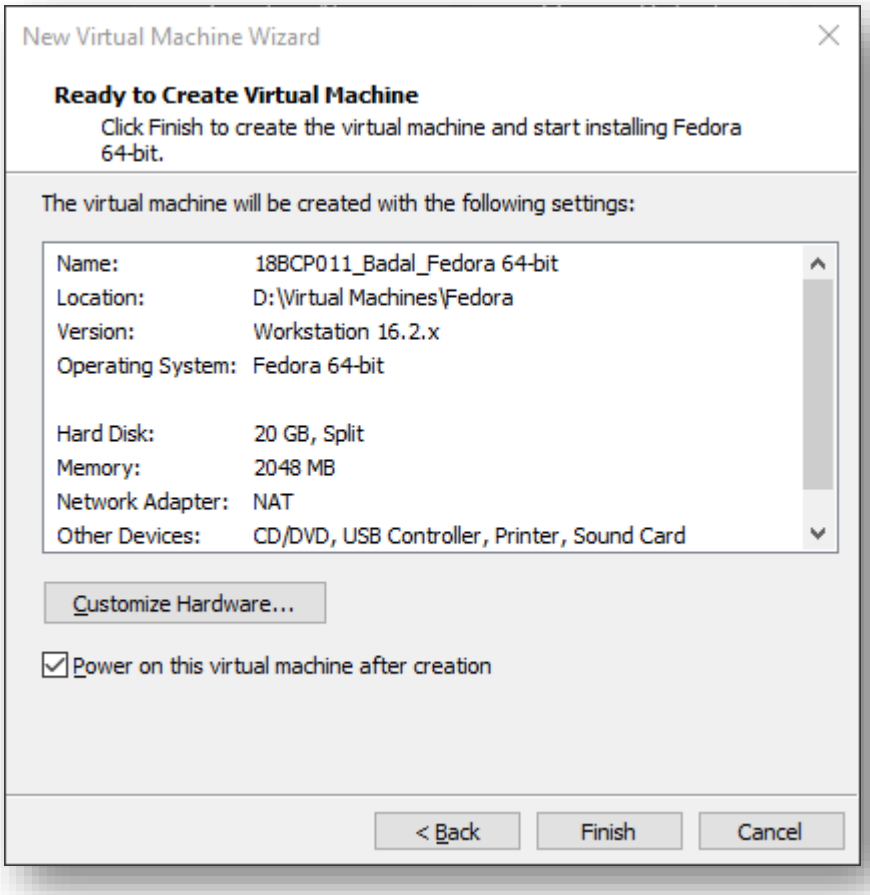


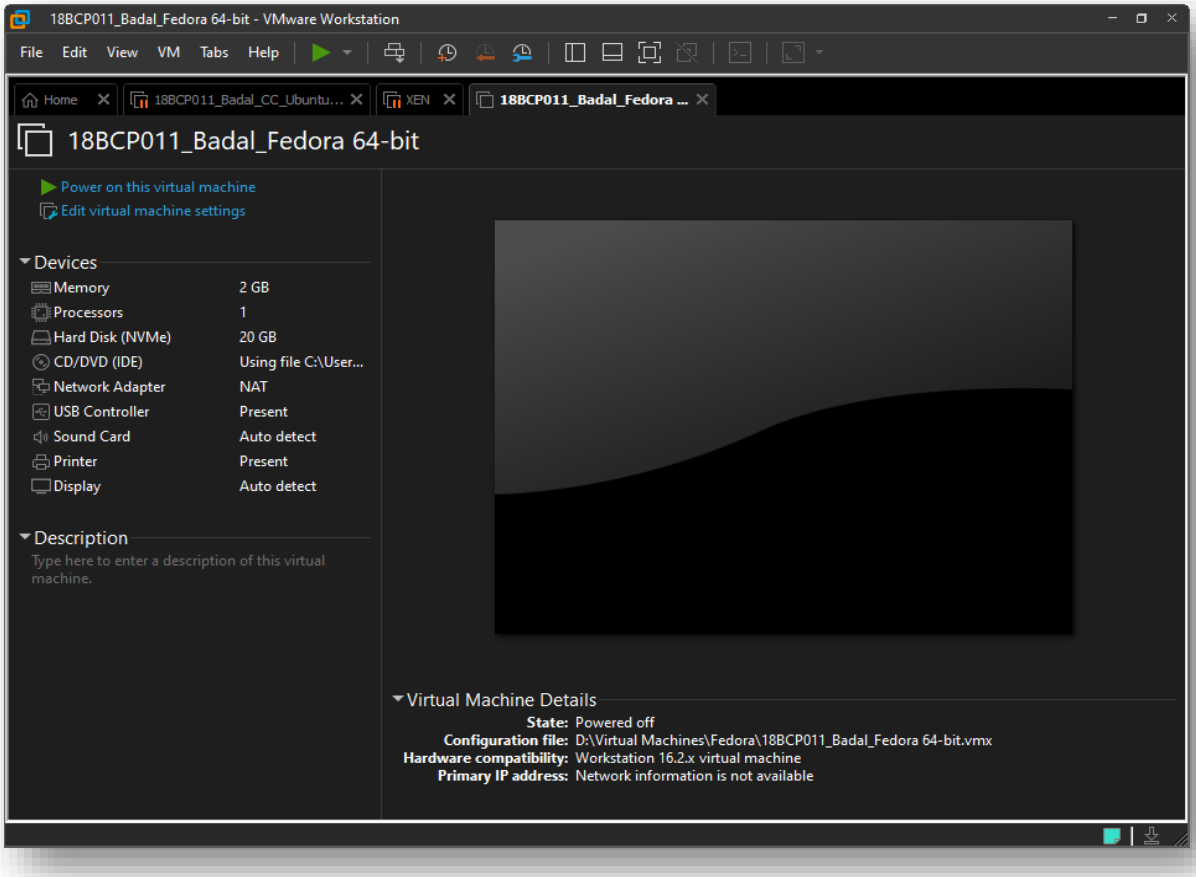
⇨ Name the Virtual Machine as Ubuntu and Click on next button.



⇨ **For Fedora 64-bit Operating System installation, let the default settings remain on the current page and then Click Next**

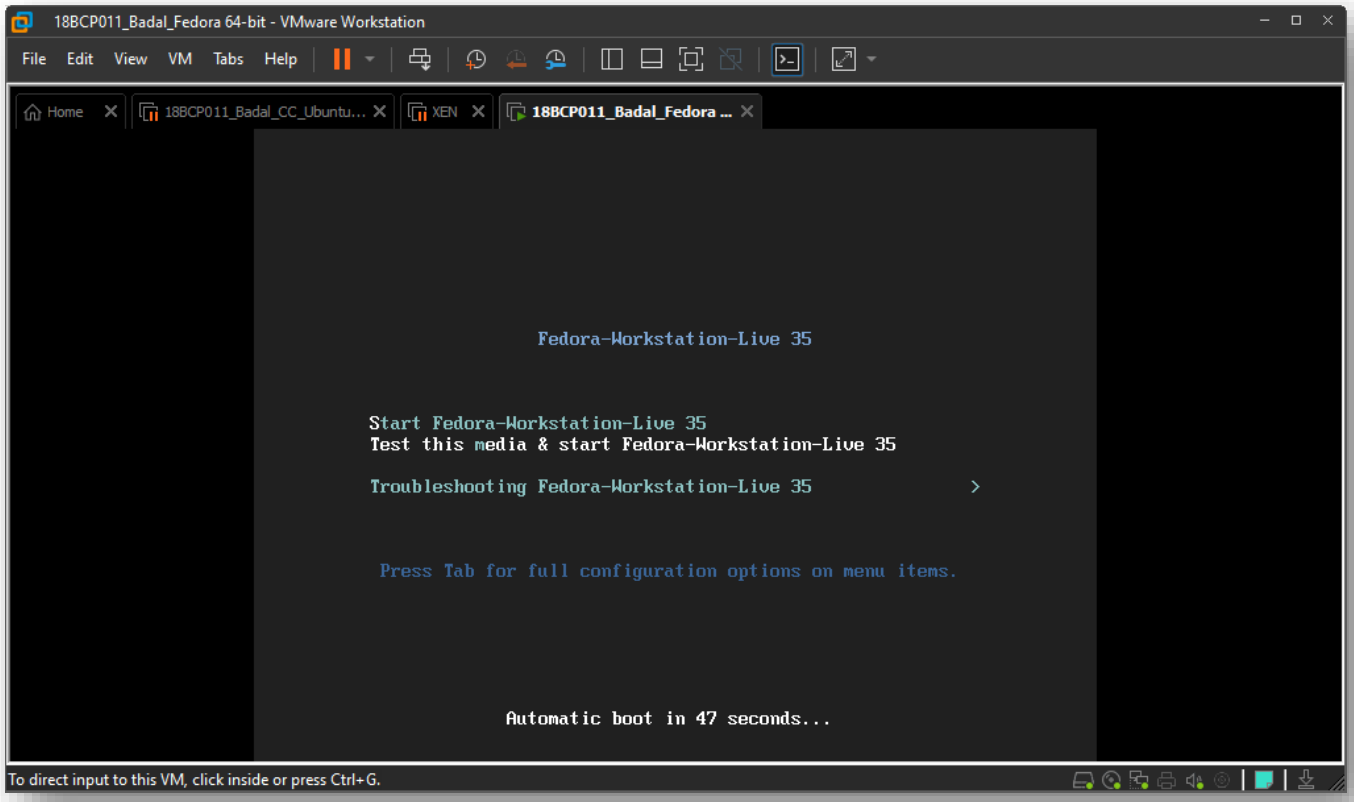
⇨ **Click on Finish button**





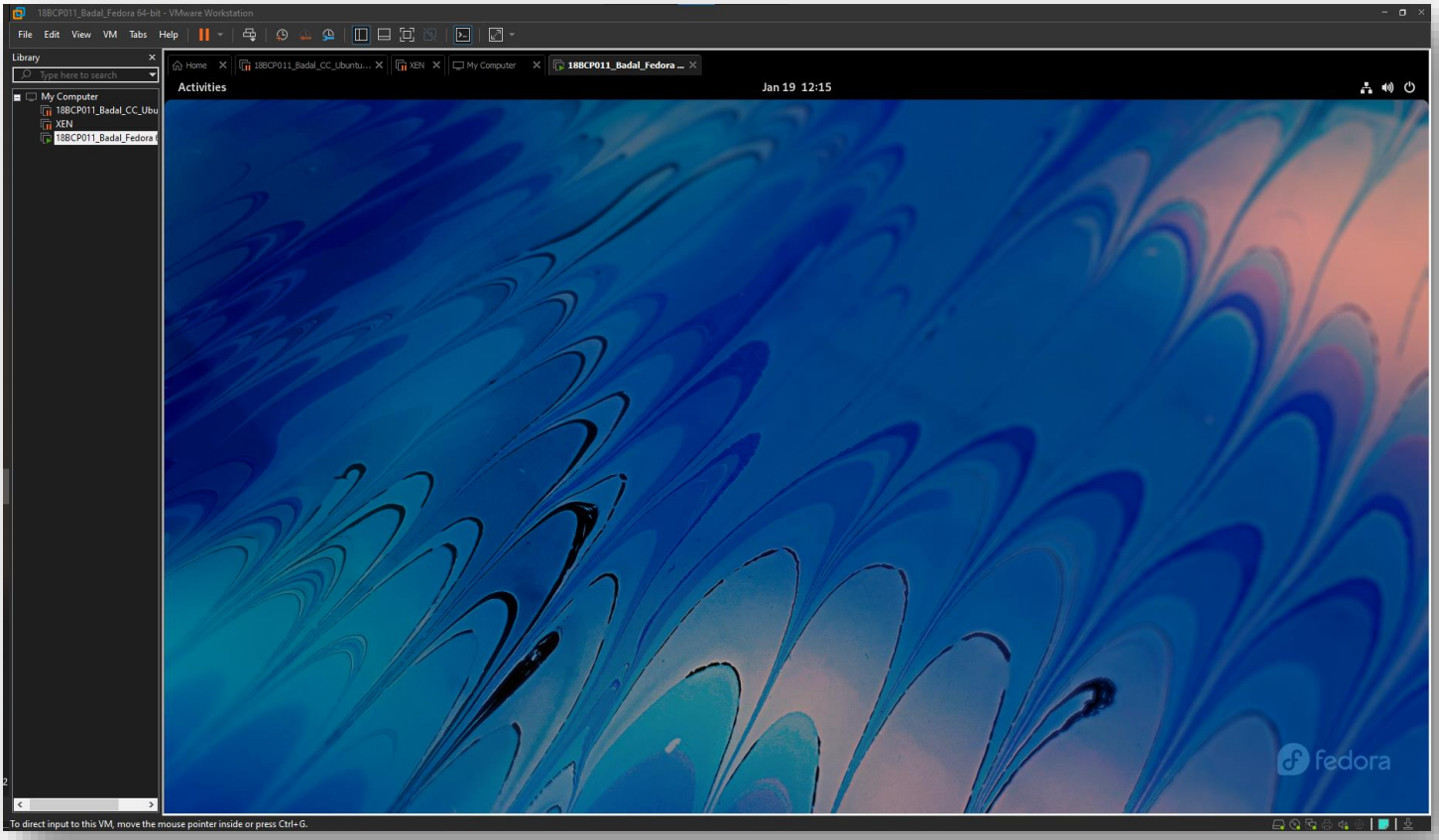
⇨ Virtual Machine for **Fedora Operating System** is now created as shown in the above image and then click on **Power on this virtual machine** option to turn on the **Virtual Machine**.

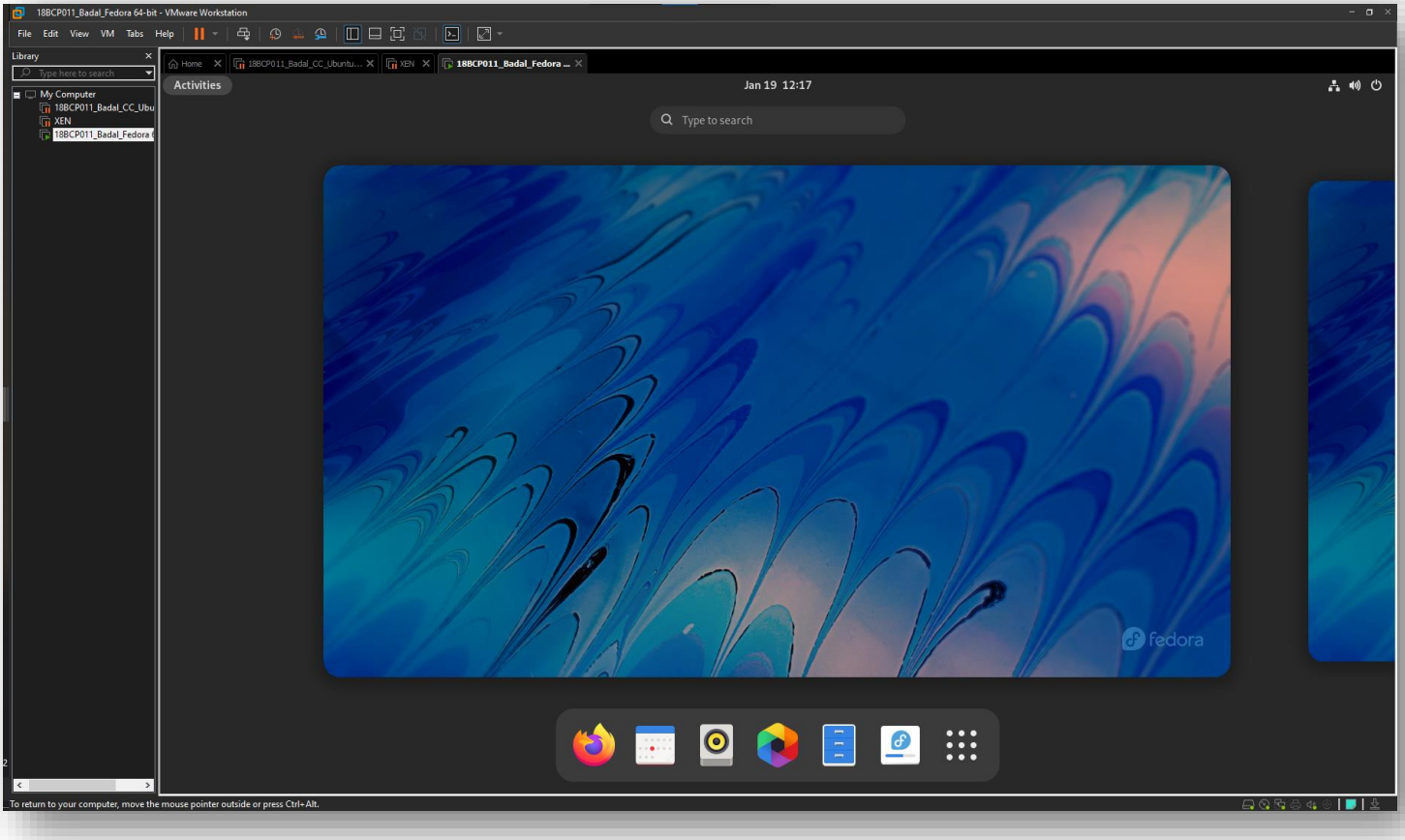
⇨ Fedora will start and the screen will be visible as shown in the image below.



