



University of Colombo School of Computing

SCS 1301 - Data Structures and Program Design in C

Lab Sheet 01

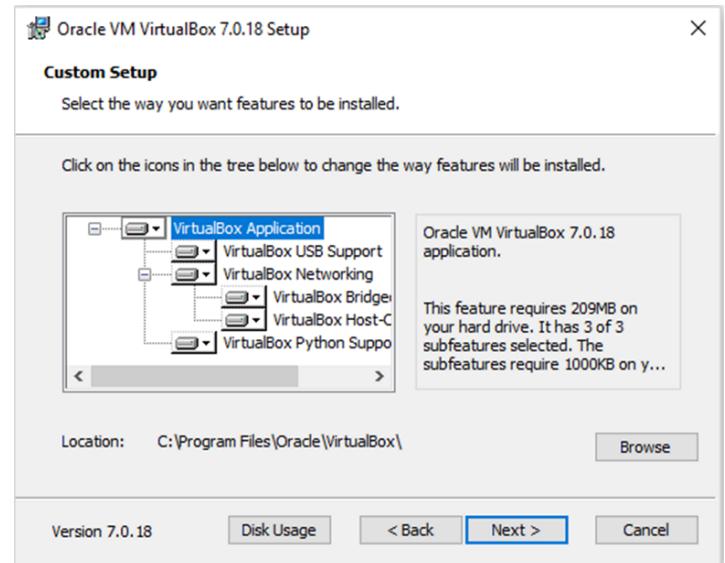
Task No. 1 - Setup Virtual Machine and the Ubuntu Environment

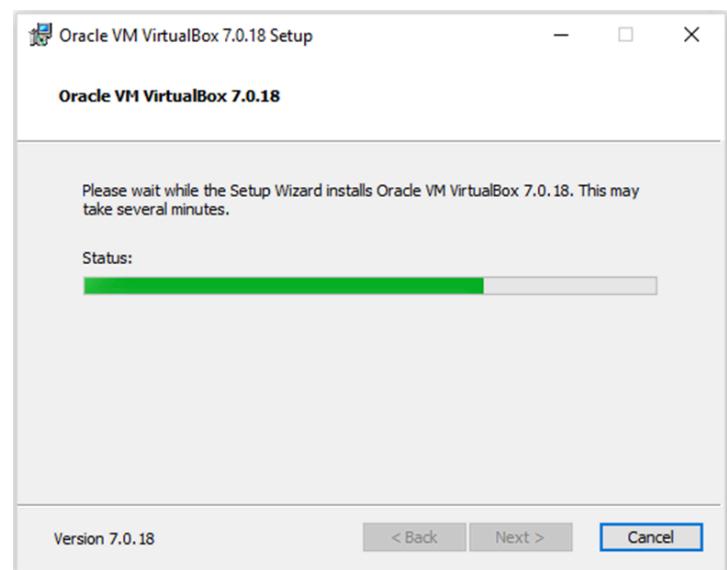
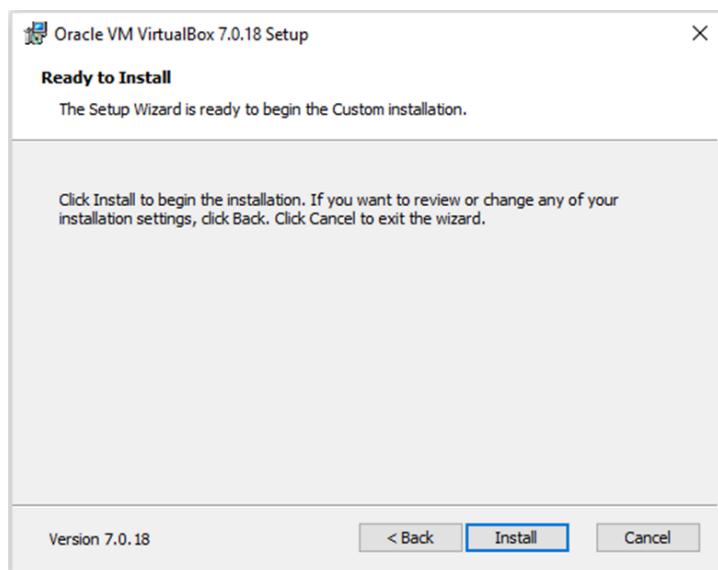
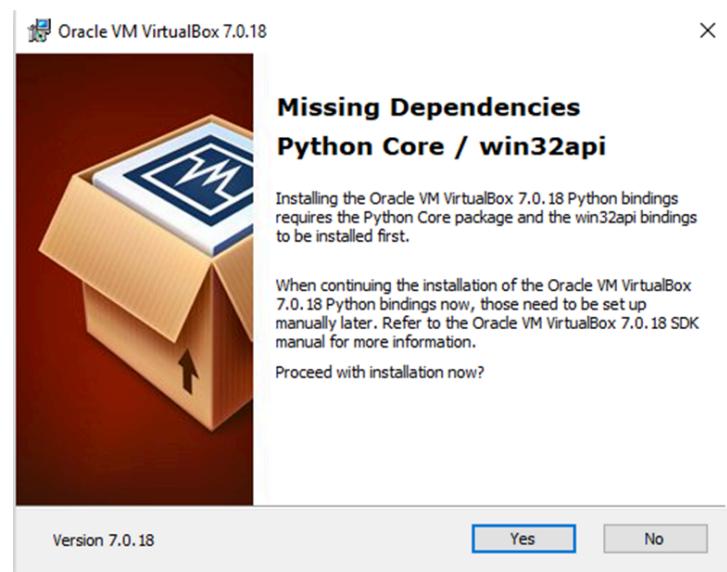
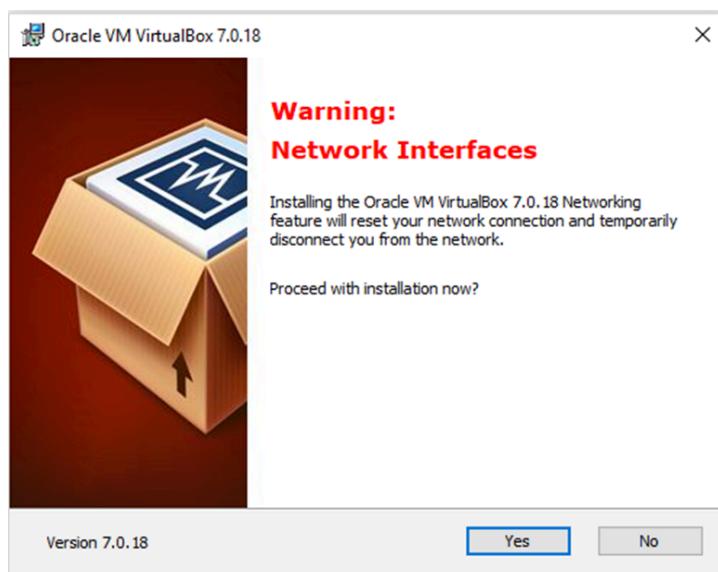
1. Download “Virtual Box” software using the following link.

