Assignment 4:

1.Install and configure a virtual machine (e.g., using VirtualBox or VMware) with a Linux distribution of your choice.

- **Choose Language**: Select the language for the installation.
- **Keyboard Layout**: Choose the keyboard layout (usually "English (US)" works).
- **Installation Type**: Choose the default installation options. For a simple setup, select "Erase disk and install Ubuntu" (don't worry, this will only affect the virtual hard disk, not your actual physical disk).
- **Set User Info**: Enter your name, desired username, and password.
- **Wait for Installation**: The installation will proceed. This may take a few minutes.
- **Finish Installation**: Once completed, you'll be asked to reboot the VM. Make sure to remove the ISO file from the virtual CD drive to avoid booting into the installer again.

Download a Linux ISO:

- Go to the **Ubuntu website**: Ubuntu Downloads and download an ISO image (e.g., ubuntu-20.04.3-desktop-amd64.iso).

Mount the ISO to the VM:

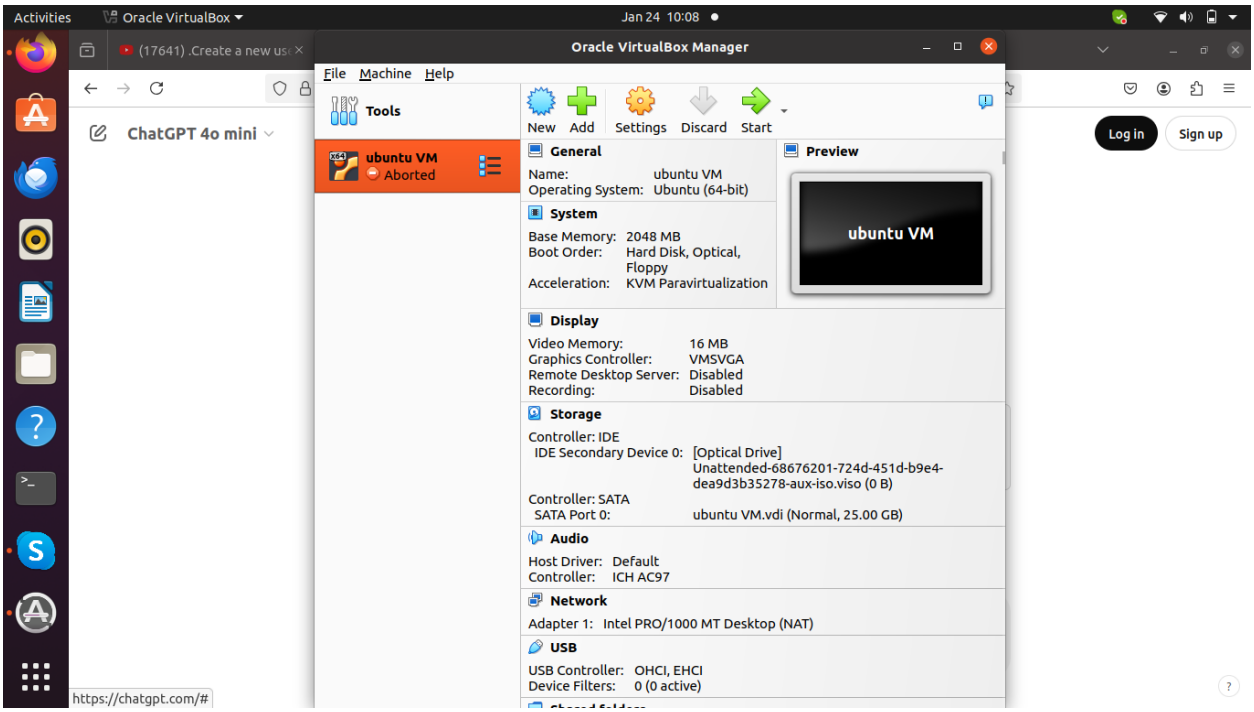
- Select your new virtual machine in the VirtualBox window and click **Settings**.
- Go to **Storage** in the left sidebar.
- Under **Controller: IDE**, click on **Empty** and then click the disk icon on the right side.
- Choose **Choose a disk file** and select the ISO file you downloaded (e.g., ubuntu-20.04.3-desktop-amd64.iso).
- Click **OK** to save the settings.
- **Create a New Virtual Machine**:
- Click **New** at the top left of the VirtualBox window.
- Choose a name for your virtual machine (e.g., "Ubuntu_VM").
- Select the type of OS and version. For example, for Ubuntu, select **Linux** and **Ubuntu (64-bit)**.
- Click **Next**.
- **Allocate Memory (RAM)**:
- Decide how much RAM you want to allocate to the VM. For Ubuntu, it's recommended to allocate at least **2 GB** (2048 MB) of RAM.
- Click **Next**.