⇨ User Interface of Fedora 64-bit will be display as shown in the figures below

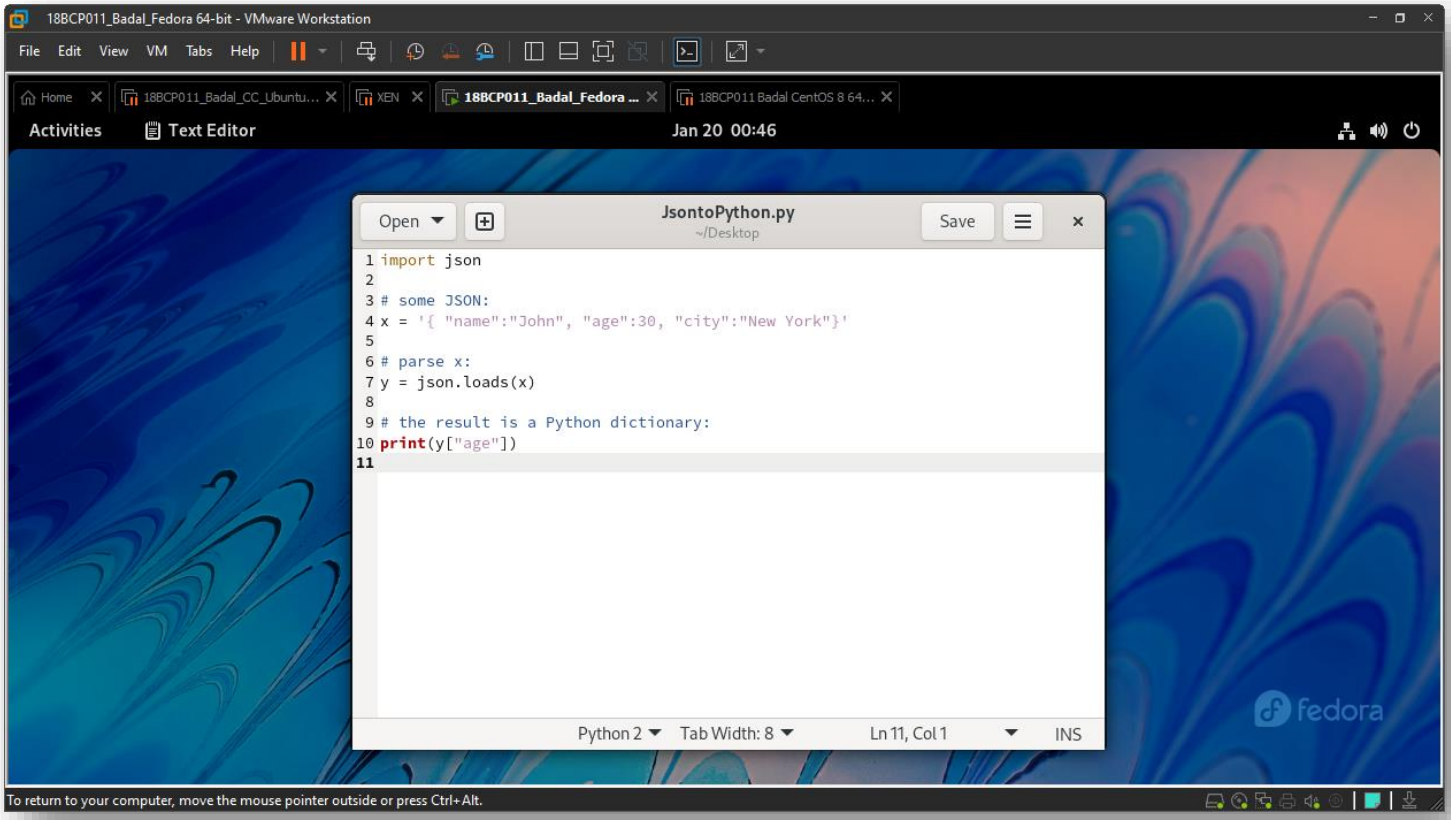
- Figure 1 dispays the configuring of Fedora 64 bit.
- Figure 2 displays the UI of **18BCP011_Badal_CC_Fedora 64-bit**.

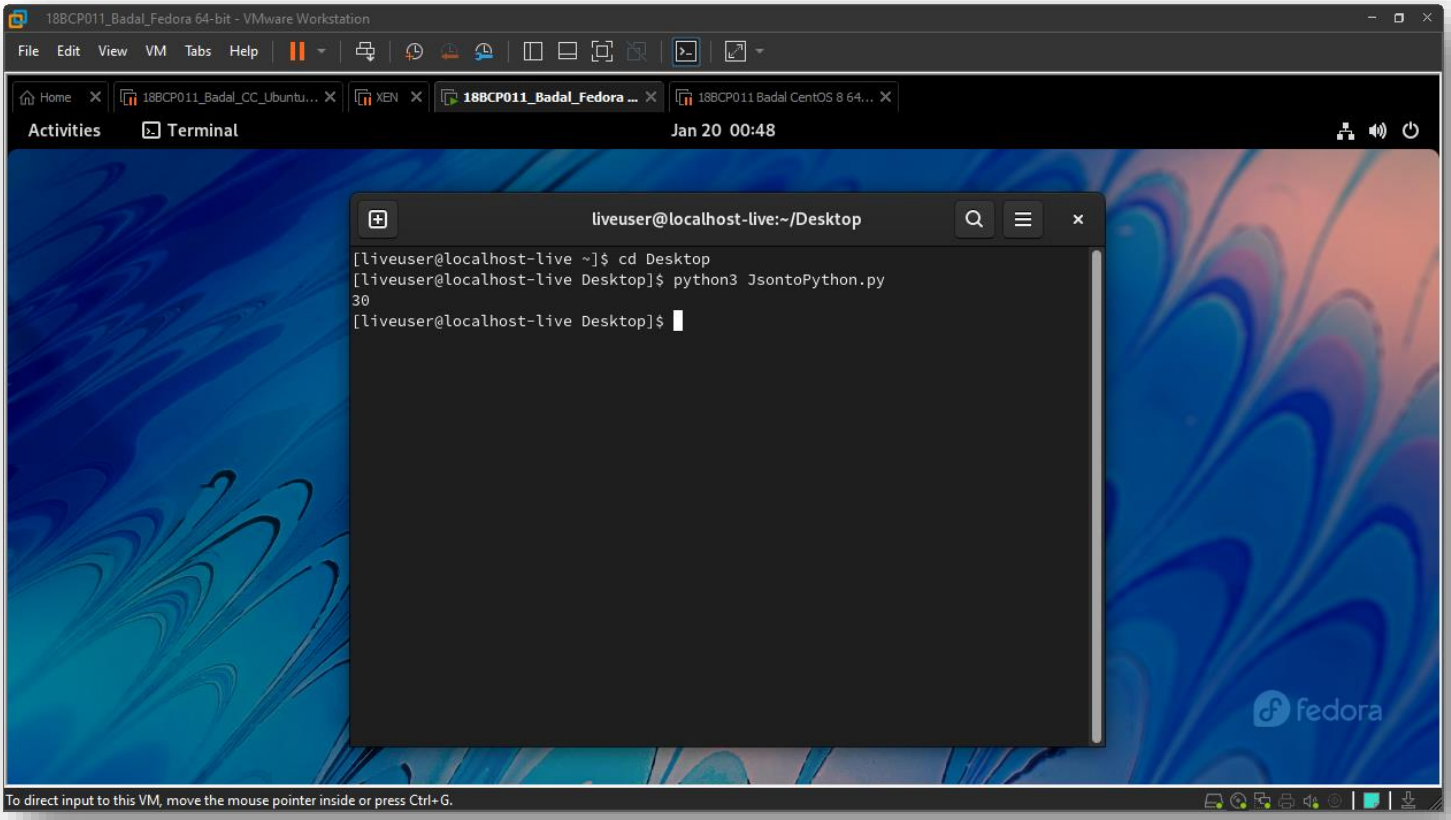


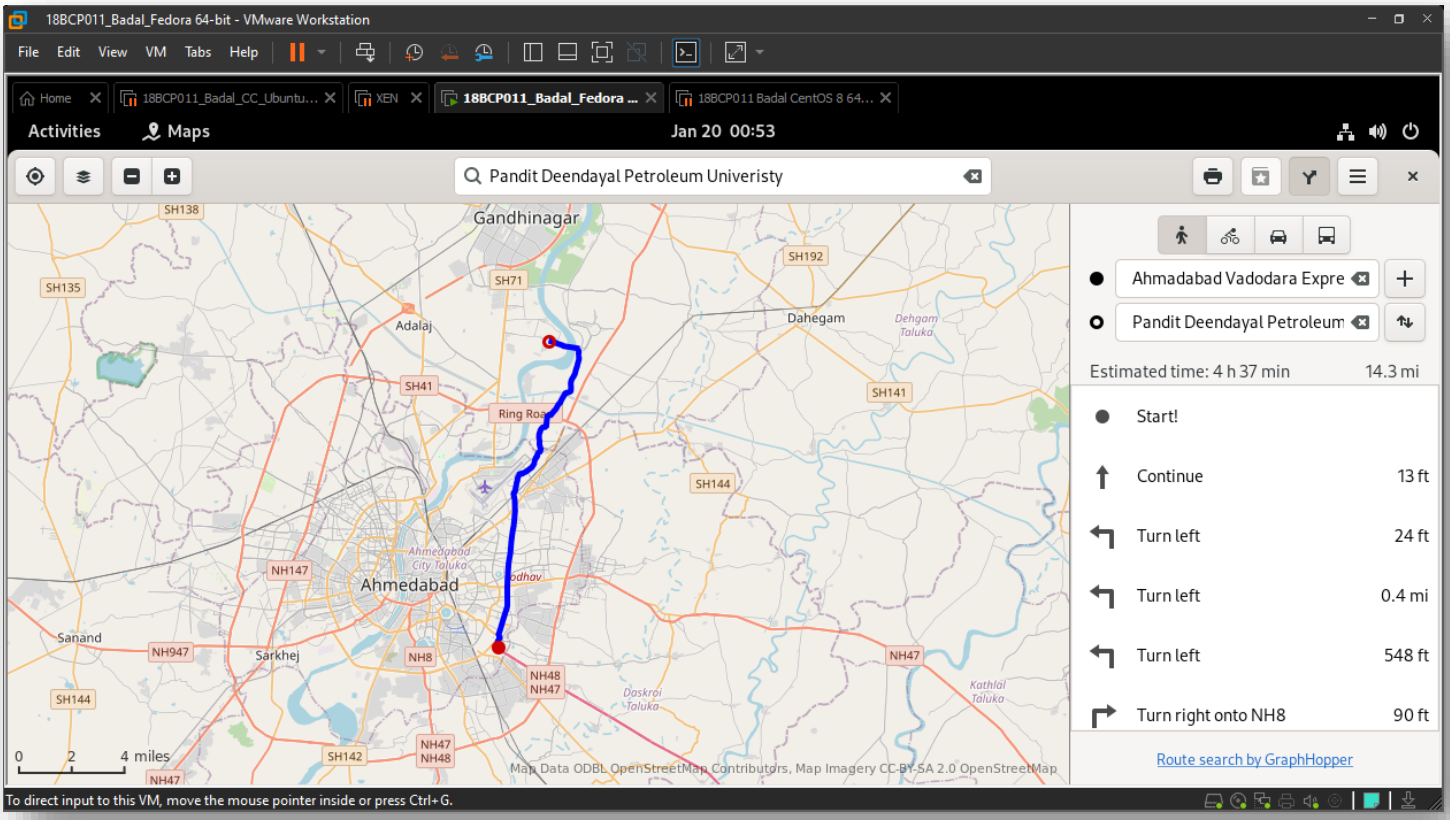


Running Simple Applications/Programs in Fedora-OS Virtual Machine.

⇨ **Figure below shows the Text Editor & Terminal running python code for Json to Python.**