<https://www.virtualbox.org/wiki/Downloads>

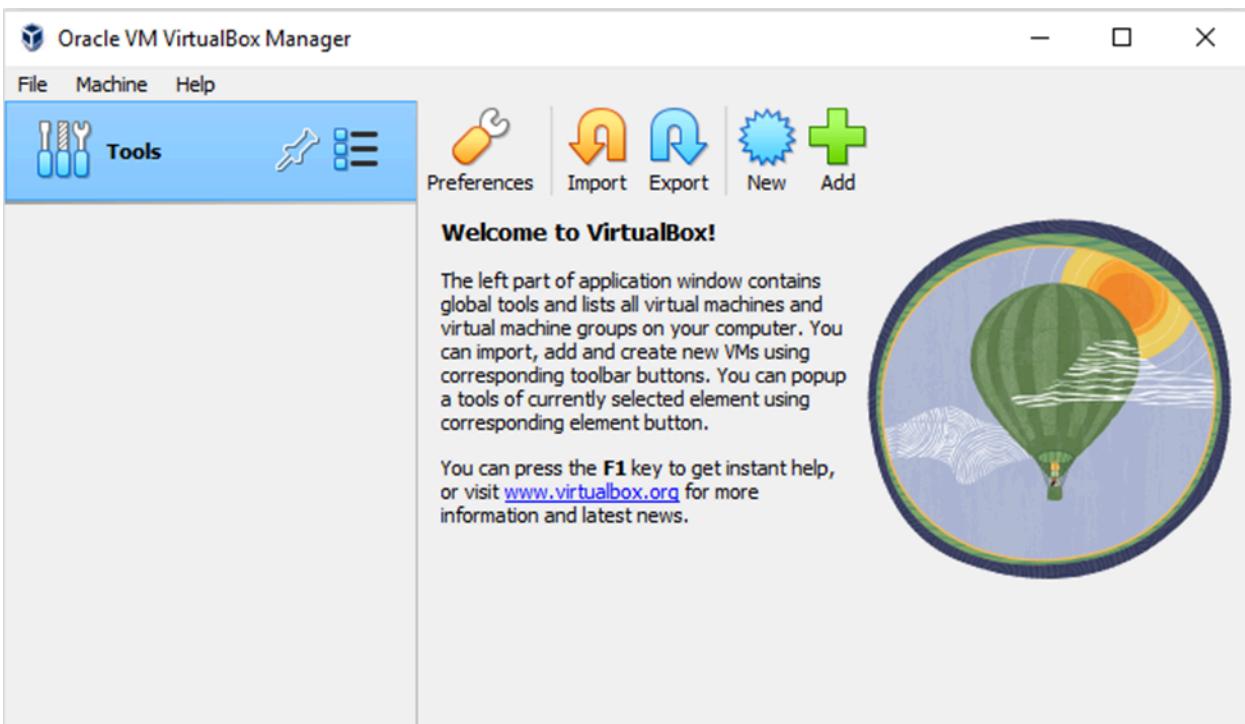
The screenshot shows the Oracle VM VirtualBox 7.0.18 platform packages section. It lists various host operating system options: Windows hosts, macOS / Intel hosts, Linux distributions, Solaris hosts, and Solaris 11 IPS hosts. Below this, it states that the binaries are released under the terms of the GPL version 3 and provides a link to the changelog. A note at the bottom encourages users to compare checksums for integrity verification.

2. Install Virtual box Software as follows.





3. Home page of “Virtual Box”.



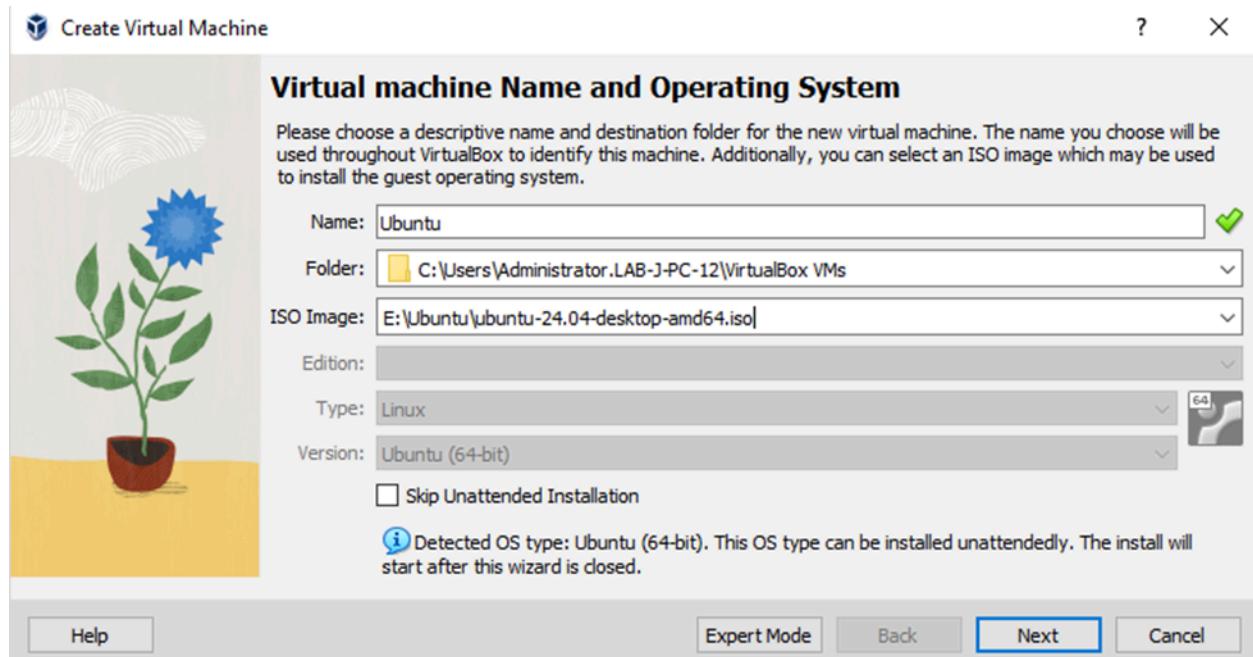
4. Download Ubuntu Operating System with following link