Create a Virtual Hard Disk:

- Select **Create a virtual hard disk now** and click **Create**.
- Choose the disk file type (default is **VDI**).
- Select **Dynamically allocated** (this allows the virtual disk to grow in size as needed).
- Set the size of the virtual hard disk. **20 GB** should be enough for most Linux installations.
- Click **Create**.

Start the Virtual Machine:

- Click **Start** at the top of the VirtualBox window to boot the virtual machine.
- The VM will boot from the ISO file and begin the installation process.



2.Create a user named vmuser and enable SSH access to the virtual machine.

Create the User

Run the following command to create the user vmuser:

sudo adduser vmuser

You will be prompted to:

- Set a password for the user.
- Provide optional information (e.g., full name). You can press **Enter** to skip these fields.

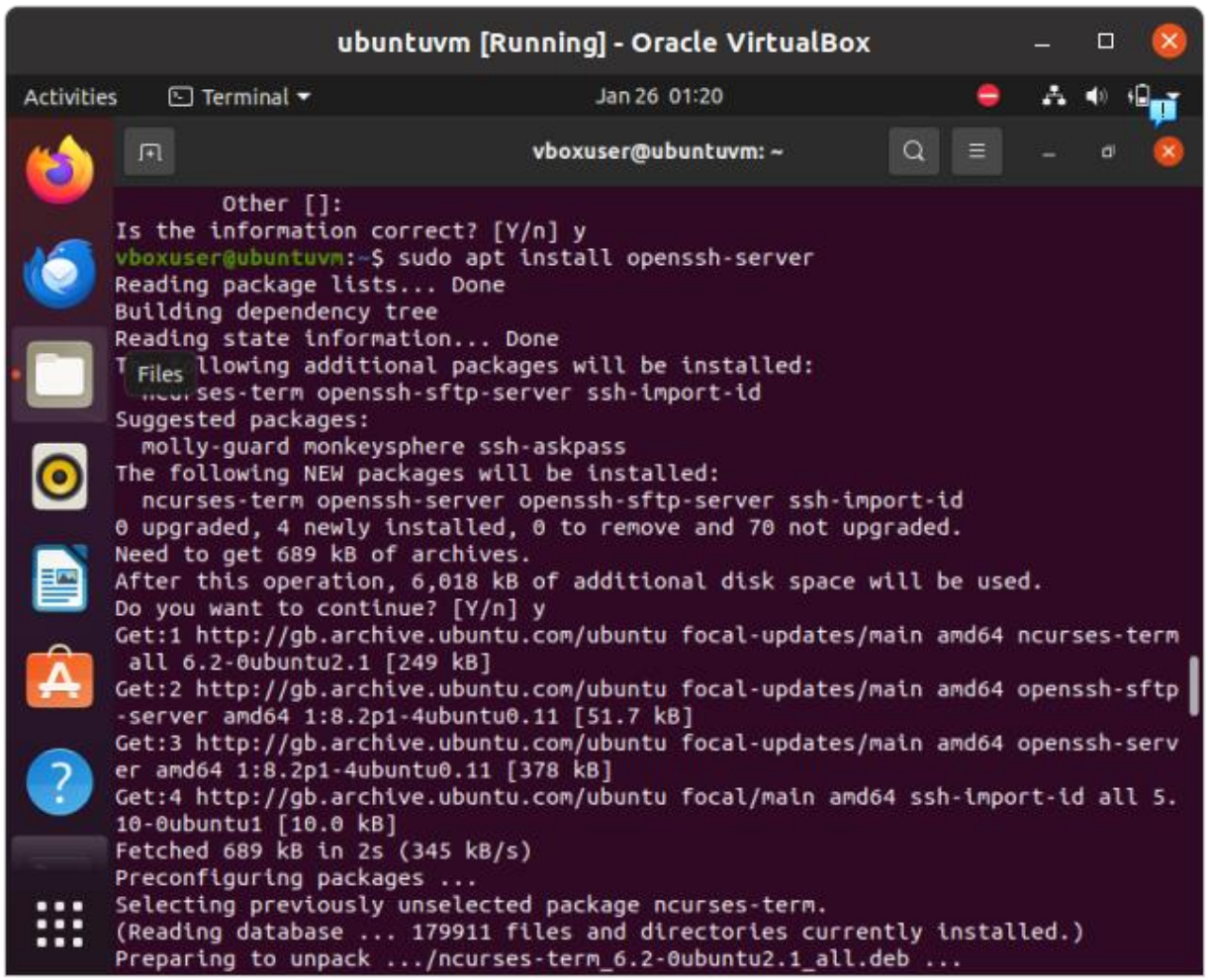
Ensure the SSH server is installed and running:

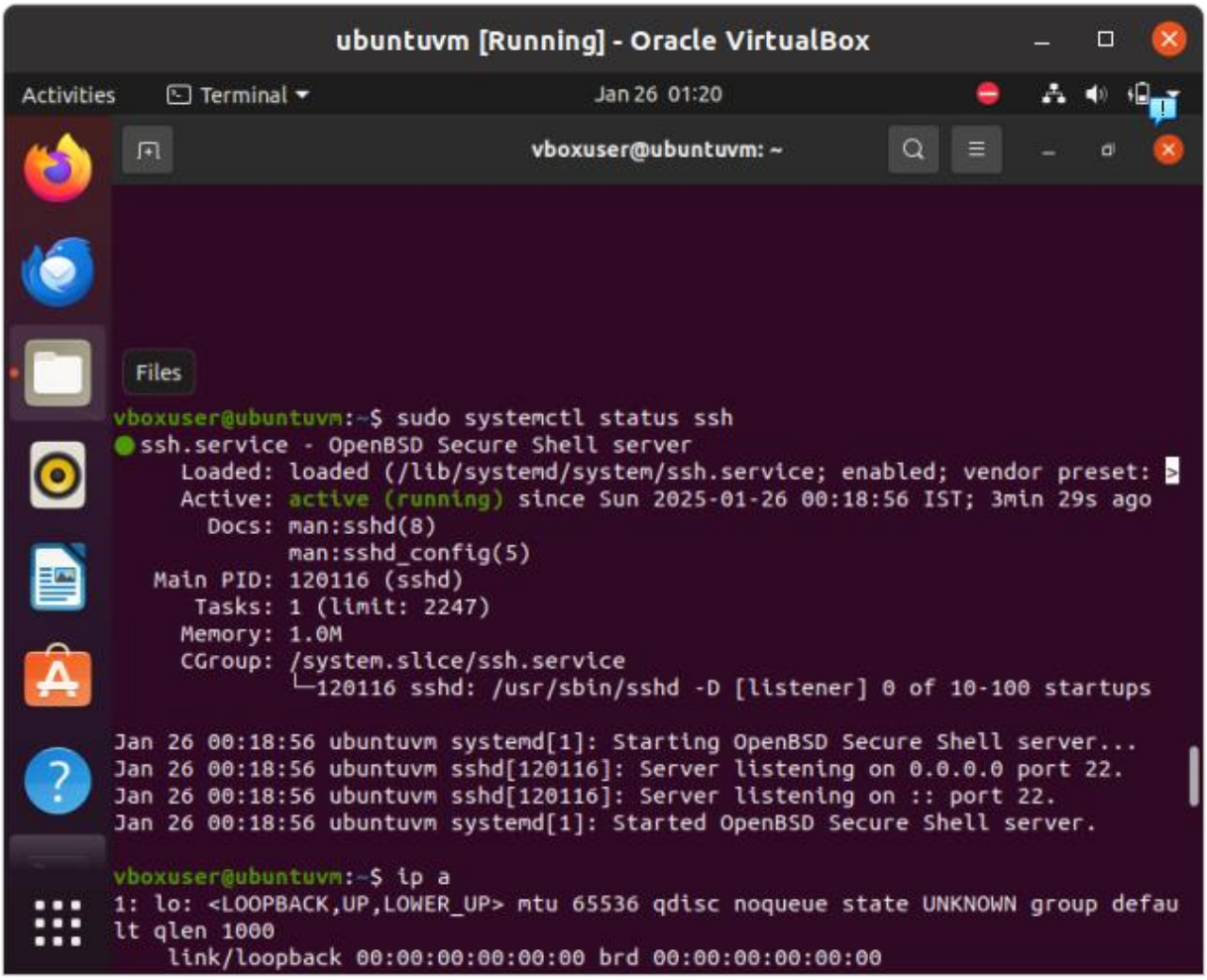
sudo apt update

sudo apt install openssh-server

sudo systemctl enable ssh

sudo systemctl start ssh





3.From your host machine, connect to the virtual machine via SSH using the vmuser credentials.