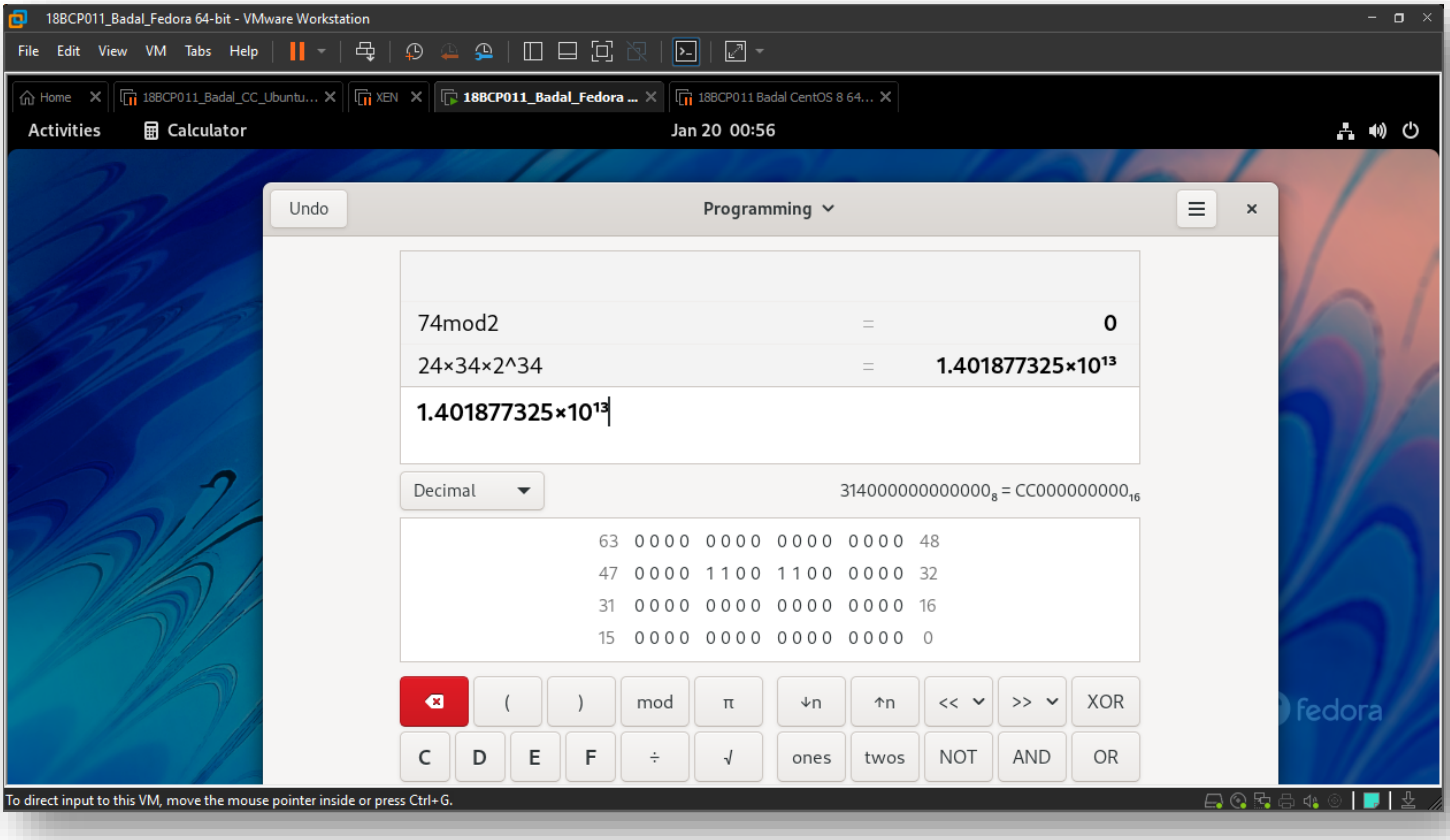




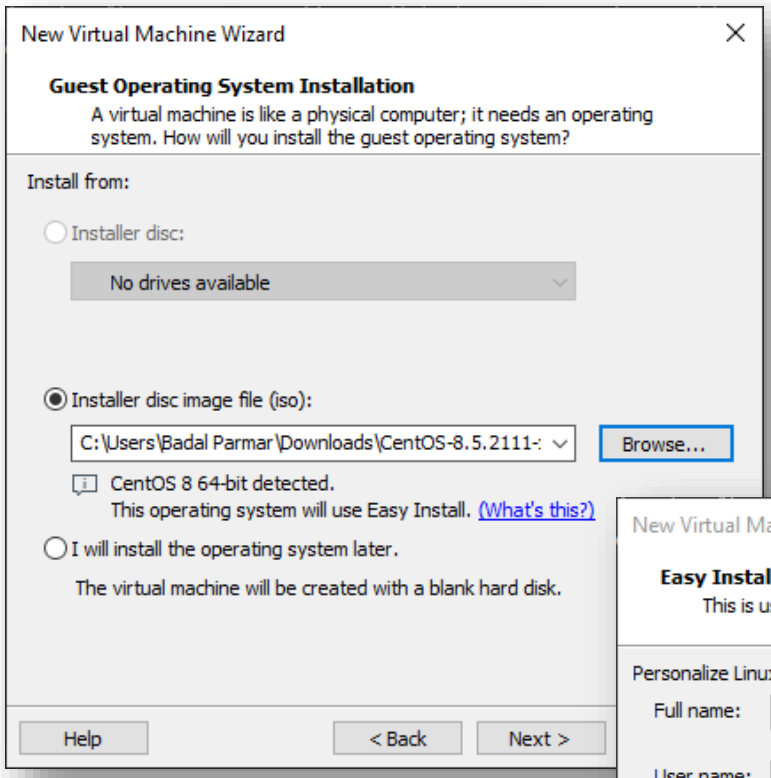


⇨ **Figure 1. Shows the working of Maps in FedoraOS Virtual Machine.**

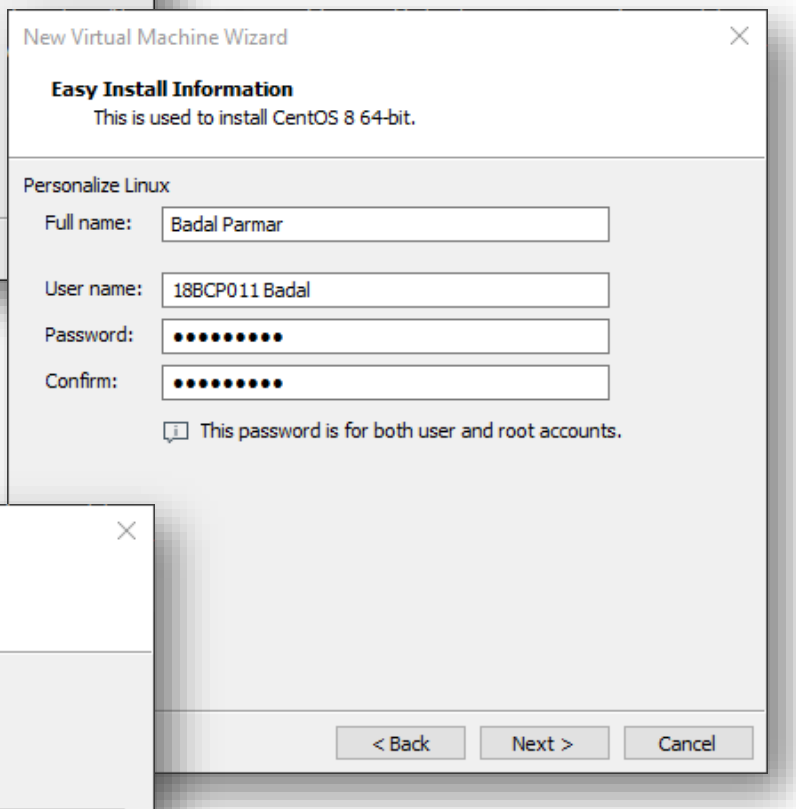
⇨ **Figure 2. Shows the working of Calculator- Programming Mode in FedoraOS Virtual Machine.**



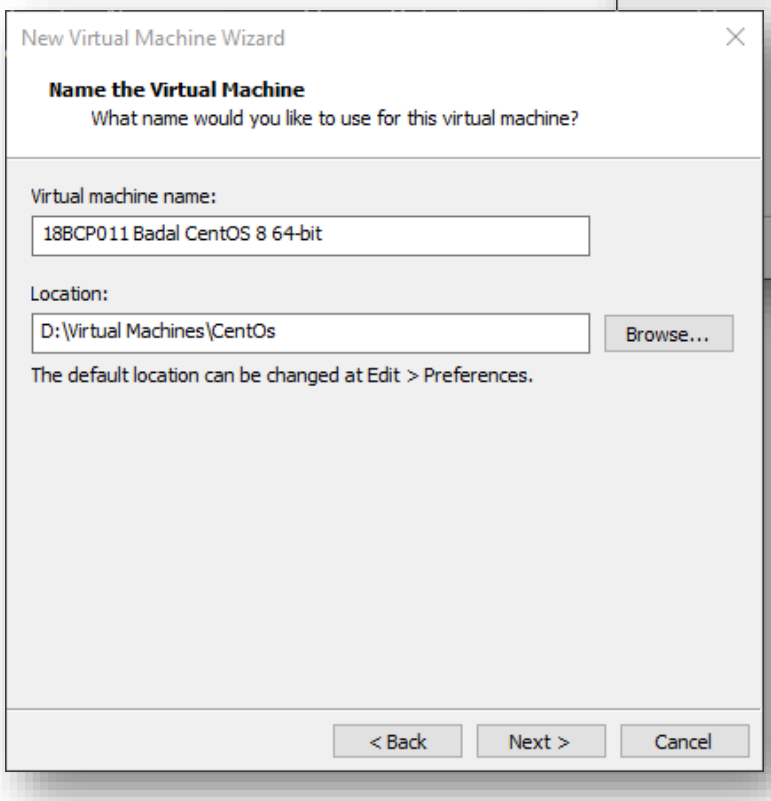
3. CentOS as Operating System in VMWare:



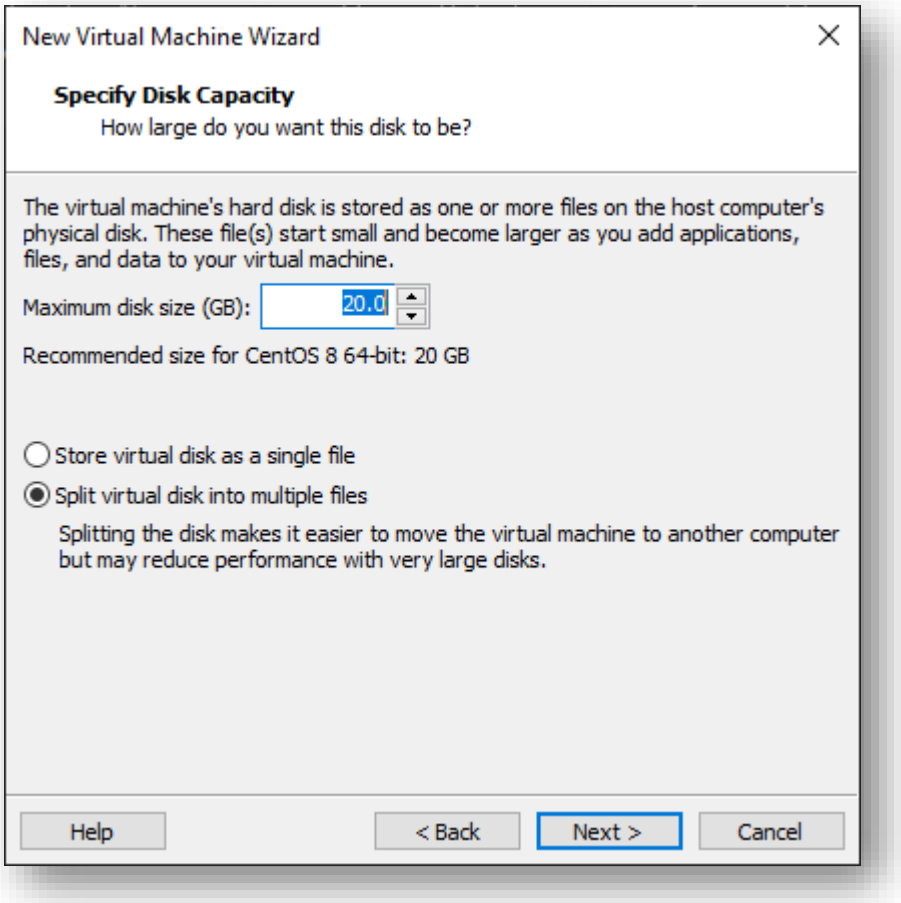
⇨ Click on the Installer Disc file (iso) and then select **Cent-OS ISO Image** from the system/laptop from the Browse Button.



Enter the personal details including Username, Password and Full Name.

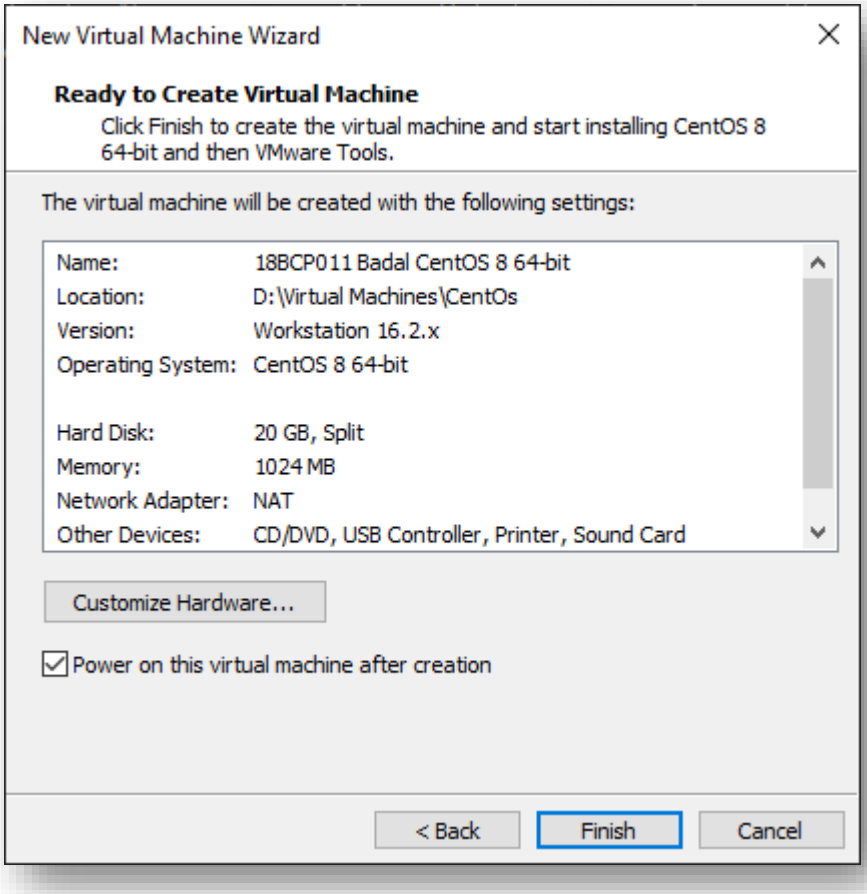


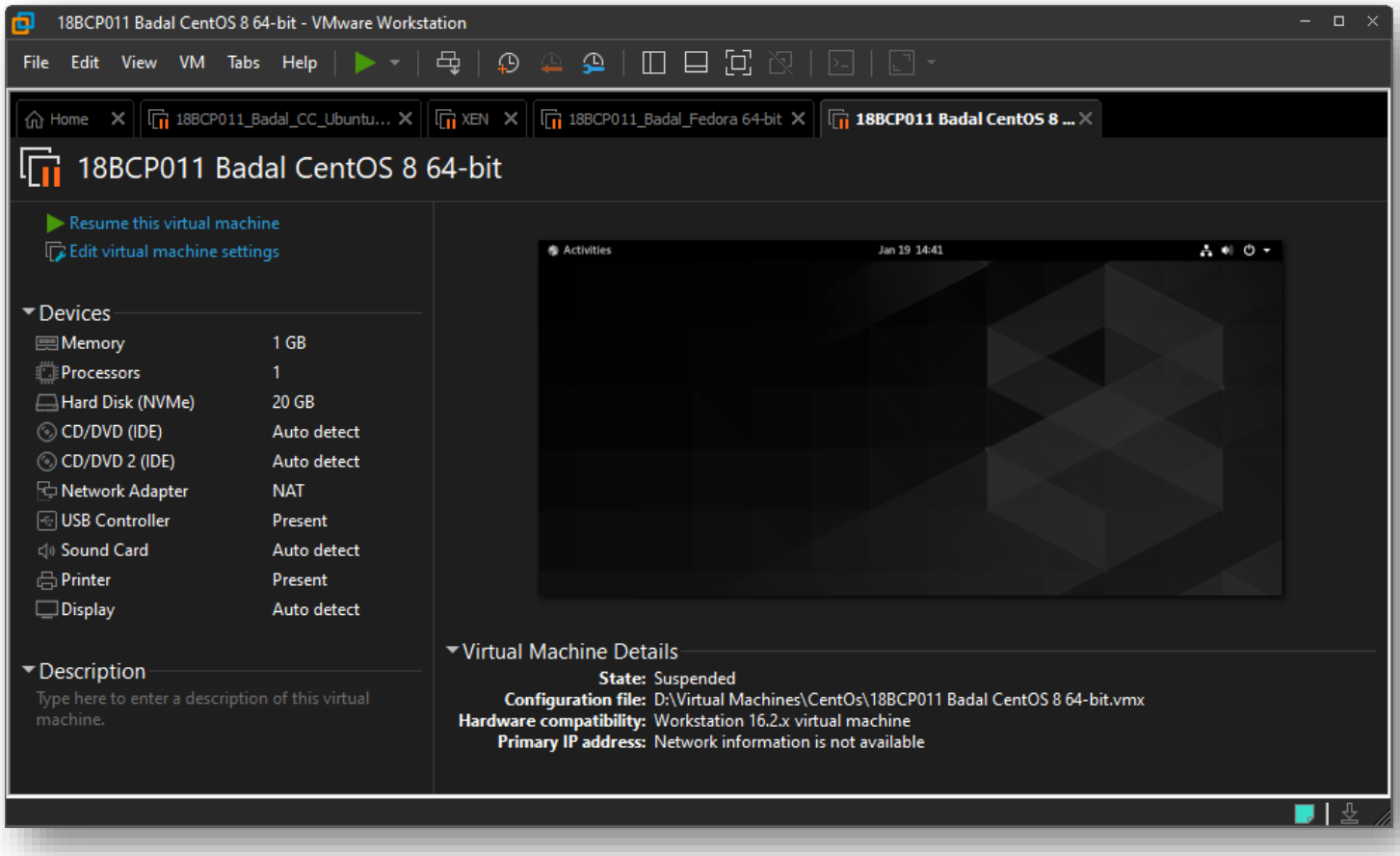
⇨ Name the Virtual Machine as 18BCP011 BadalCentOS and Click on next button.