<https://ubuntu.com/download/desktop>

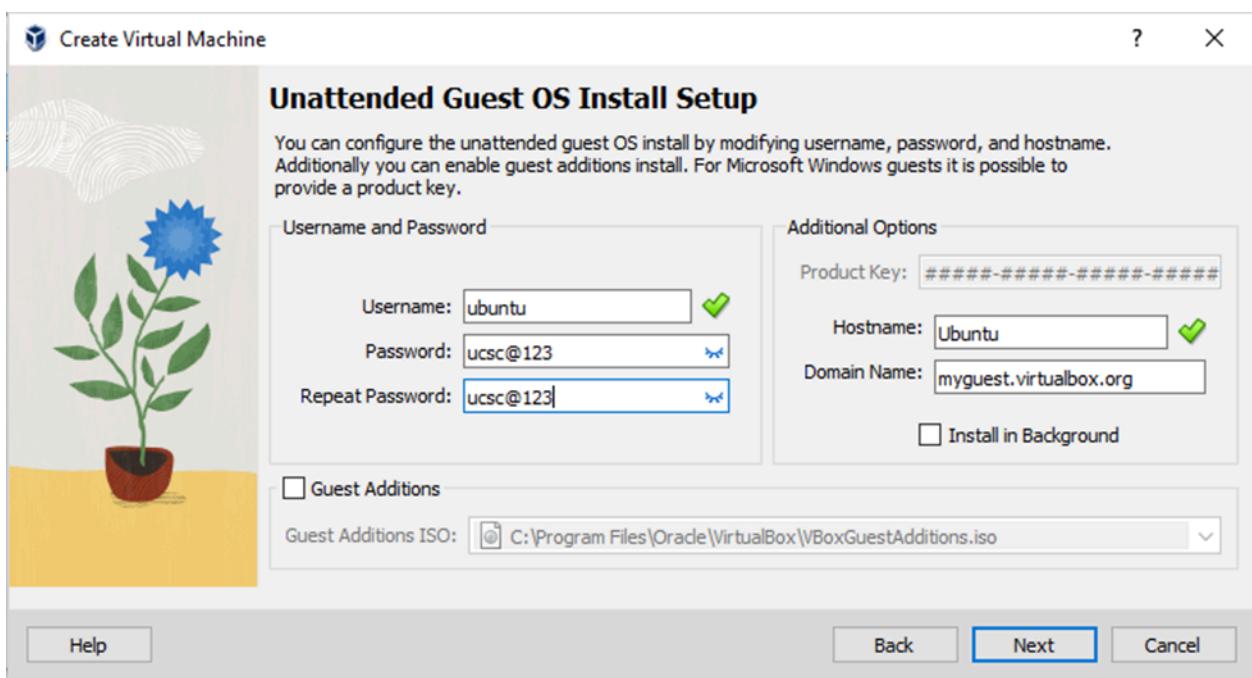
A screenshot of the Canonical Ubuntu download page. The header includes the Canonical logo and a search bar. The main heading is "Download Ubuntu Desktop". To the right, a description states: "The open source desktop operating system that powers millions of PCs and laptops around the world. Find out more about Ubuntu's features and how we support developers and organisations below." Below this are two buttons: "Discover Ubuntu Desktop" and "Check out the blog >". A section for "Ubuntu 24.04 LTS" is shown, with a green "Download 24.04 LTS" button labeled "6GB". To the right of this section is a note: "The latest LTS version of Ubuntu, for desktop PCs and laptops. LTS stands for long-term support — which means five years of free security and maintenance updates, extended to 10 years with Ubuntu Pro." At the bottom, there is a note about other download options and a blue speech bubble icon.

5. Initial Configurations of Virtual Machine.

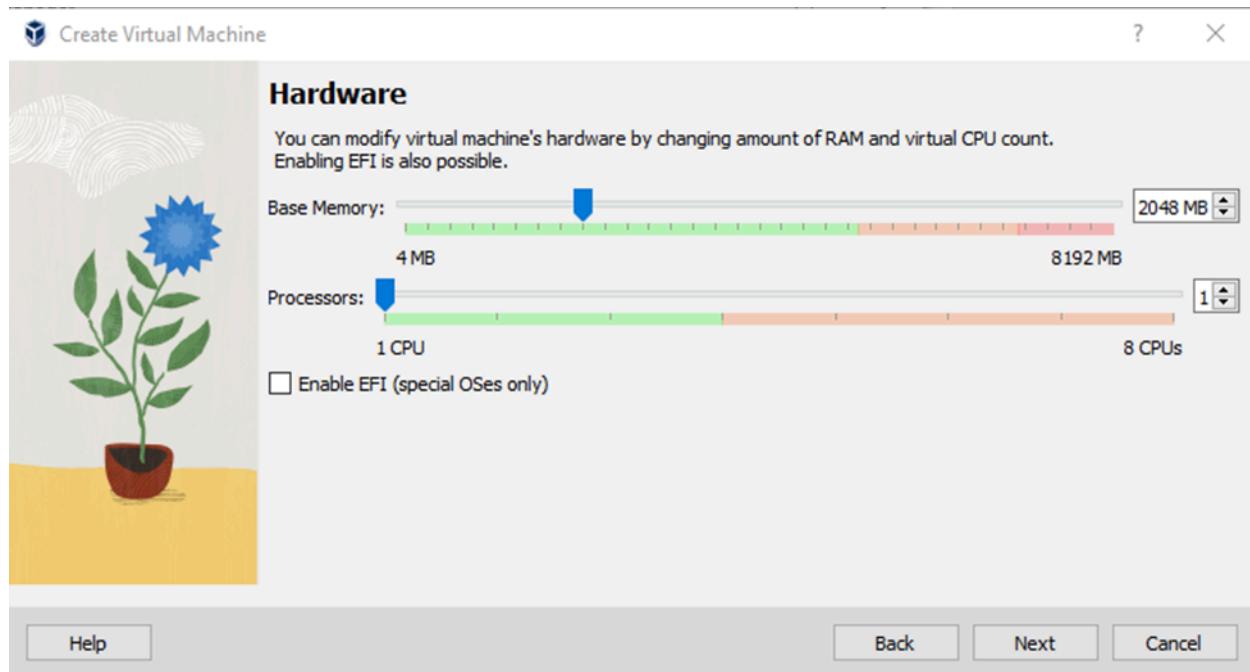
- Set the folder where you need to store the application file.
- ISO Image is the downloaded Ubuntu file path.