To connect to the **virtual machine (VM)** from your **host machine** via SSH using the vmuser credentials, you will use the ssh command.

I)SSH Setup in VirtualBox:

Before connecting, ensure that the virtual machine is set up for SSH access.

The VM has SSH server running: Ensure that the ssh server is installed and running on the VM. On the VM, you can check if SSH is running with the following command:

sudo systemctl status ssh

If it's not installed, you can install it:

sudo apt update

sudo apt install openssh-server

Port forwarding (if using NAT): If your VM uses NAT (Network Address Translation), you need to set up **port forwarding** in VirtualBox to forward a specific port (e.g., 2222) from the host machine to the VM.

Steps to configure port forwarding in VirtualBox:

- Open **VirtualBox**.
- Select your **VM** and click on **Settings**.
- Go to **Network** > **Adapter 1** > **Advanced** > **Port Forwarding**.
- Add a new rule for SSH:
    - Name: SSH
    - Protocol: TCP
    - Host Port: 2222 (or any available port on the host)
    - Guest IP: Leave this blank (it should default to 10.0.2.15).
    - Guest Port: 22 (default SSH port on the VM).

SSH Command to Connect from Host Machine

Once your VM is ready and SSH is enabled, you can connect from your **host machine** using the ssh command.

The syntax for the ssh command is:

ssh vmuser@<VM_IP> -p <Port>

- vmuser: The username you want to use to log in to the VM.
- <VM_IP>: The IP address of the VM. If using **NAT** (default in VirtualBox), the IP address will typically be localhost or 127.0.0.1 (for loopback) on the host machine, and you will need to use the forwarded port.
- -p <Port>: The port number that the SSH service is listening on (default is 22, but in case of NAT and port forwarding, use the forwarded port like 2222).

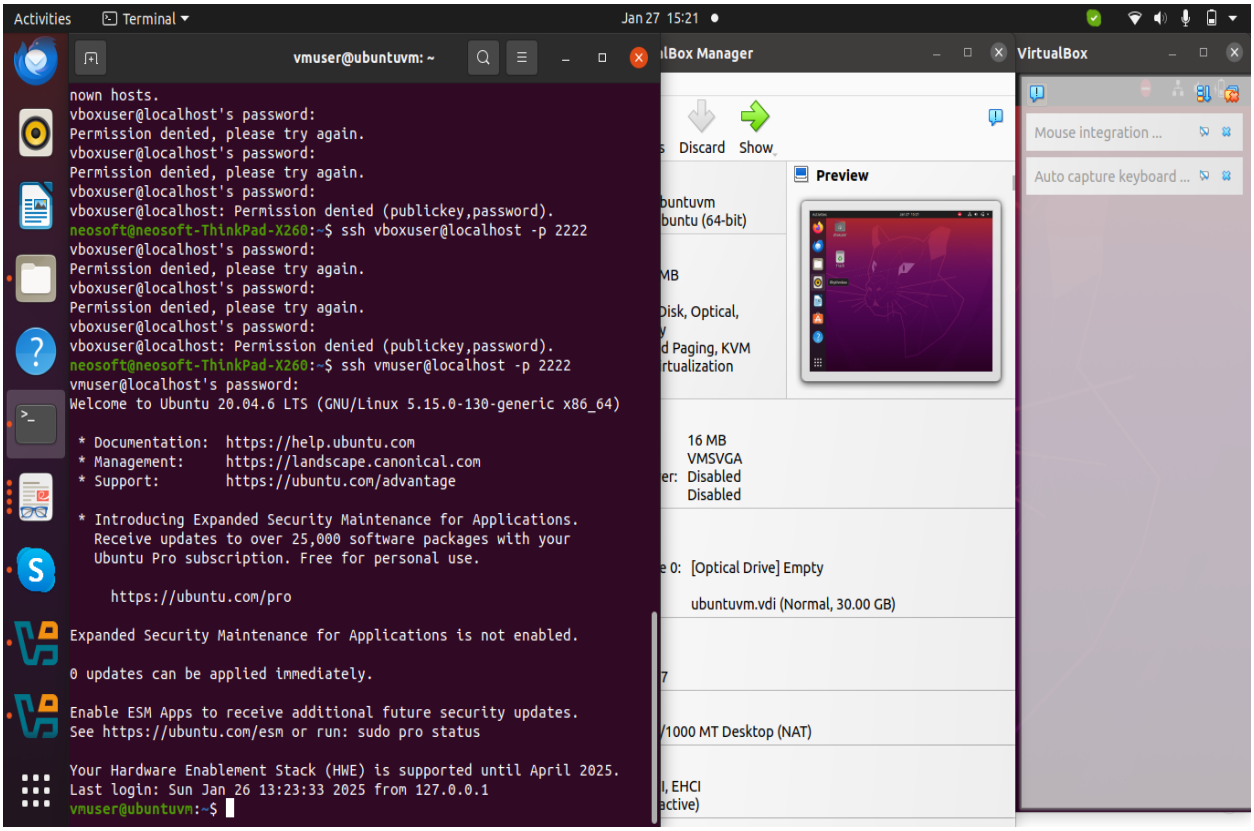
Example for SSH connection:

- If you're using port forwarding (as shown above with port 2222):

ssh vmuser@localhost -p 2222

This command means:

- **vmuser** is the user you're logging in as on the VM.
- **localhost** refers to the host machine, but VirtualBox forwards port 2222 to the VM.
- **-p 2222** specifies the forwarded port for SSH.



4.Transfer a file from your host machine to the virtual machine using scp.

To transfer a file from your **host machine** to your **virtual machine (VM)** using scp (Secure Copy Protocol)

1. Using NAT (Port Forwarding)

If you're using NAT networking with port forwarding (where the VM's IP is something like 10.0.2.15), you can use the following method.

Step 1: Set Up Port Forwarding (if not already done)

1. Open **VirtualBox** and select your VM.
2. Go to **Settings > Network > Adapter 1 > Advanced > Port Forwarding**.
3. Add a rule to forward port 22 on the host to port 22 on the guest:
    a. **Name**: SSH
    b. **Protocol**: TCP
    c. **Host Port**: 2222
    d. **Guest Port**: 22

Step 2: Transfer the File Using scp

On your **host machine**, use scp to copy the file to the VM:

Syntax:

scp -P 2222 /path/to/local/file vboxuser@localhost:/path/to/remote/directory

- Replace /path/to/local/file with the path of the file on the host machine.
- Replace vboxuser with your VM's username.
- Replace /path/to/remote/directory with the destination directory on the VM.

Example

Assuming you want to copy a file called example.txt from your host machine to the /home/vboxuser/ directory on your VM:

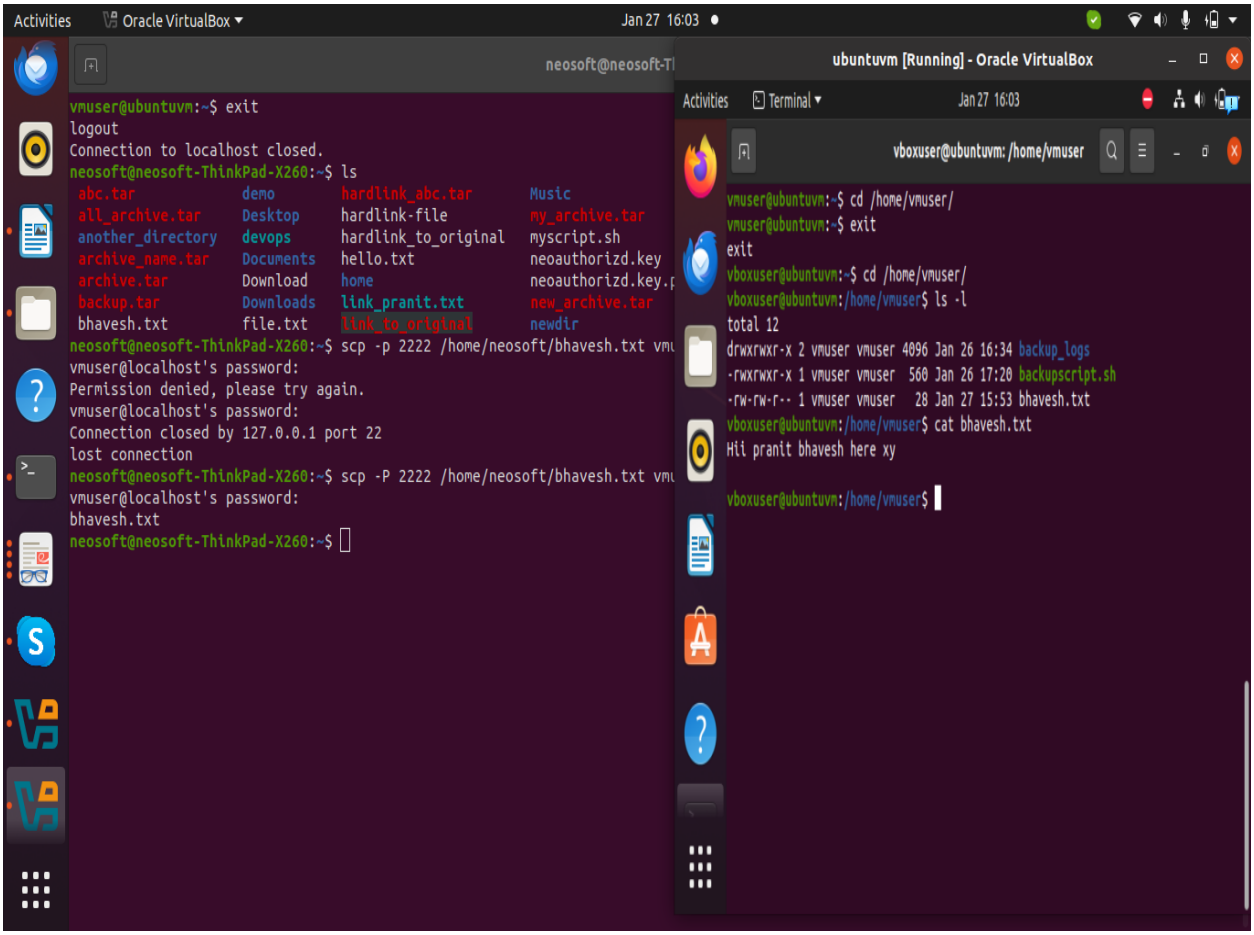
- **For NAT with Port Forwarding**:

scp -P 2222 /home/hostuser/example.txt vboxuser@localhost:/home/vboxuser/

- -P 2222: Specifies the port number (in case you're using port forwarding on NAT).
- /home/hostuser/example.txt: Path of the file on your host machine that you want to transfer.
- vboxuser@localhost: SSH connection to the VM using the forwarded port (localhost because the port is forwarded to localhost on the host).
- /home/vboxuser/: Destination directory on the VM.

Important:

- You'll need to replace hostuser with your actual username on the host machine and vboxuser with your actual username on the VM.
- You'll be prompted to enter the password for the vboxuser account on the VM.



5.Verify the file transfer and set proper permissions for the file on the virtual machine.

To verify the file transfer and set proper permissions for the file on the **Virtual Machine (VM)**, follow these steps:

Verify the File Transfer

Once you're logged into the VM, confirm the file is present in the directory you intended to transfer it to (/home/vmuser/):

1. **Log into the VM**: Run this on your **host machine**:

ssh vmuser@localhost -p 2222

Navigate to the target directory:

cd /home/vmuser/

List the files in the directory to ensure bhavesh.txt is there:

ls -l

You should see something like this:

-rw-r--r-- 1 vmuser vmuser 1234 Jan 27 15:00 bhavesh.txt

rw-r--r-- means:

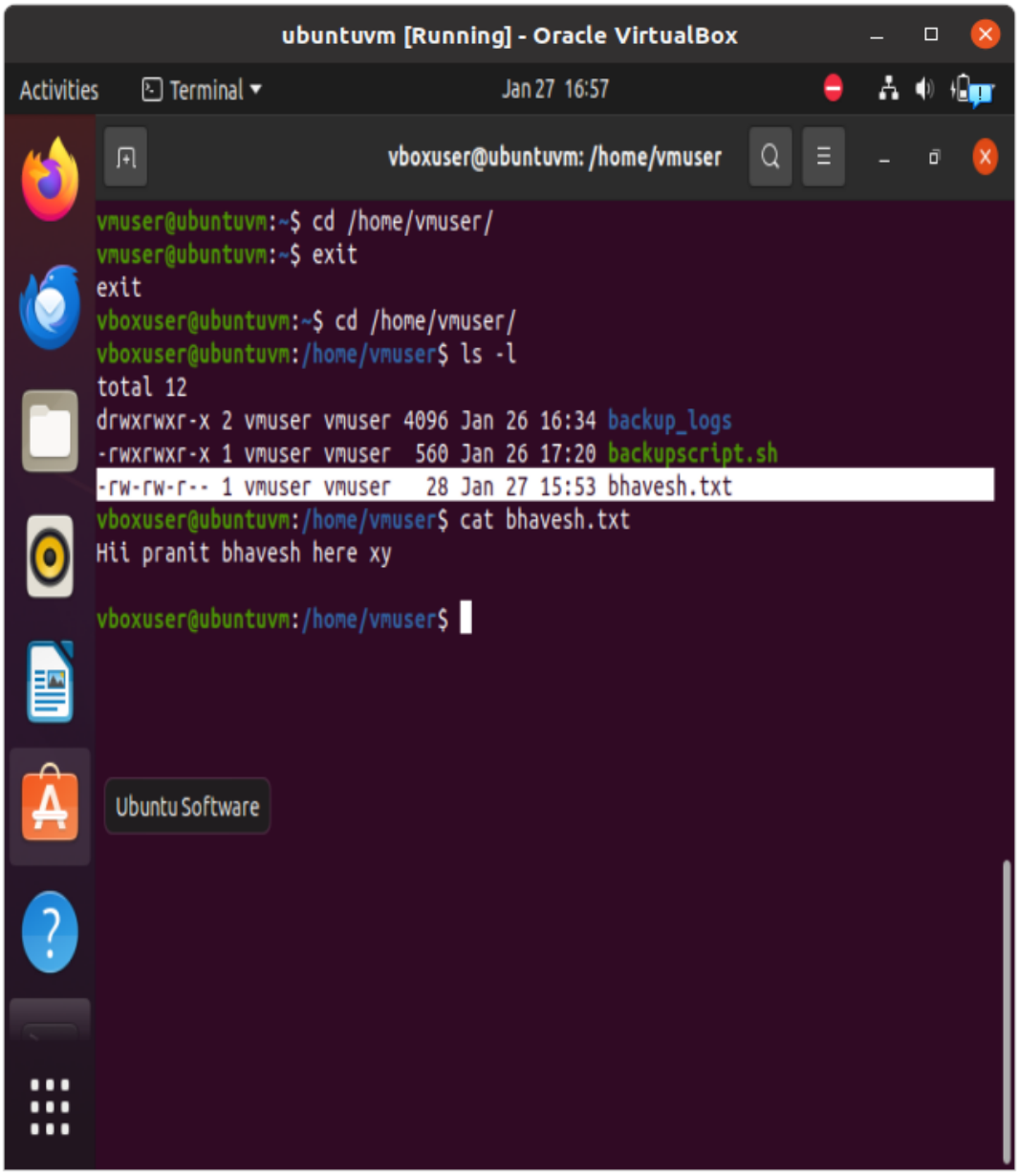
- The owner (vmuser) has **read** and **write** permissions.
- The group (vmuser) and others have **read** permissions.

If you want to make the file **read-only** for others, you can set permissions like this:

chmod 644 bhavesh.txt

This gives:

- **Owner**: read and write (rw-)
- **Group** and **Others**: read only (r--)


ubuntuvm [Running] - Oracle VirtualBox
Activities
Terminal
Jan 27 16:57
vboxuser@ubuntuvm: /home/vmuser
vmuser@ubuntuvm:~$ cd /home/vmuser/
vmuser@ubuntuvm:~$ exit
exit
vboxuser@ubuntuvm:~$ cd /home/vmuser/
vboxuser@ubuntuvm:/home/vmuser$ ls -l
total 12
drwxrwxr-x 2 vmuser vmuser 4096 Jan 26 16:34 backup_logs
-rwxrwxr-x 1 vmuser vmuser 560 Jan 26 17:20 backupscript.sh
-rw-rw-r-- 1 vmuser vmuser 28 Jan 27 15:53 bhavesh.txt
vboxuser@ubuntuvm:/home/vmuser$ cat bhavesh.txt
Hii pranit bhavesh here xy
vboxuser@ubuntuvm:/home/vmuser$
Ubuntu Software