⇨ **For Cent Operating System installation, let the default settings remain on the current page and then Click Next**

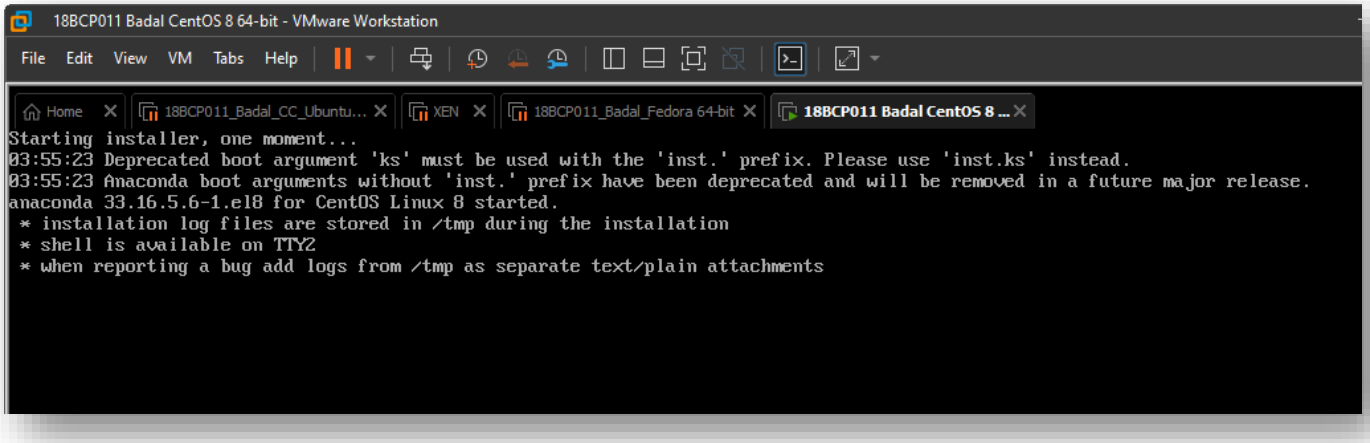
⇨ **Click on Finish button**





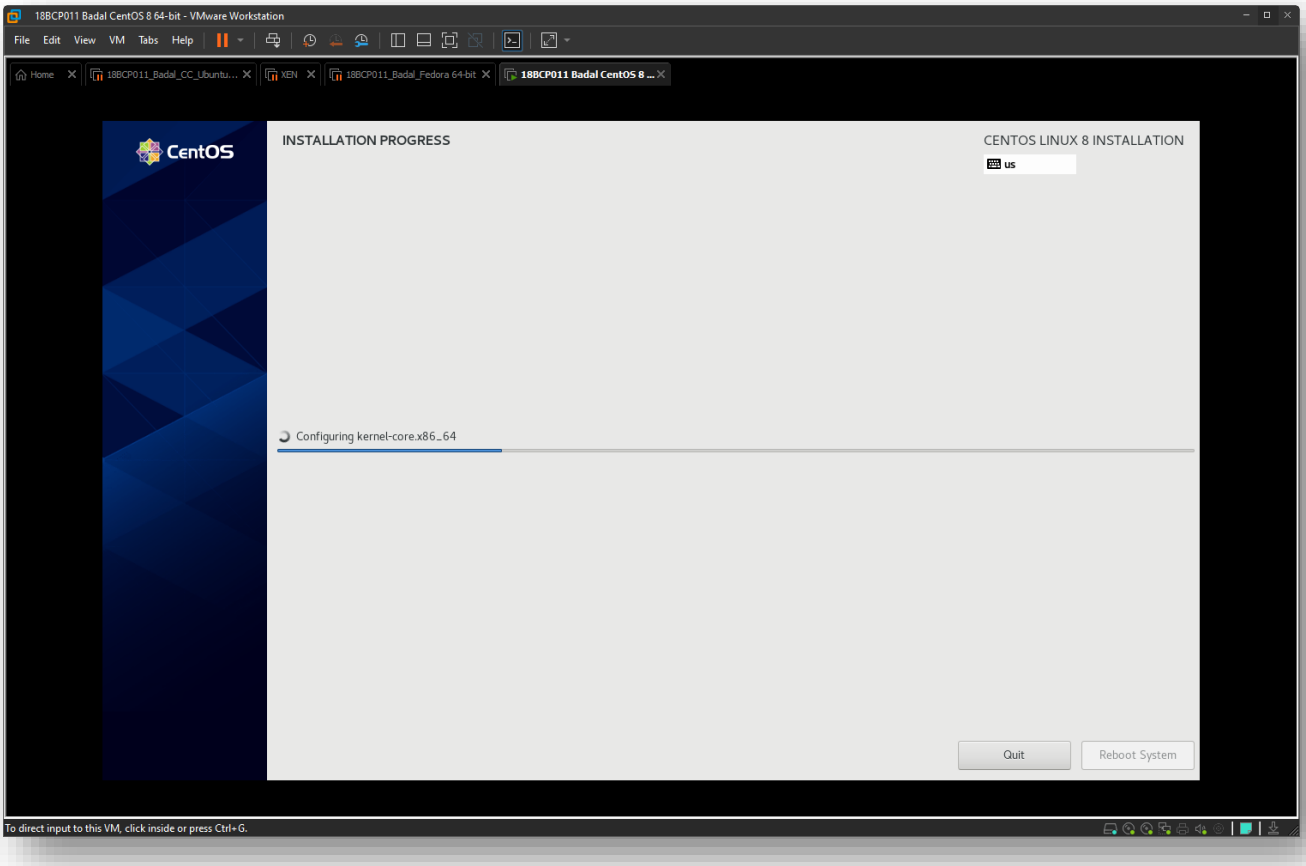
⇨ Virtual Machine for **Cent Operating System** is now created as shown in the above image and then click on **Power on this virtual machine** option to turn on the **Virtual Machine**.

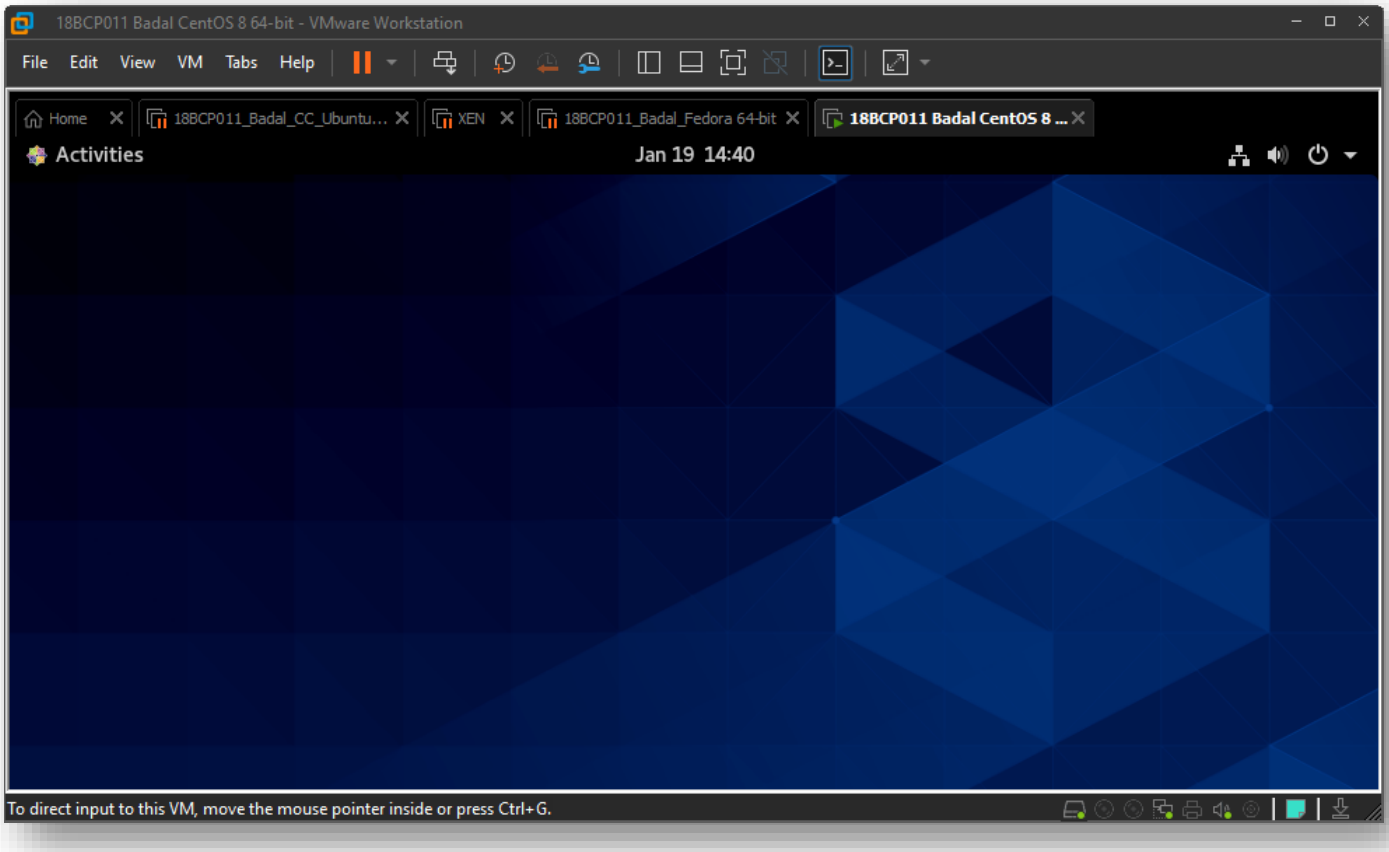
⇨ CentOS will start and the screen will be visible as shown in the image below.



⇨ User Interface of Fedora 64-bit will be display as shown in the figures below

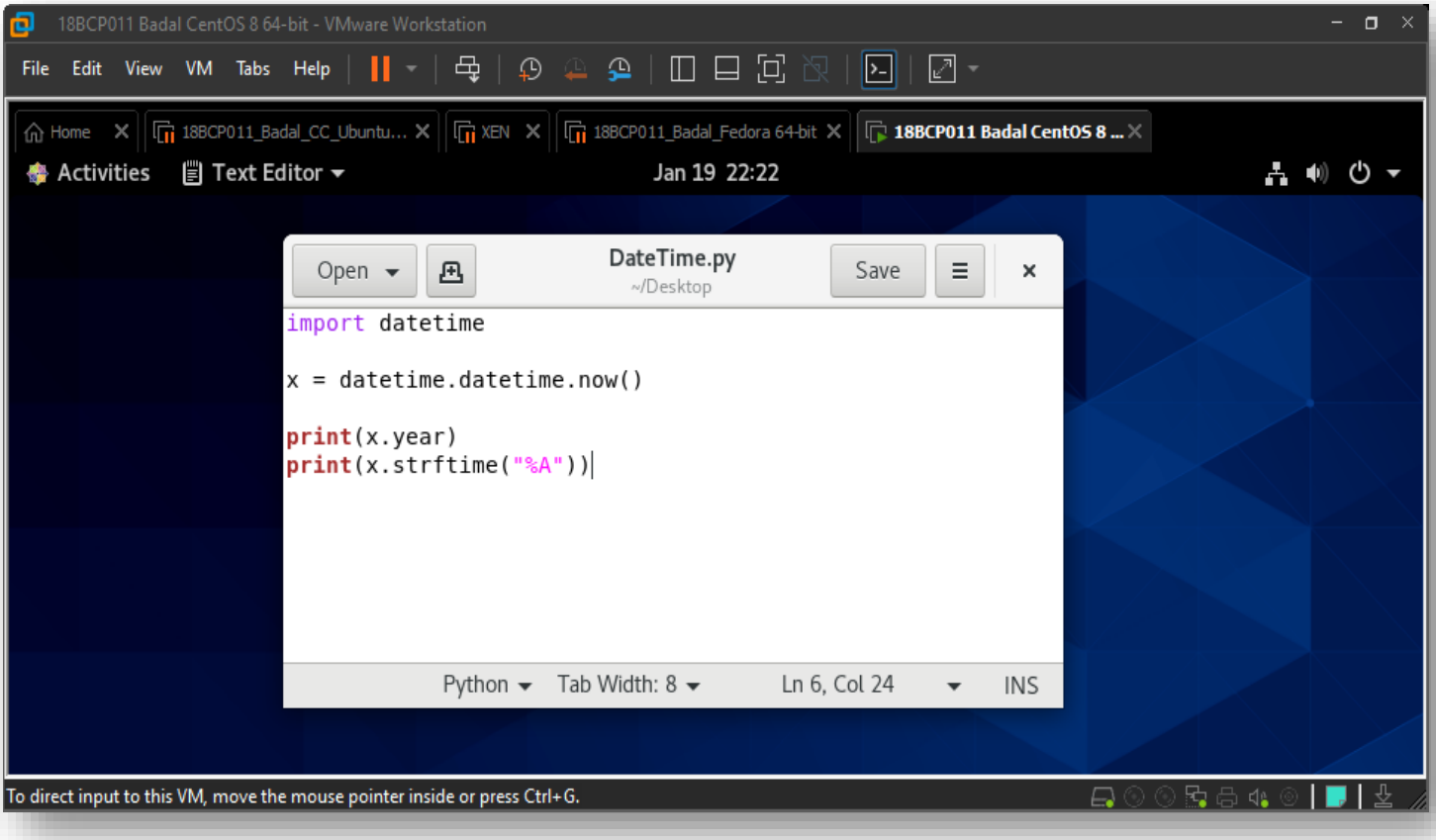
- Figure 1 dispays the Configuring of CentOS.
- Figure 2 displays the UI of **18BCP011_Badal_CentOS**.

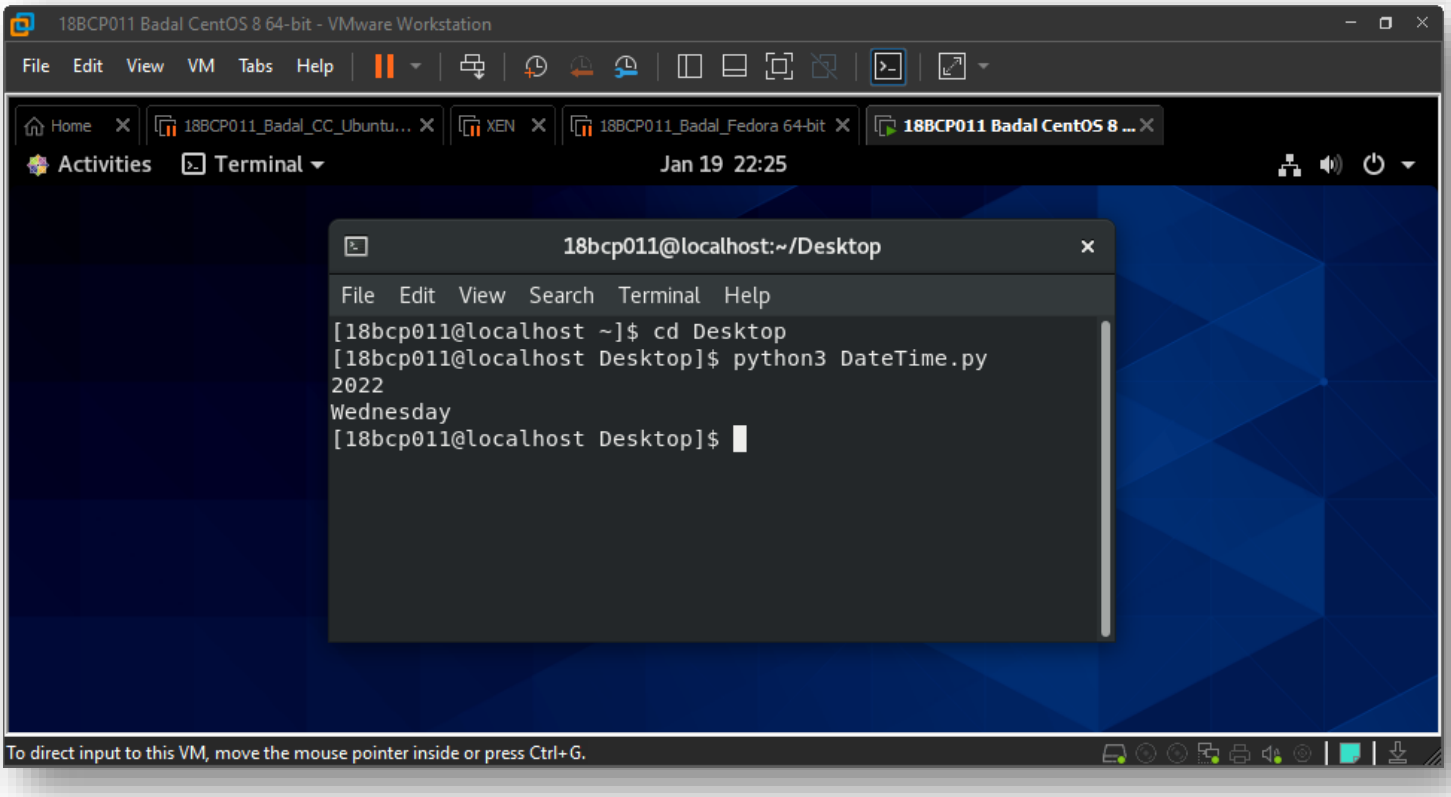


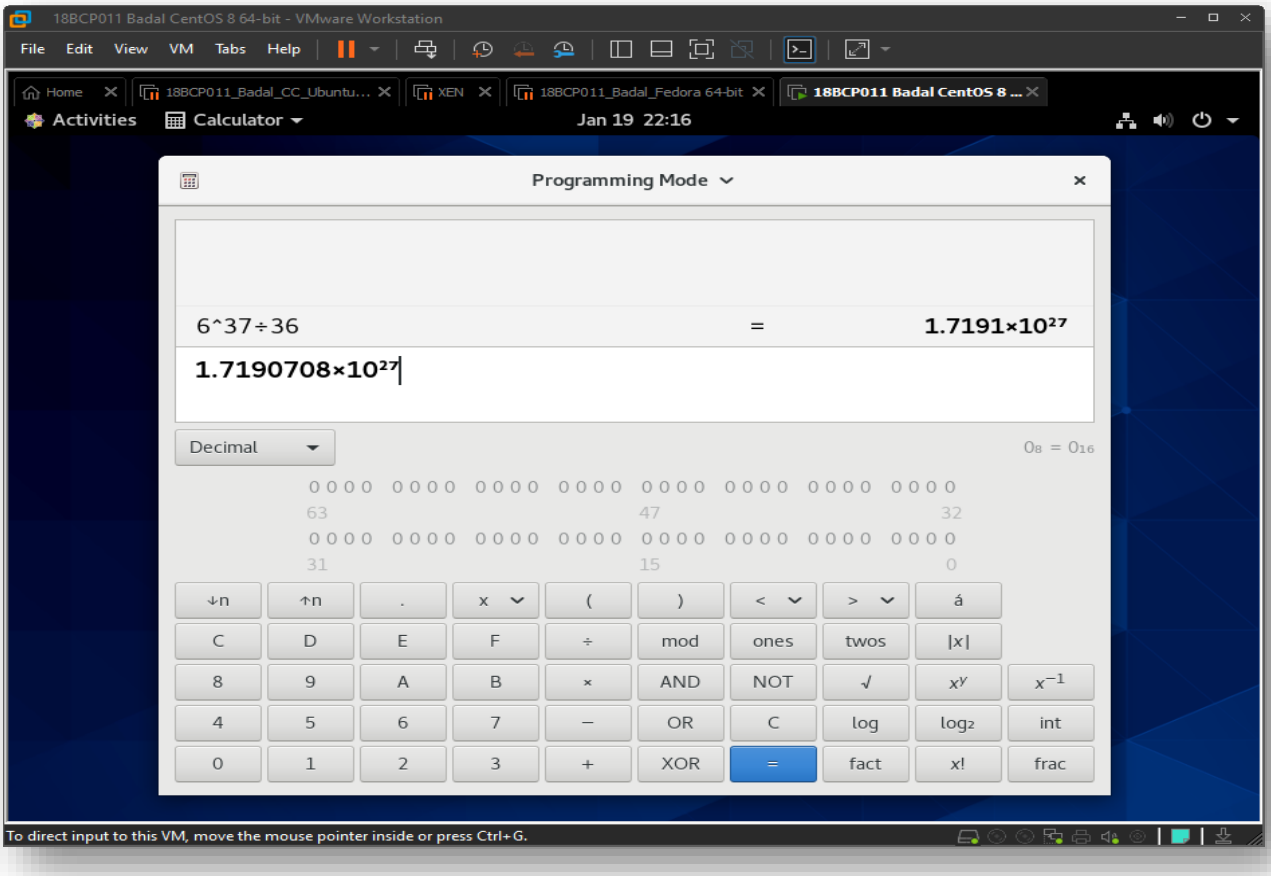


Running Simple Applications/Programs in CentOS Virtual Machine.