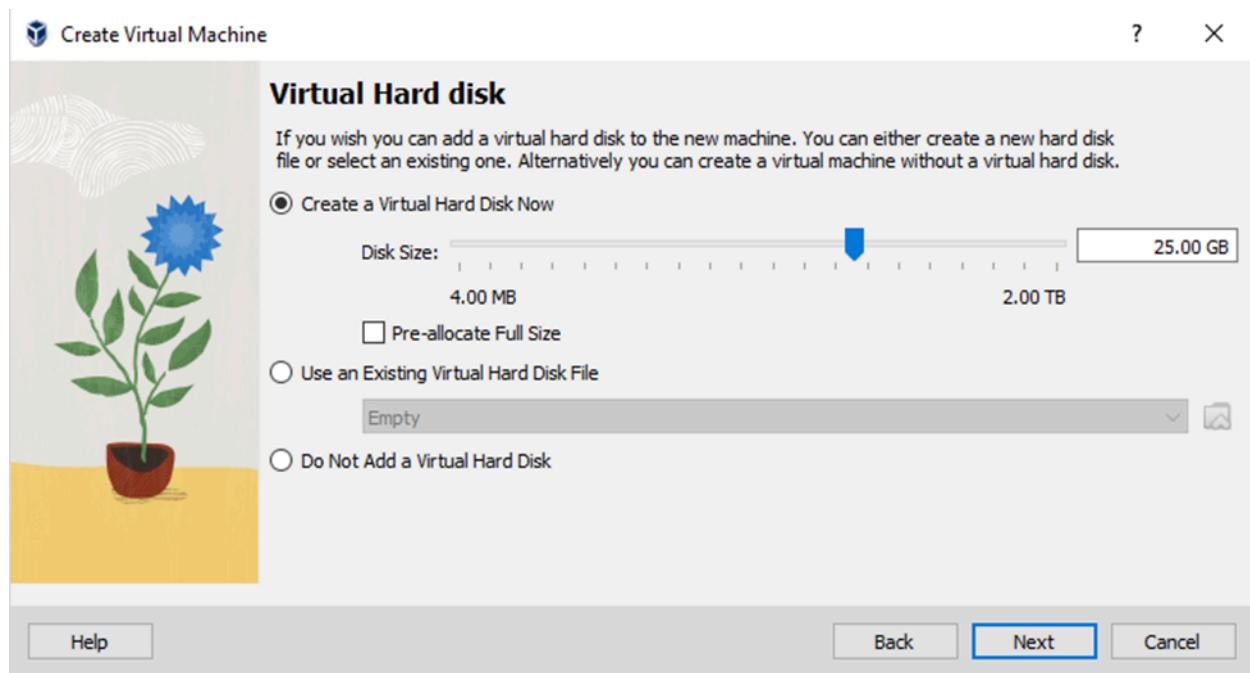
6. Set the unattended guest OS install account details.



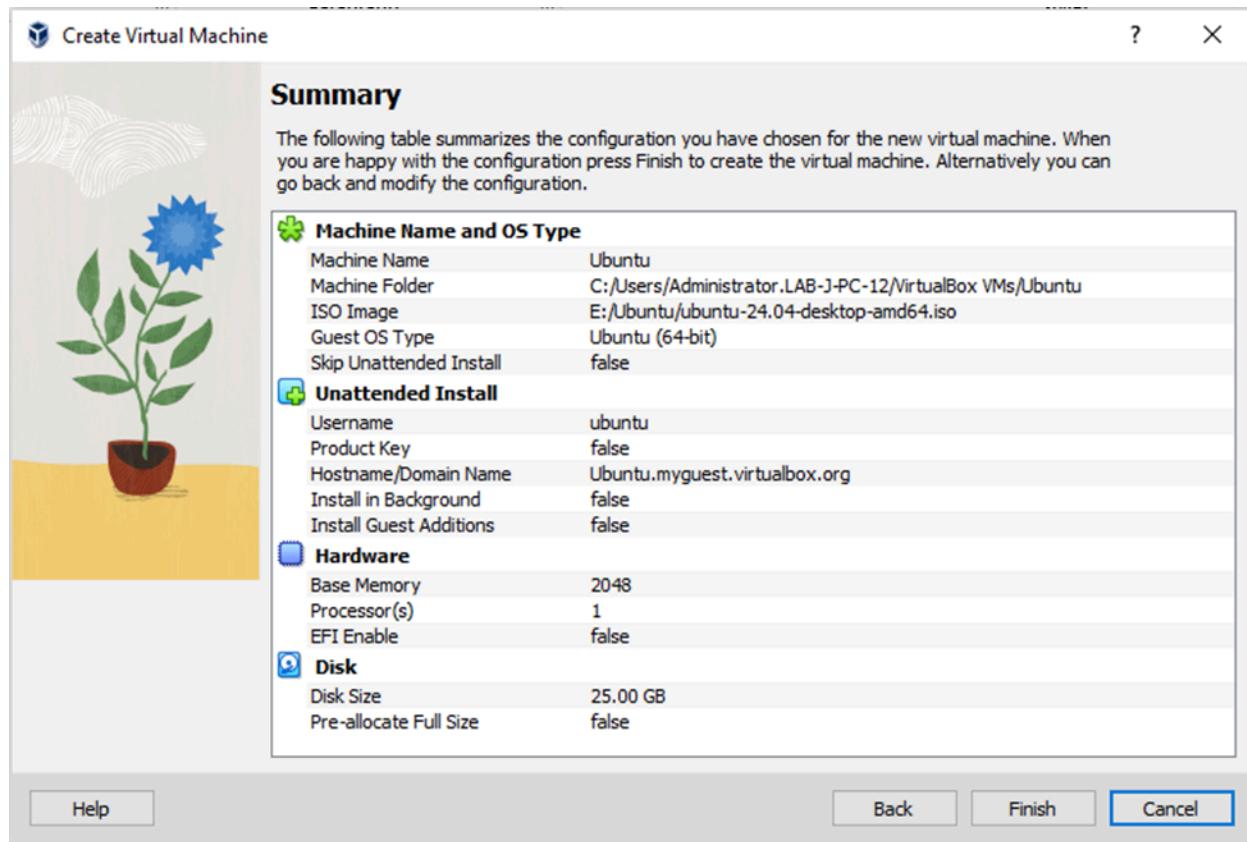
7. Configure the Hardware Specifications. (recommended values are used here.)



8. Allocate the “Hard Disk” features.

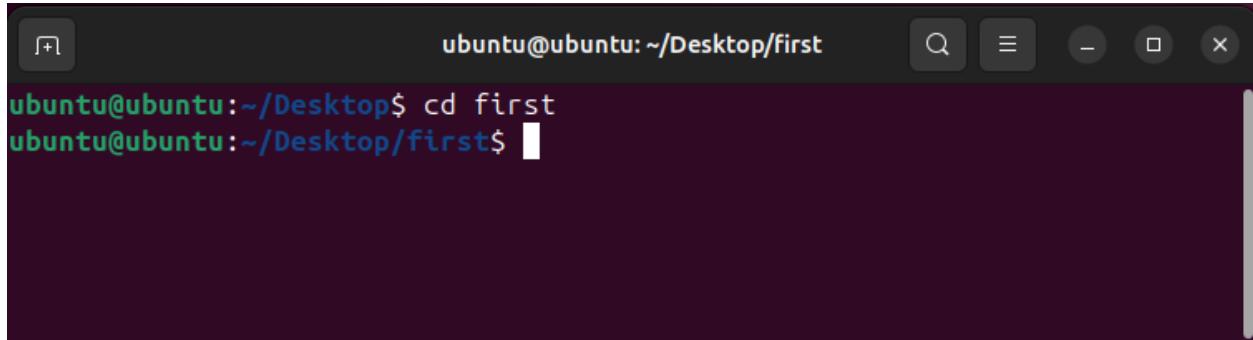


9. Before clicking the Finish button, check whether the specifications are correct.



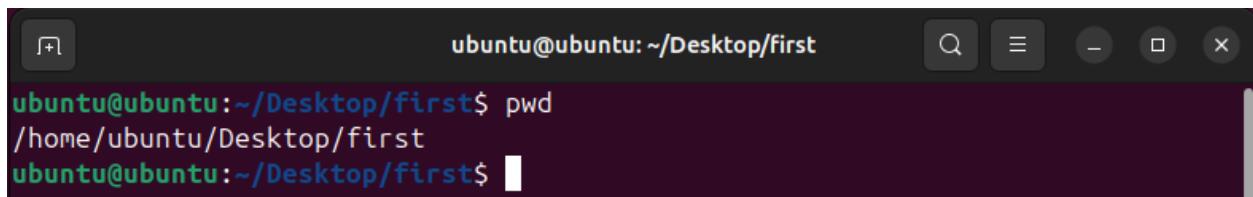
Task No.2 - Basics of Ubuntu

1. **cd** : change or going to specified directory.



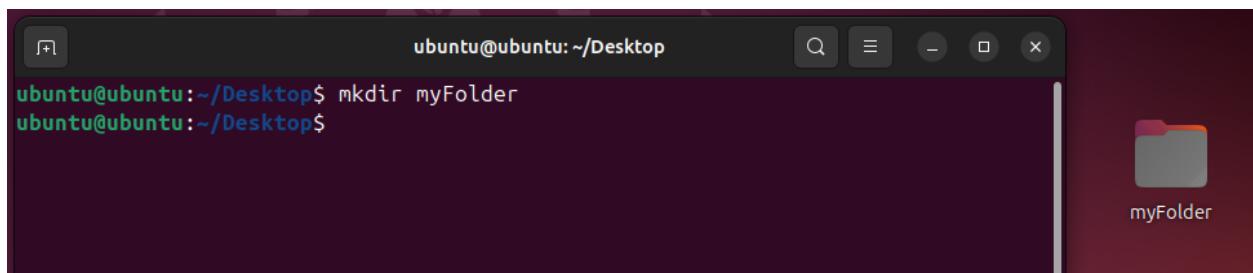
```
ubuntu@ubuntu:~/Desktop$ cd first
ubuntu@ubuntu:~/Desktop/first$
```

2. **pwd** : Search “Present Work Directory”



```
ubuntu@ubuntu:~/Desktop/first$ pwd
/home/ubuntu/Desktop/first
ubuntu@ubuntu:~/Desktop/first$
```

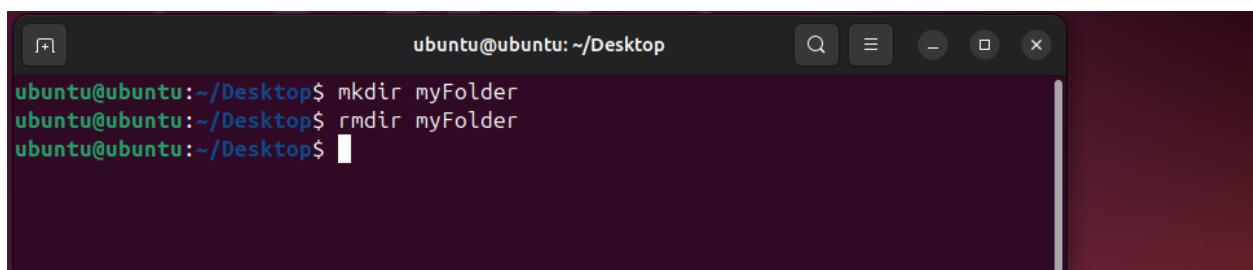
3. **mkdir** : Make a new Directory



```
ubuntu@ubuntu:~/Desktop$ mkdir myFolder
ubuntu@ubuntu:~/Desktop$
```

myFolder

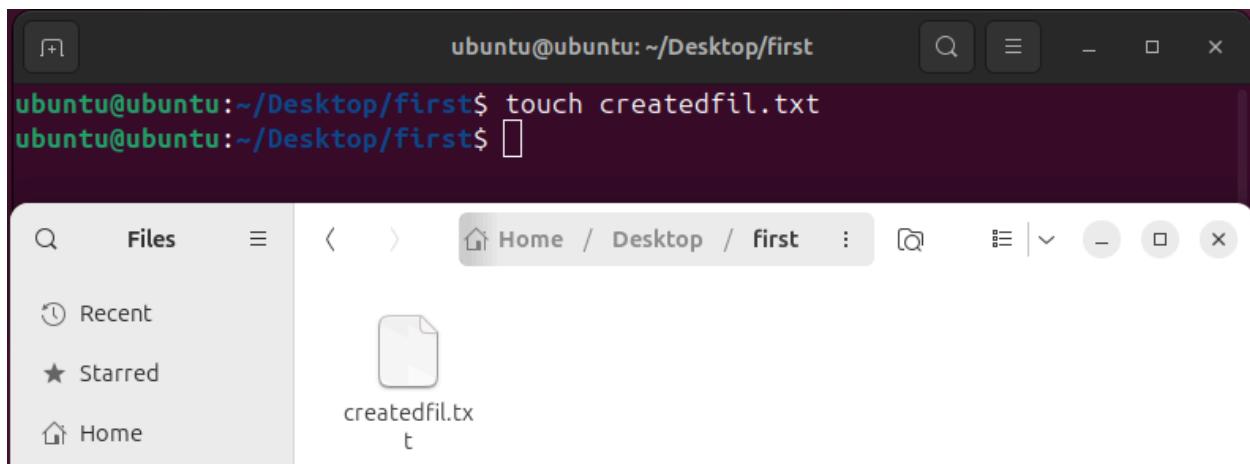
4. **rmdir** : Remove a Directory



```
ubuntu@ubuntu:~/Desktop$ mkdir myFolder
ubuntu@ubuntu:~/Desktop$ rmdir myFolder
ubuntu@ubuntu:~/Desktop$
```