⇨ **Figure below shows the Text Editor & Terminal running python code for DateTime.**

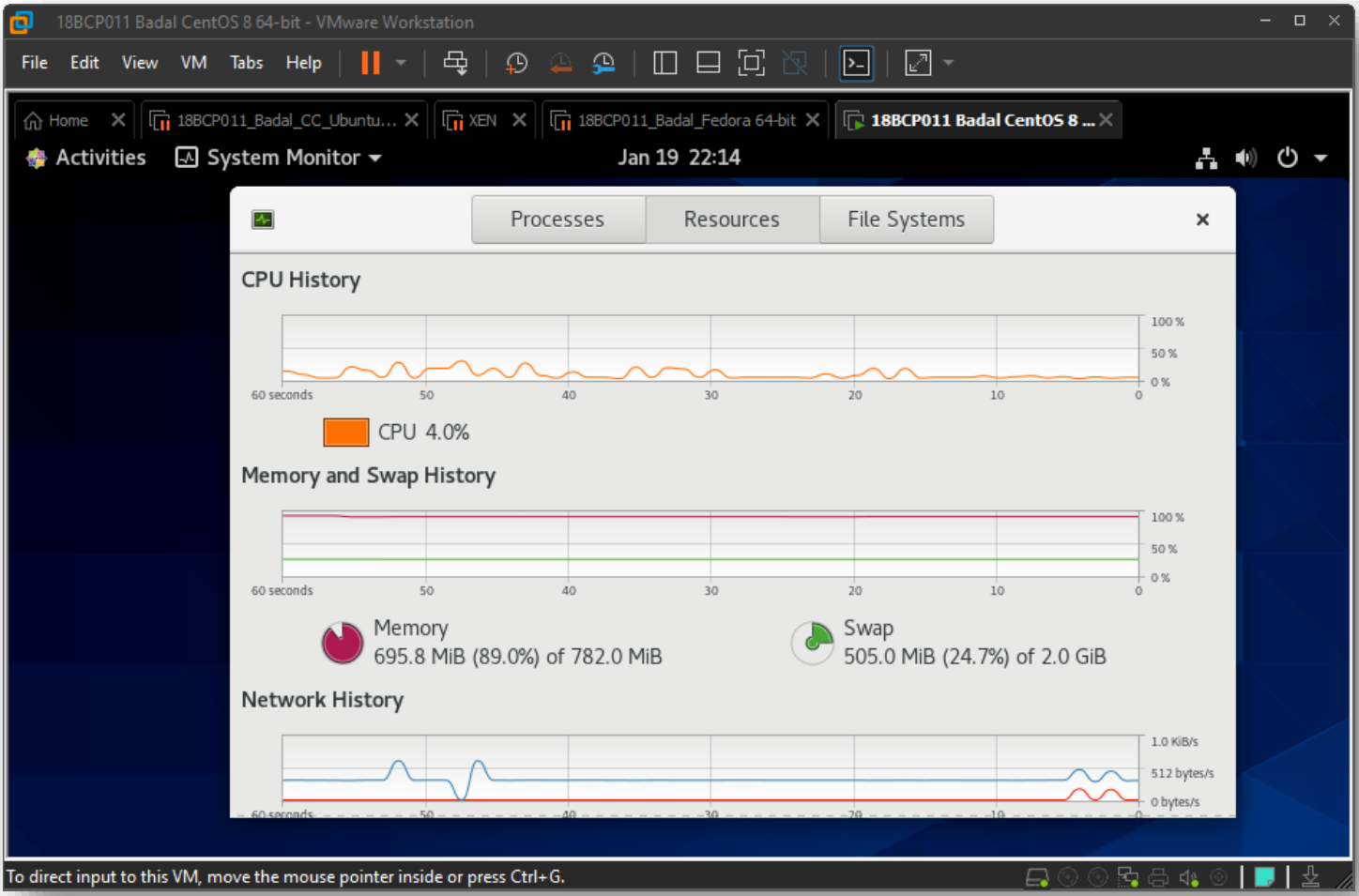






⇨ **Figure 1. Shows the working of Calculator in Programming mode in CentOS Virtual Machine.**

⇨ **Figure 2. Shows the UI of System Monitor in CentOS Virtual Machine.**

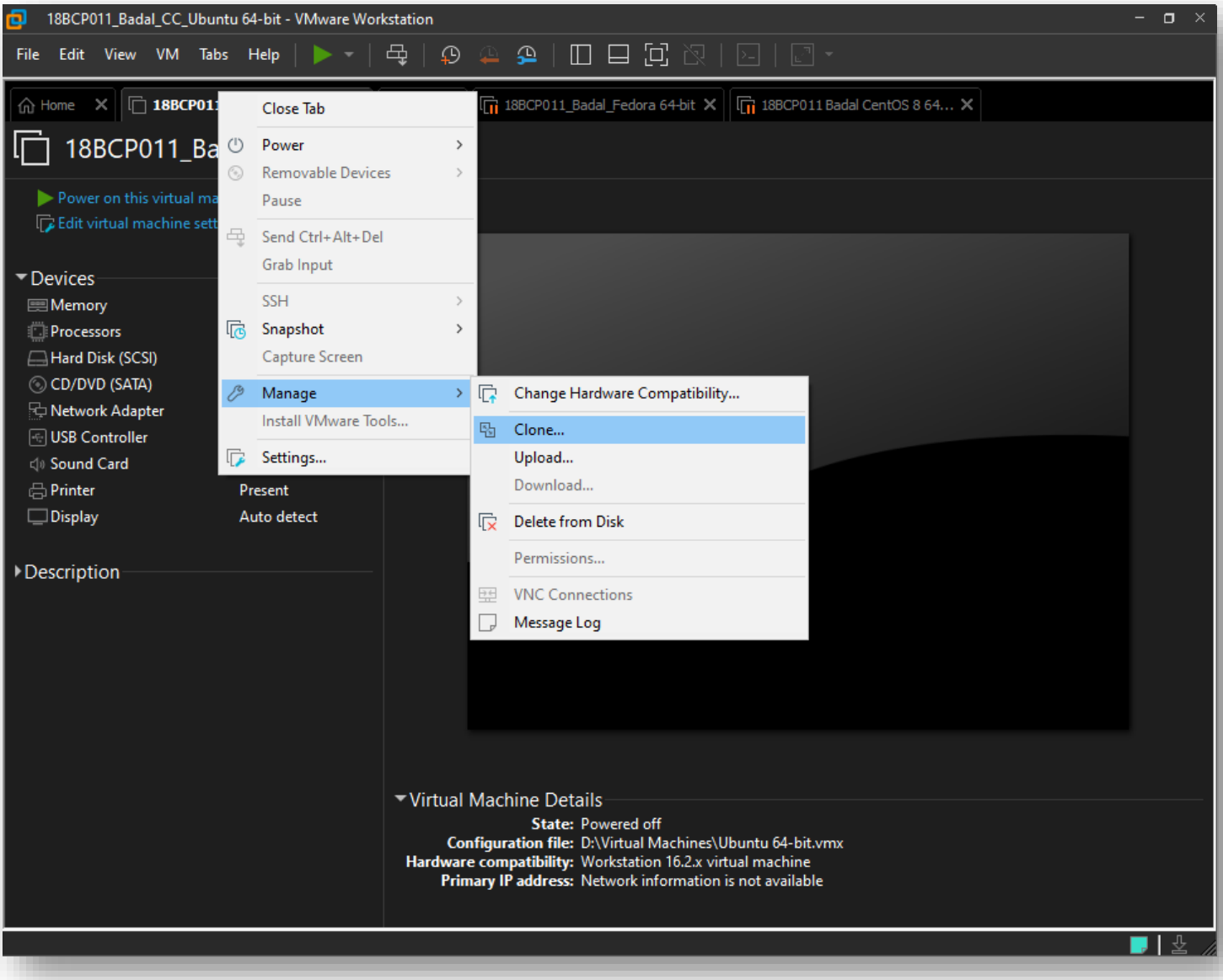


CLONING OF UBUNTU VIRTUAL MACHINE

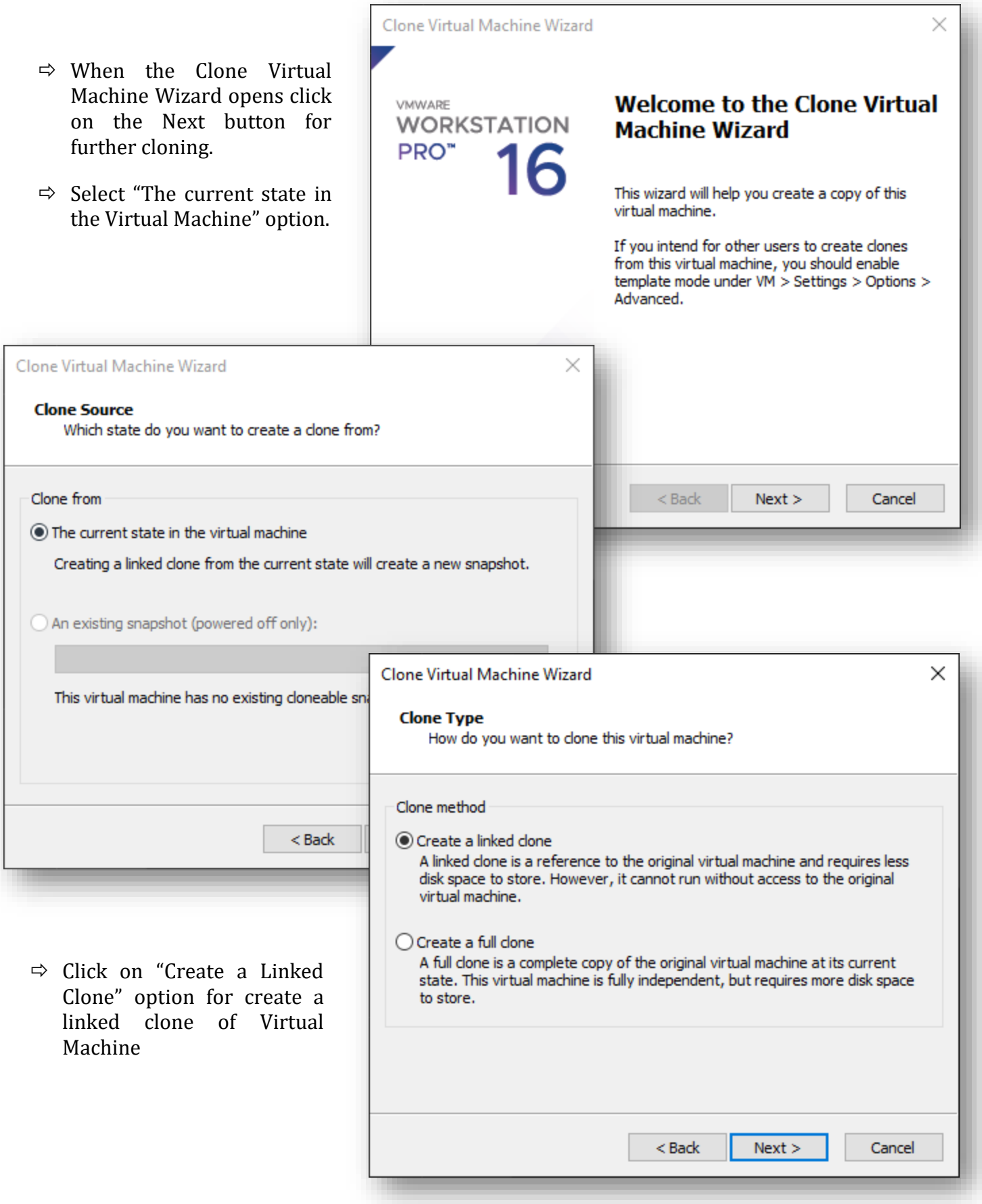
Steps for Cloning a Virtual Machine in VMWare Workstation:

1. **Right Click on the Virtual Machine one want to Clone.**
2. **Click on Manage ➔ Clone**
3. **A dialog box will pop-up for Cloning of Virtual Machine.**
4. **Click Next and follow the steps accordingly for Cloning of Virtual Machine**

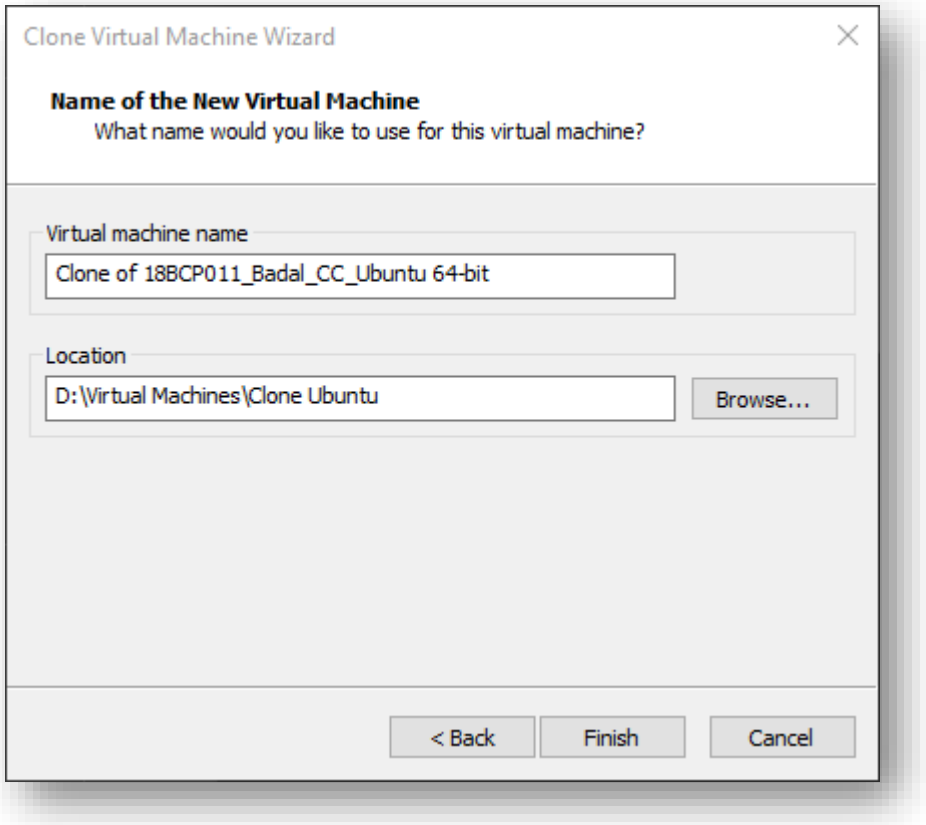
***Note: Machine should be in Power Off Mode and not suspended or pause state for Cloning.**



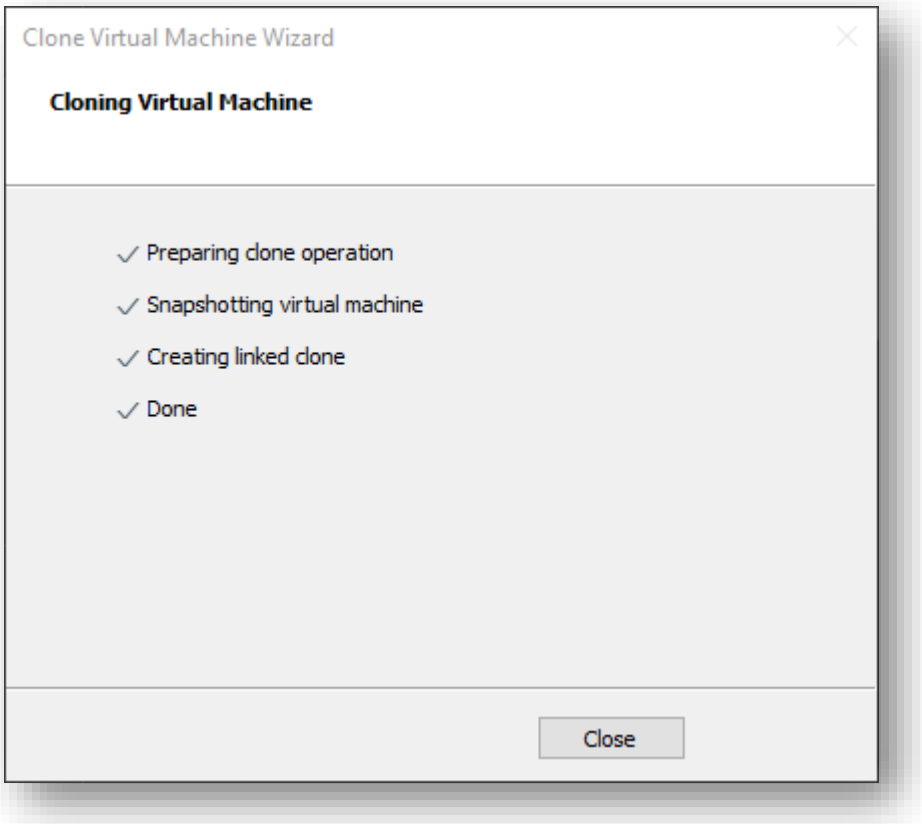
- When the Clone Virtual Machine Wizard opens click on the Next button for further cloning.
- Select “The current state in the Virtual Machine” option.