5. **touch** : create an empty file

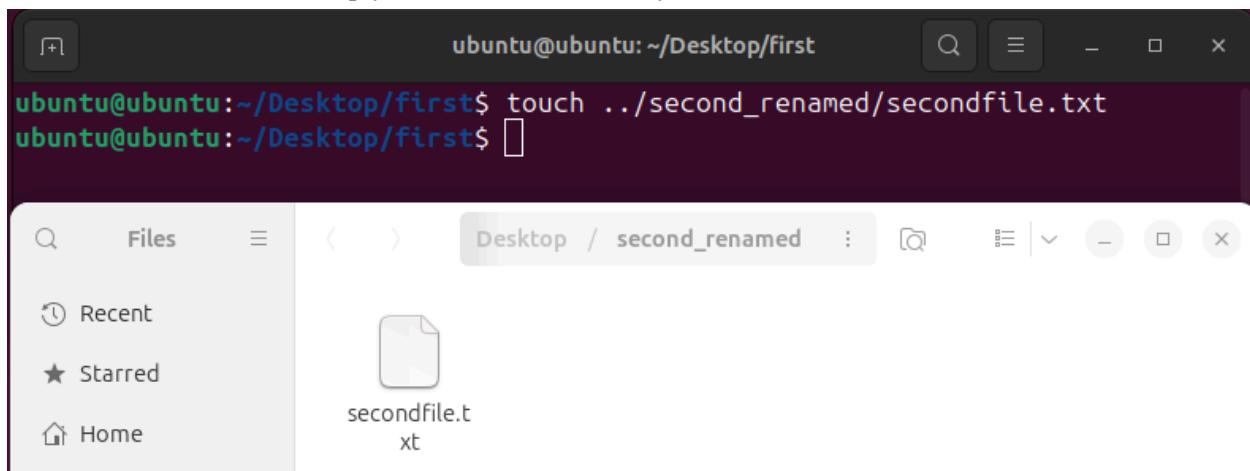
- Create an empty file in the present work directory.



```
ubuntu@ubuntu:~/Desktop/first$ touch createdfil.txt
ubuntu@ubuntu:~/Desktop/first$
```

The file manager window shows the 'first' directory containing a single file named 'createdfil.txt'. The file icon is a white document with a blue outline.

- Create an empty file in another directory.

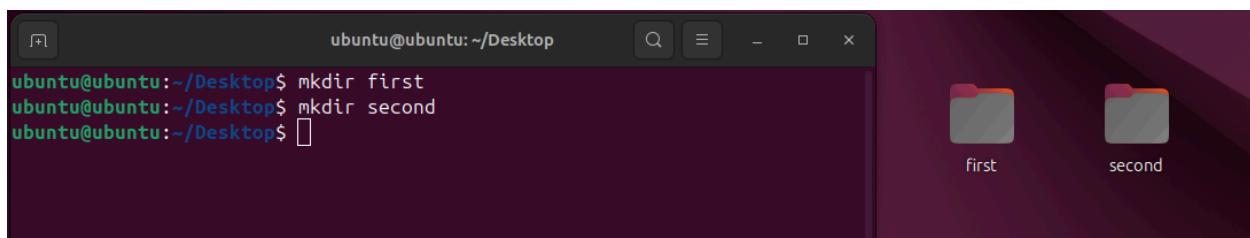


```
ubuntu@ubuntu:~/Desktop/first$ touch ../second_renamed/secondfile.txt
ubuntu@ubuntu:~/Desktop/first$
```

The file manager window shows the 'second_renamed' directory containing a single file named 'secondfile.txt'. The file icon is a white document with a blue outline.

6. **mv** : to move a file to another location or rename it.

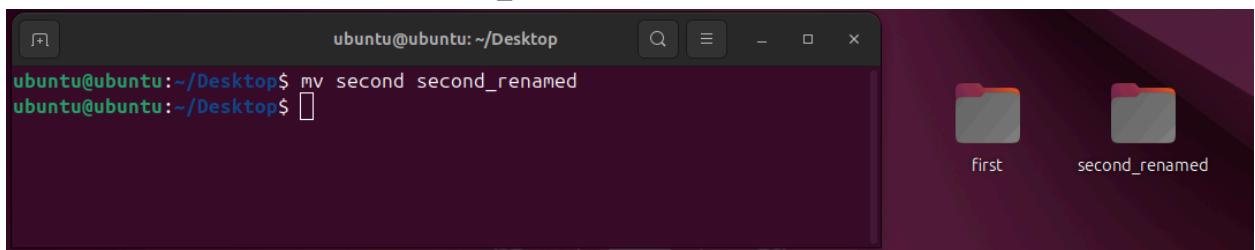
- Make two directories



```
ubuntu@ubuntu:~/Desktop$ mkdir first
ubuntu@ubuntu:~/Desktop$ mkdir second
ubuntu@ubuntu:~/Desktop$
```

The desktop environment shows two new folder icons labeled 'first' and 'second' on the desktop.

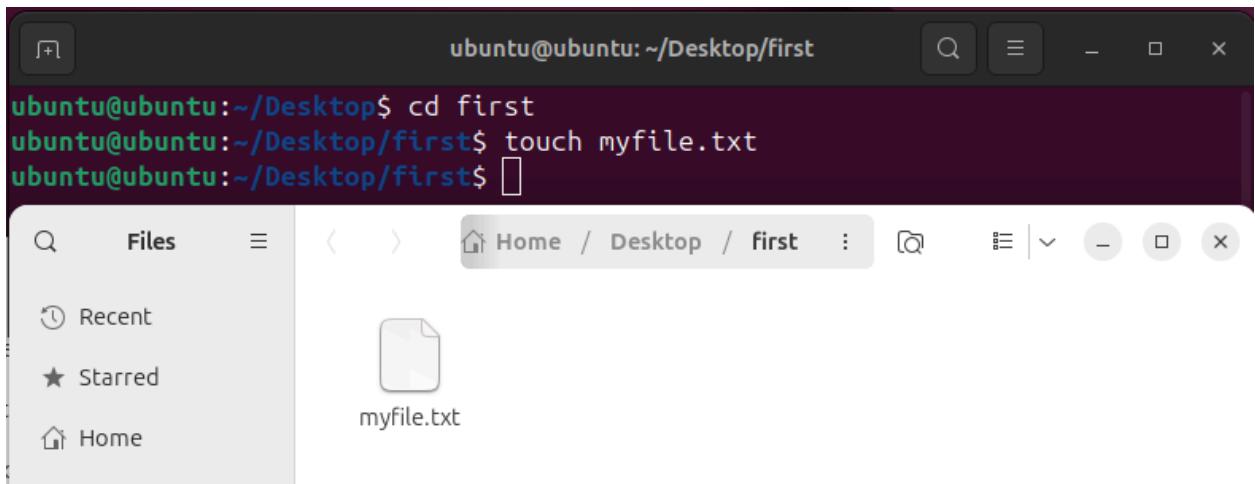
b. Rename second to second_renamed



```
ubuntu@ubuntu:~/Desktop$ mv second second_renamed
ubuntu@ubuntu:~/Desktop$
```