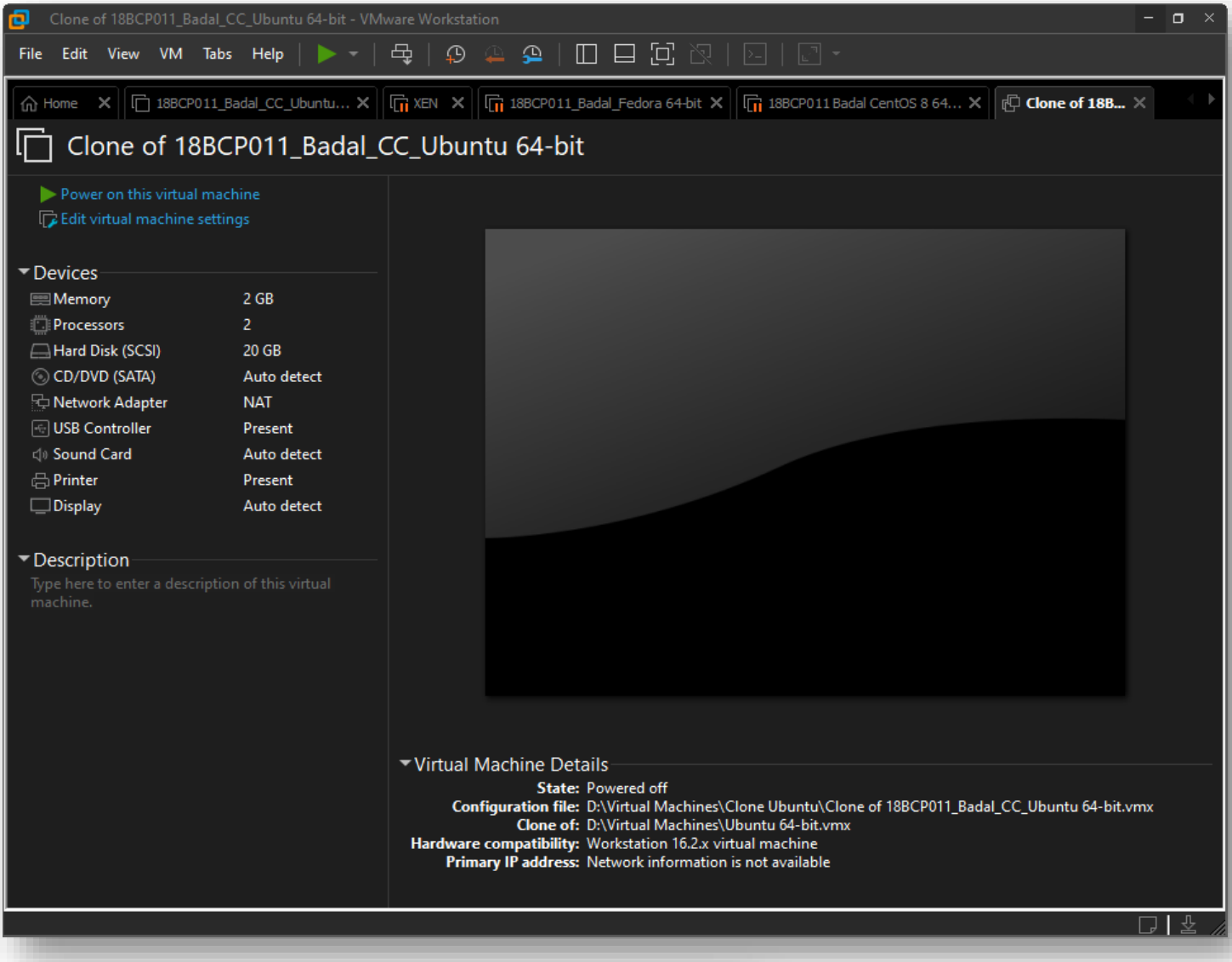


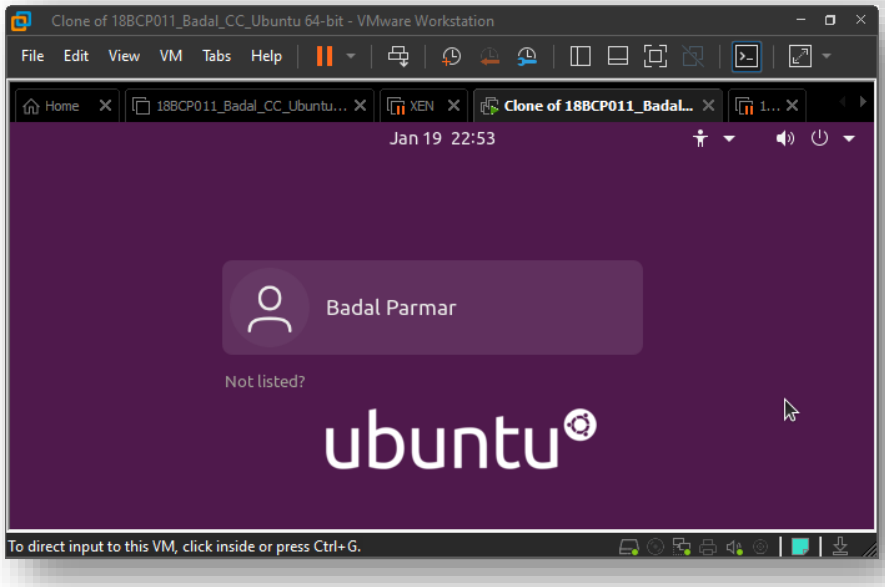
- Click on “Create a Linked Clone” option for create a linked clone of Virtual Machine



- ⇨ When the Clone Virtual Machine Wizard opens name the Virtual Machine and assign the Location path for the same. Click on Finish Button to complete the cloning.
- ⇨ Cloning of Virtual Machine will complete in a while, click on the Close button.

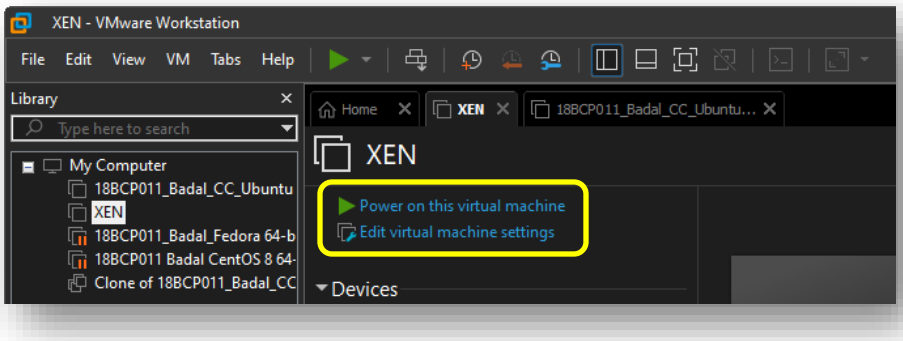




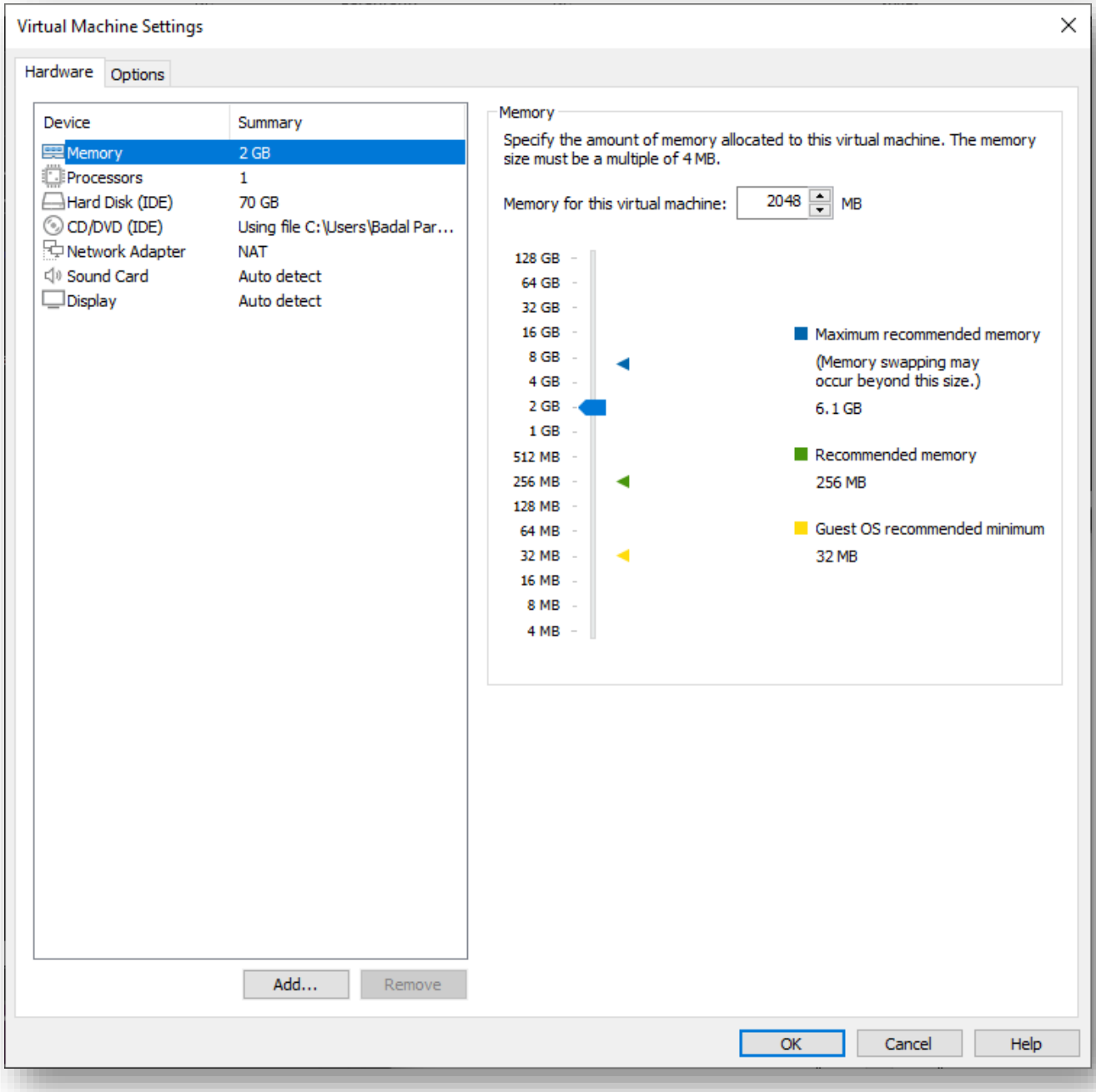


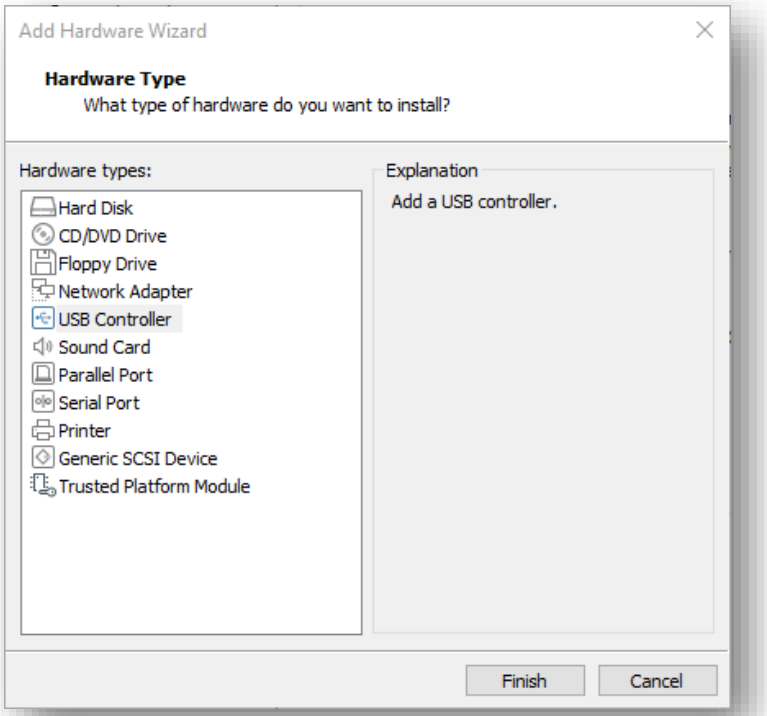
- After Cloning **"Clone of 18BCP011_Badal_CC_Ubuntu 64-bit"** will be created, power on the the Virtual Machine.
- Virtual Machine will turned on and the login credentials will be same as the previous Ubuntu Virtual Machine.

ADDING USB CONTROLLER TO VIRTUAL MACHINE

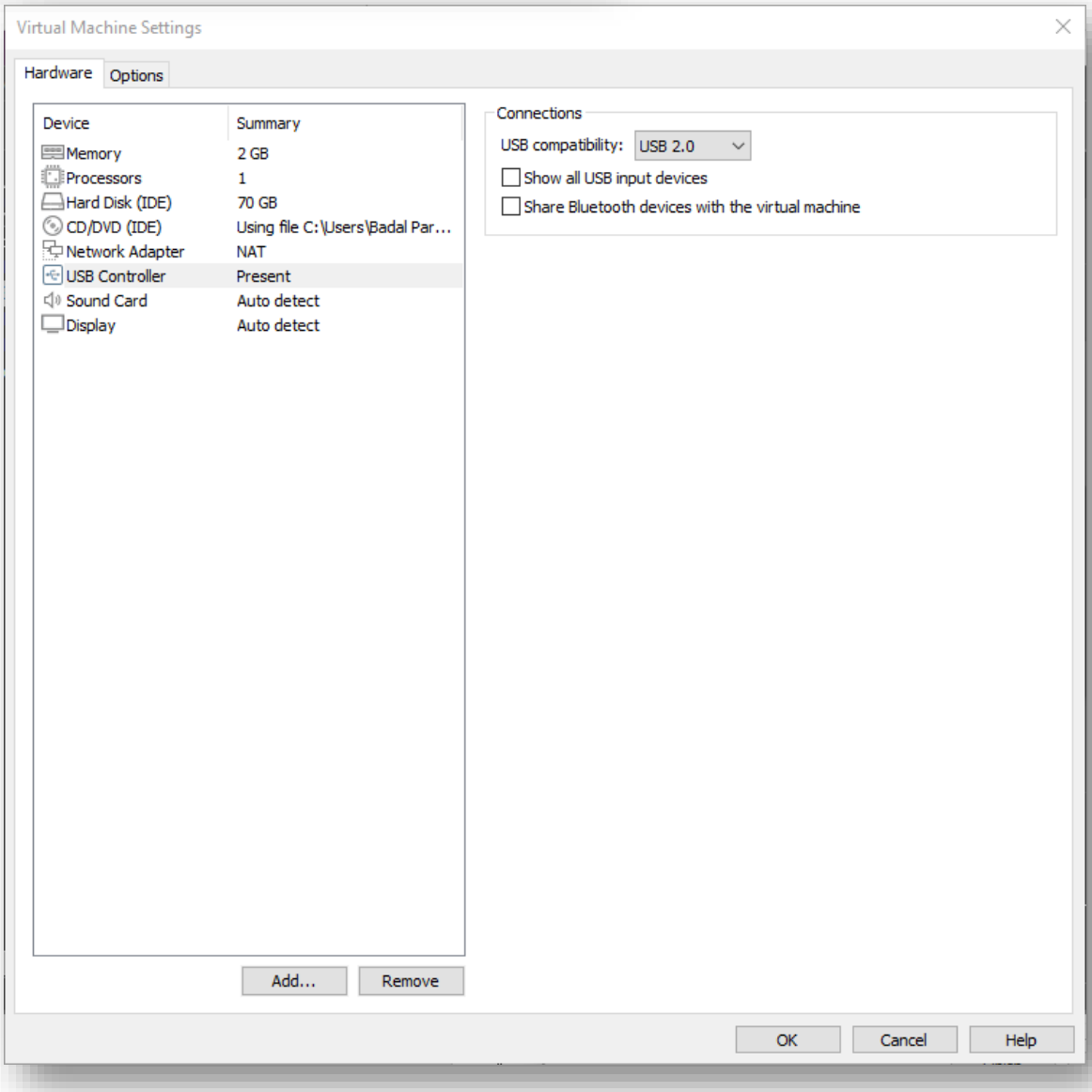


- ⇨ Power off the Virtual Machine and click on **"Edit Virtual Machine Settings"** to open Virtual Machine Settings.
- ⇨ Click on Add. Button to open **"Add Hardware"** Dialog box

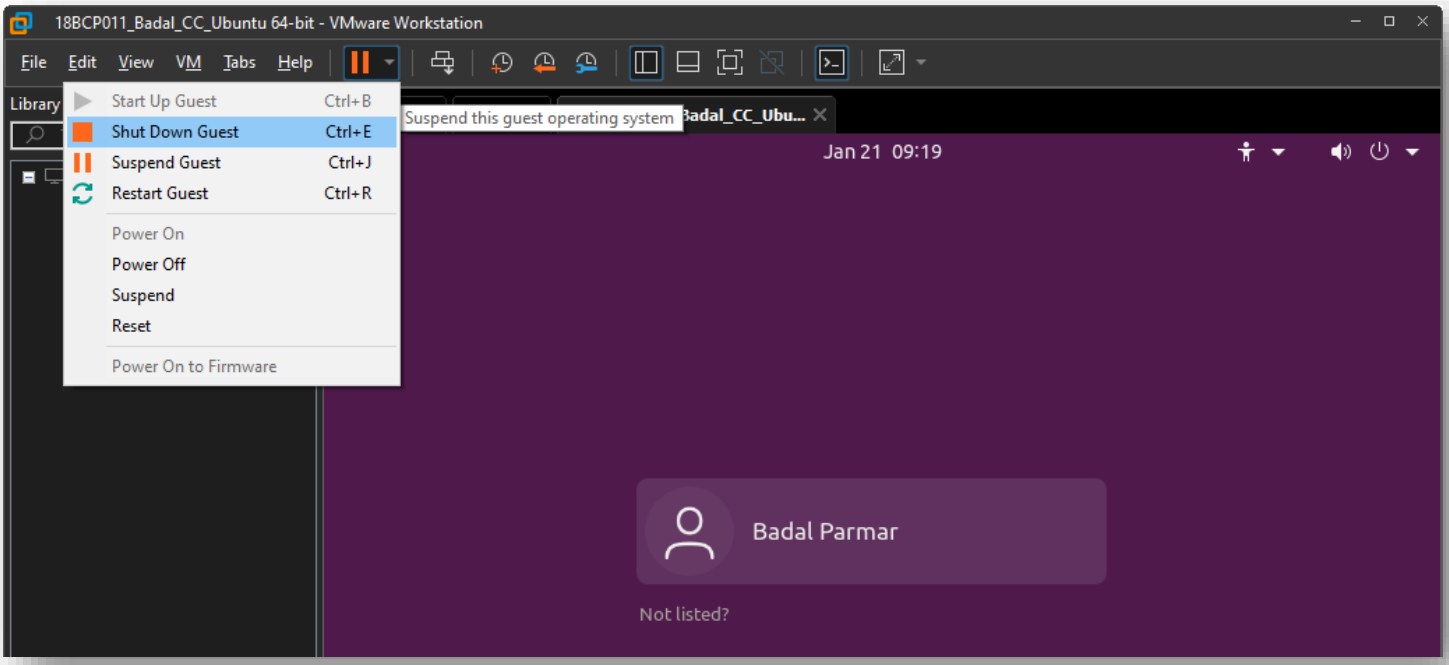




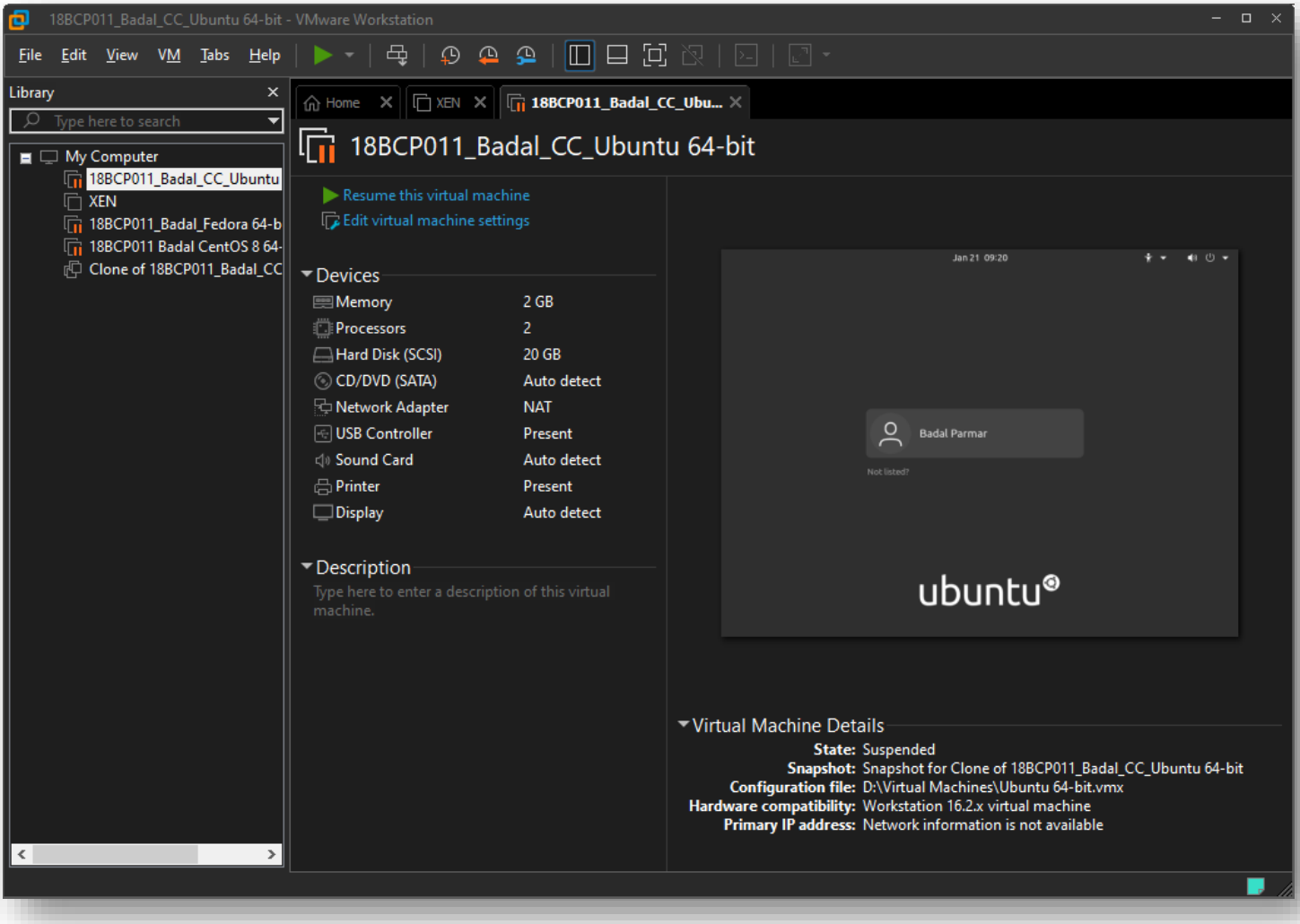
- After clicking on Add button, **"Add Hardware Wizard"** dialog box will pop-up click on **"USB Controller"** to add USB controller to Virtual Machine.
- Click "**Finish**" to add hardware to the machine.
- USB Controller will be added as shown in the figure below.



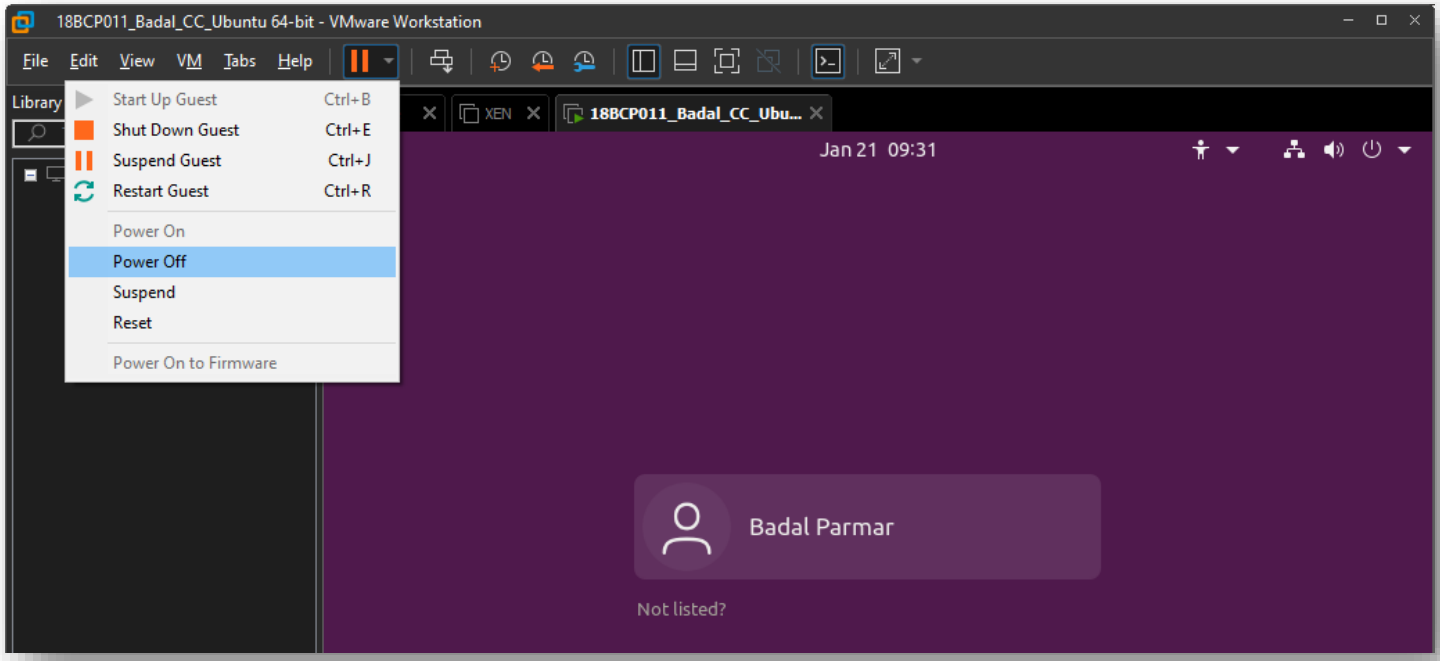
Closing Virtual Machines (a. Soft Power off/Suspend and Resume VM)



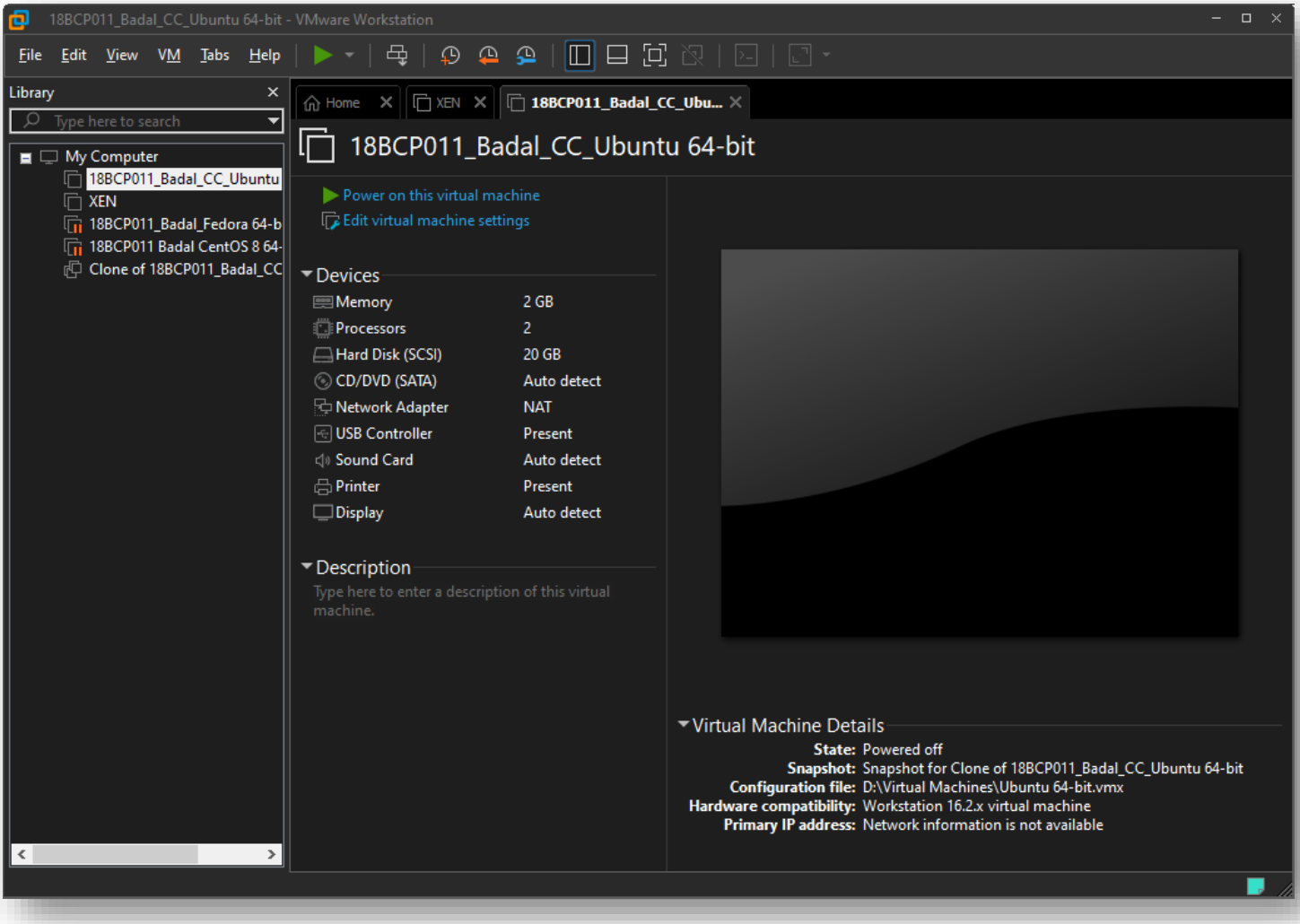
- ⇨ For Soft Power Off, Click on small arrow and select “Shut Down Guest” Option for Shut down the Virtual Machine.
- ⇨ The Virtual Machine will shut down as shown in the figure below.