The terminal window shows the command `mv second second_renamed` being run, followed by a blank line. To the right of the terminal is a screenshot of a desktop environment with two folders on the desktop: "first" and "second_renamed".

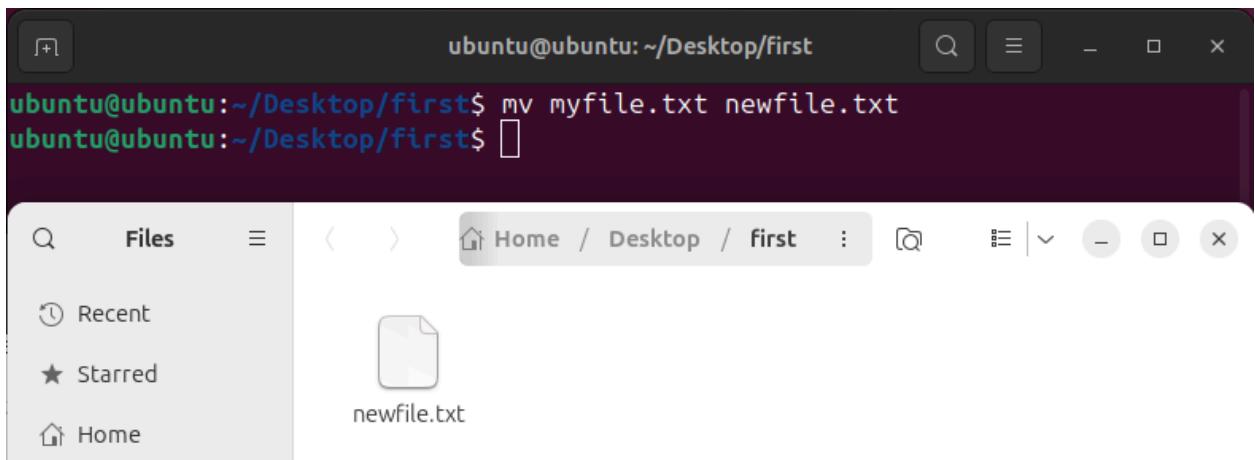
c. Create a file named myfile.txt



```
ubuntu@ubuntu:~/Desktop$ cd first
ubuntu@ubuntu:~/Desktop/first$ touch myfile.txt
ubuntu@ubuntu:~/Desktop/first$
```

The terminal window shows the commands `cd first`, `touch myfile.txt`, and a blank line. To the right of the terminal is a screenshot of a file manager window showing a file named "myfile.txt" in the "first" directory.

d. Rename myfile.txt to newfile.txt

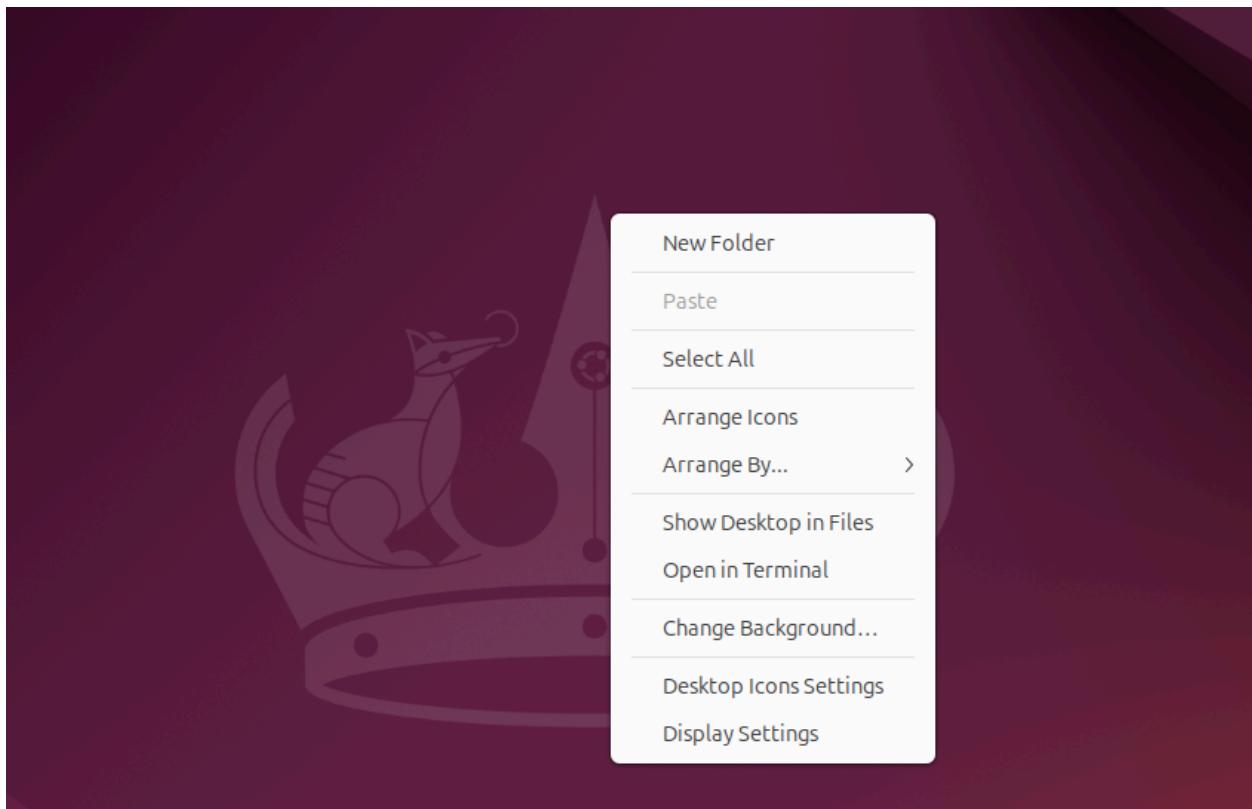


```
ubuntu@ubuntu:~/Desktop/first$ mv myfile.txt newfile.txt
ubuntu@ubuntu:~/Desktop/first$
```

The terminal window shows the command `mv myfile.txt newfile.txt` being run, followed by a blank line. To the right of the terminal is a screenshot of a file manager window showing a file named "newfile.txt" in the "first" directory.