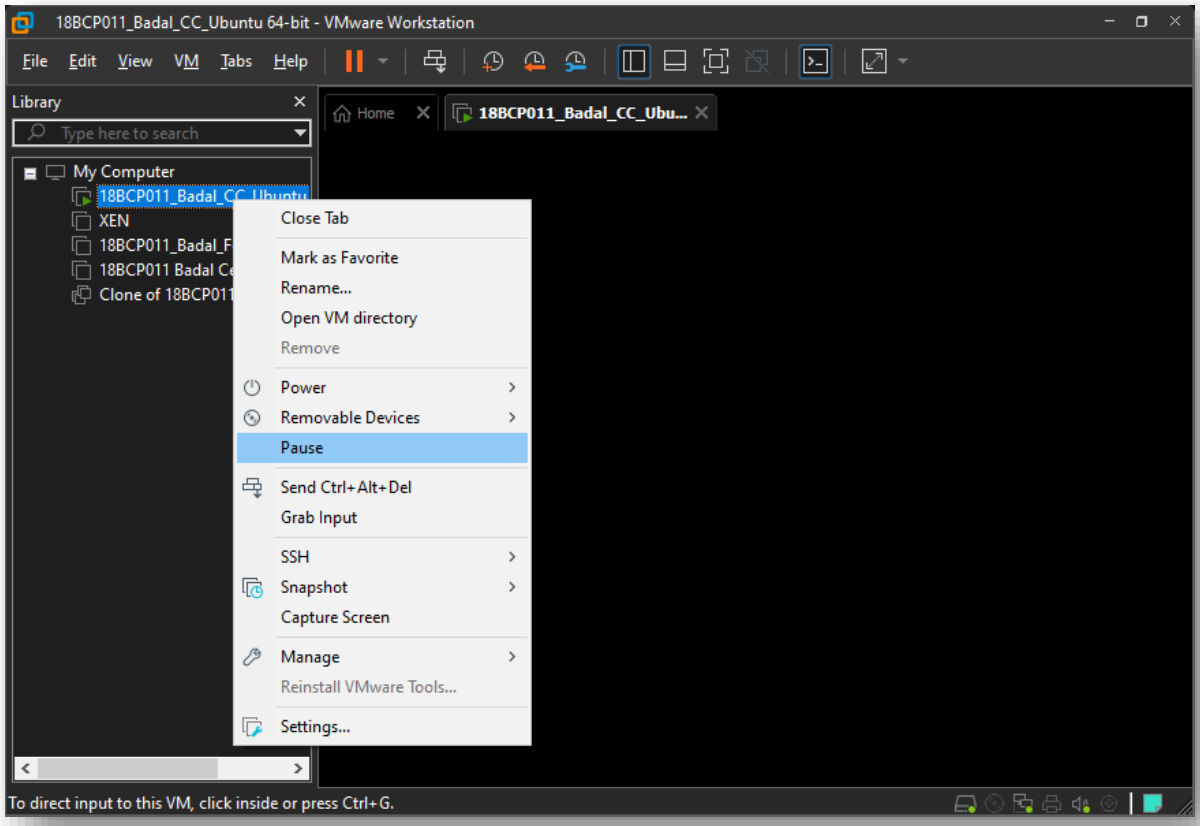
Closing Virtual Machines (b. Power Off/Hard Suspend and Turn On VM)



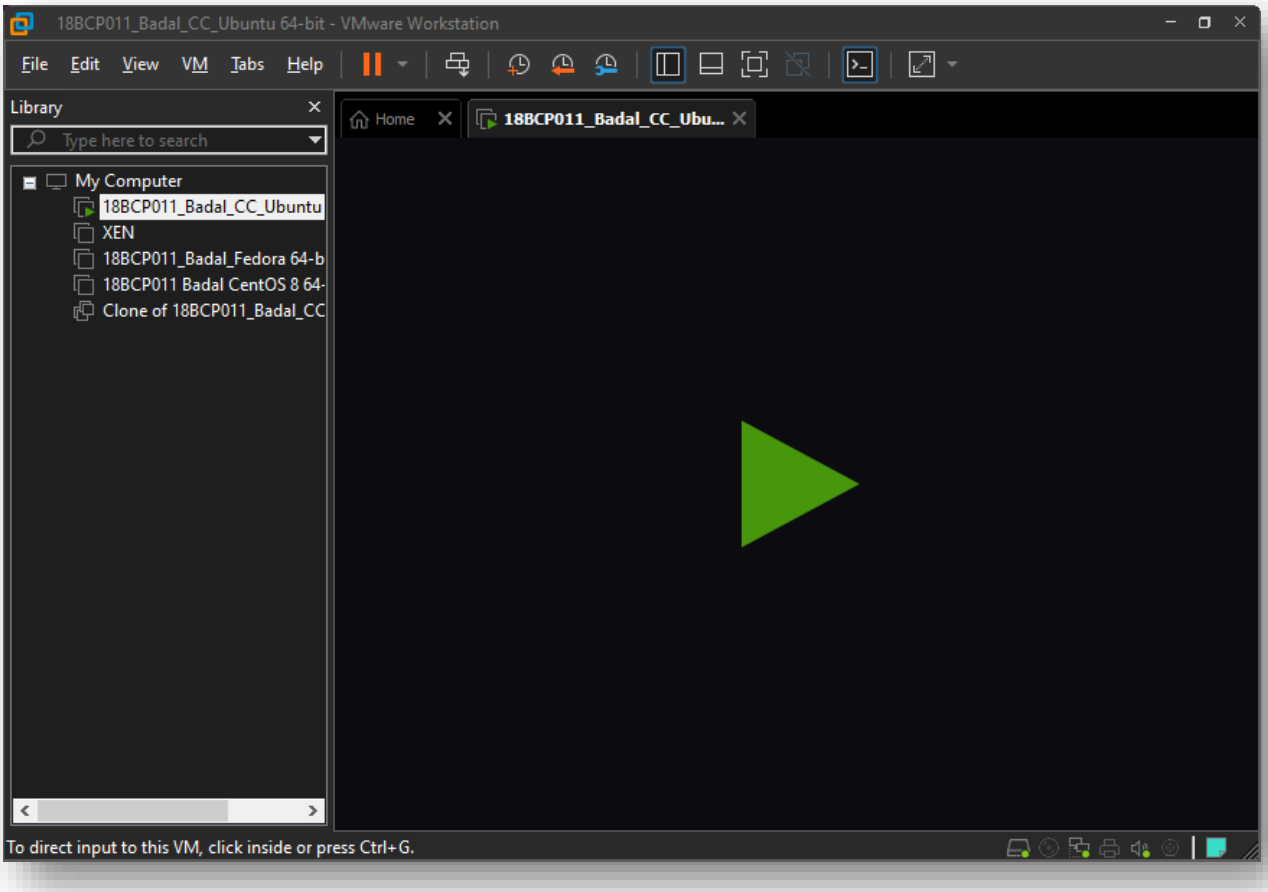
- ⇨ For Hard Power Off, Click on small arrow and select “Power Off” Option for Power Off/Shut down the Virtual Machine.
- ⇨ The Virtual Machine will Power Off as shown in the figure below.



Closing Virtual Machines (c. Pause and Resume Virtual Machine)



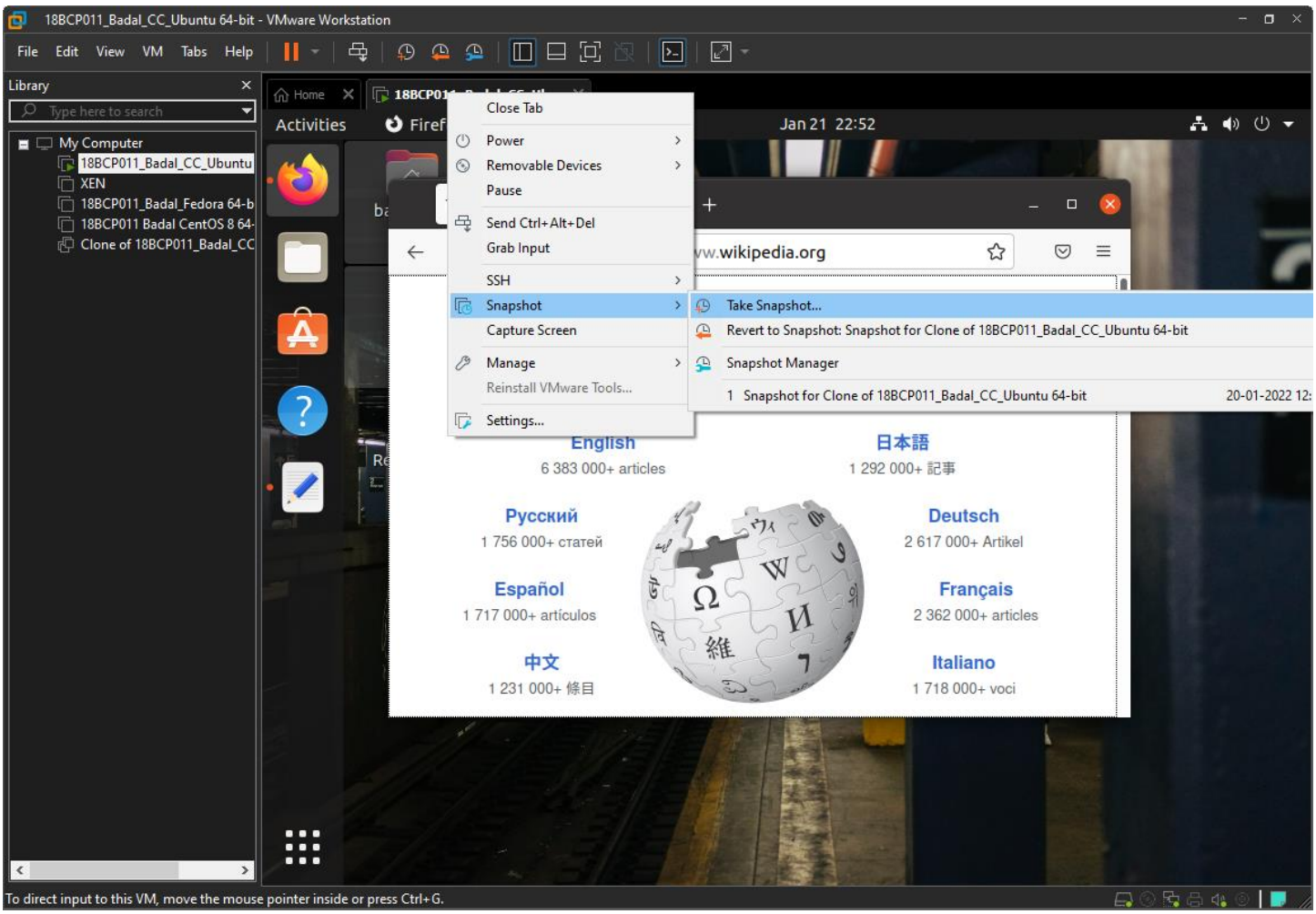
- ⇨ For Hard Power Off, Click on small arrow and select “Power Off” Option for Power Off/Shut down the Virtual Machine.
- ⇨ The Virtual Machine will Power Off as shown in the figure below.

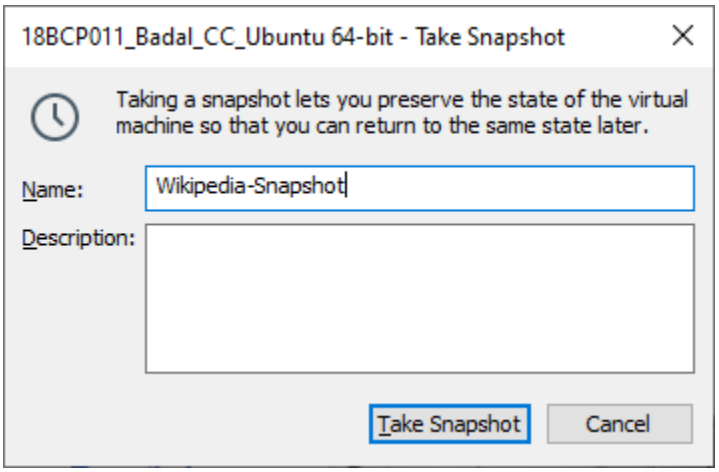


Closing Virtual Machines (d. Snapshot the Virtual Machine)

⇨ Steps for Snapshotting a Virtual Machine

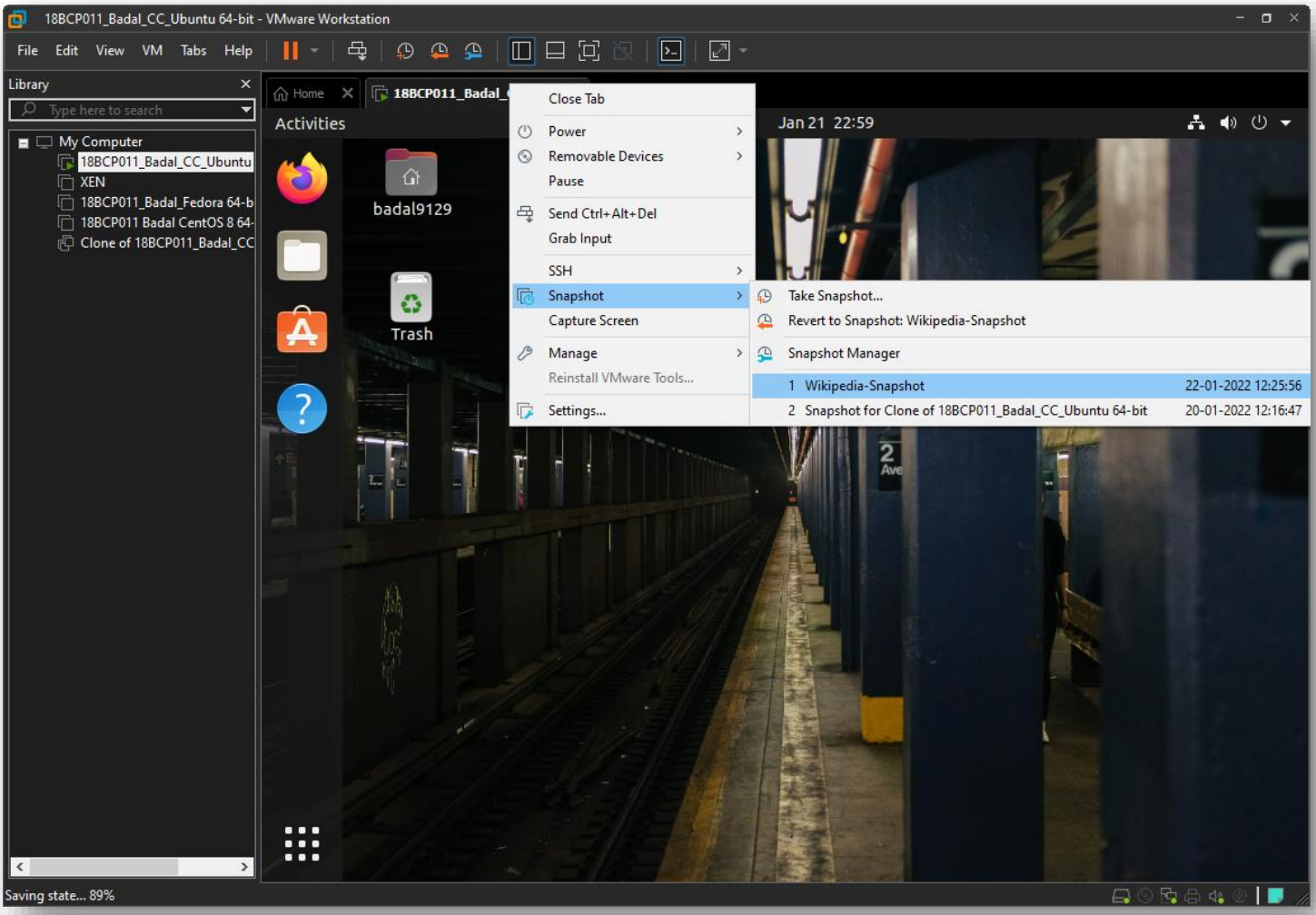
1. **Power On** a virtual machine lets say **Ubuntu** as shown in the Figure 1. below.
2. Open any **Sevices/Application** and **run any program** till the point you wanna **Snapshot the Virtual Machine.**
3. **Right Click** on the Virtual Machine and **Select Snapshot** option as shown in the Figure 2 below.
4. The **Snapshot of the Virtual Machine** will be done and VM can be recovered to this state at any point of time





⇨ Once the Snapshot is taken it can be seen and access by Right Clicking VM ➔ Snapshot ➔(Snapshot Taken)

⇨ On Clicking the Existing Snapshot the Virtual Machine will get back to Checkpoint State.



- Snapshot can be taken directly by clicking on the icons marked in the above figure.

⇨ To take snapshot of Existing Virtual Machine.

⇨ Revert Back to the Snapshot taken previously

⇨ To Manage the snapshots of Virtual Machine.

DELETING THE VIRTUAL MACHINE

⇨ Steps for Deleting a Virtual Machine from Disk

1. Right Click on the Virtual Machine one wanna delete/remove.
2. Scroll Down toward Remove Option
3. On Clicking the Remove option, Remove VM dialog box will pop-up
4. Finally, the Remove option will delete the Virtual Machine as shown in the snapshot below.