Opening a terminal

Right click on the folder you need to open in terminal and Select “Open in Terminal”.



Practical No.3 - Install VIM Editor

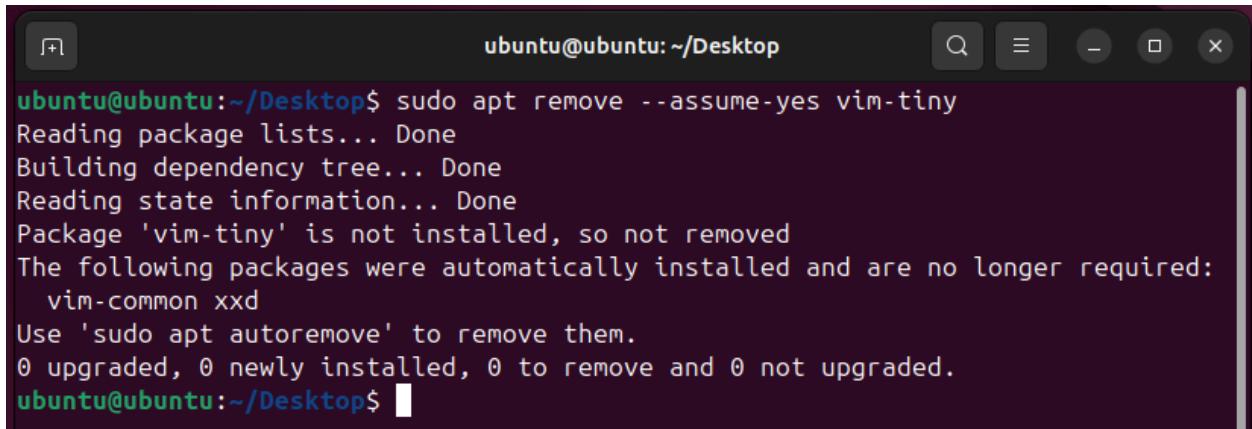
1. Open the Terminal and type the following statement.

“sudo apt install”

A screenshot of a terminal window with a dark theme. The title bar shows the session is running as 'ubuntu@ubuntu: ~/Desktop'. The main area of the terminal displays the command 'sudo apt install' followed by its output. The output indicates that 0 packages were upgraded, 0 were newly installed, 0 were removed, and 0 were not upgraded. The terminal prompt ends with a '\$' sign.

2. Remove the existing vim_tiny using following code,

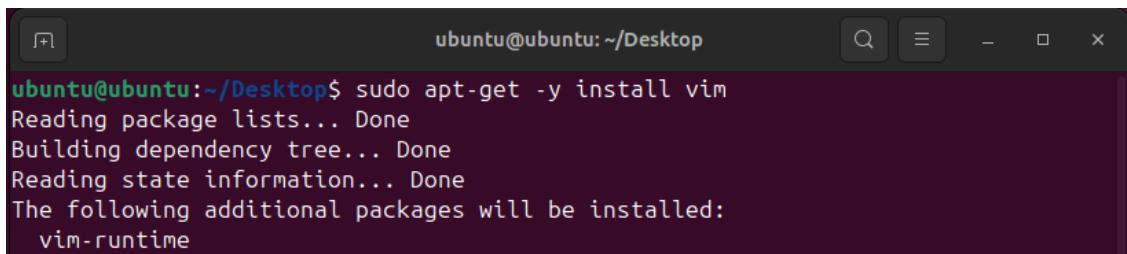
“sudo apt remove --assume-yes vim-tiny”



```
ubuntu@ubuntu:~/Desktop$ sudo apt remove --assume-yes vim-tiny
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Package 'vim-tiny' is not installed, so not removed
The following packages were automatically installed and are no longer required:
  vim-common xxd
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
ubuntu@ubuntu:~/Desktop$
```

3. Install vim by following,

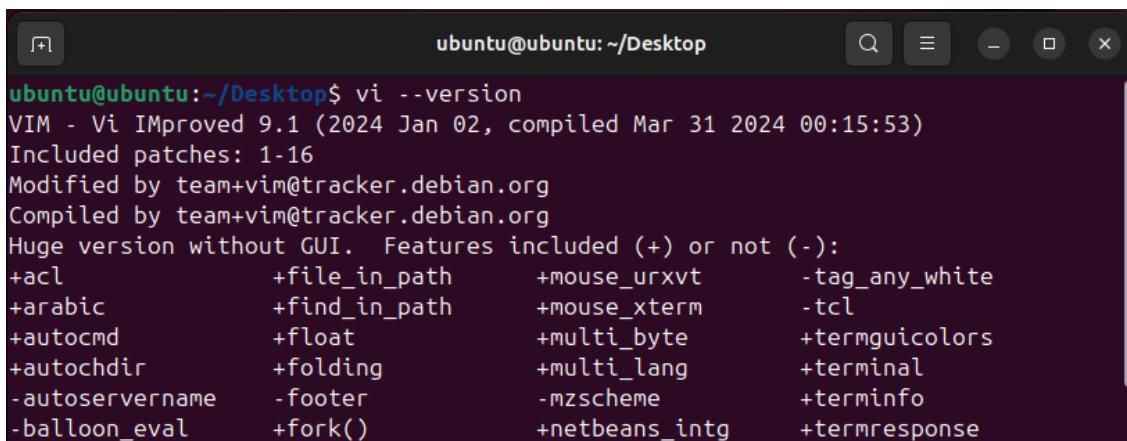
“sudo apt-get -y install vim”



```
ubuntu@ubuntu:~/Desktop$ sudo apt-get -y install vim
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  vim-runtime
```

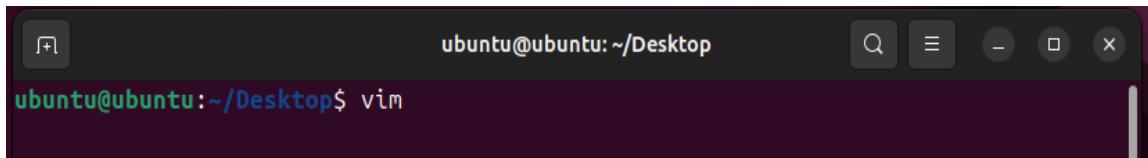
4. Check the vim version from following,

“vi --version”



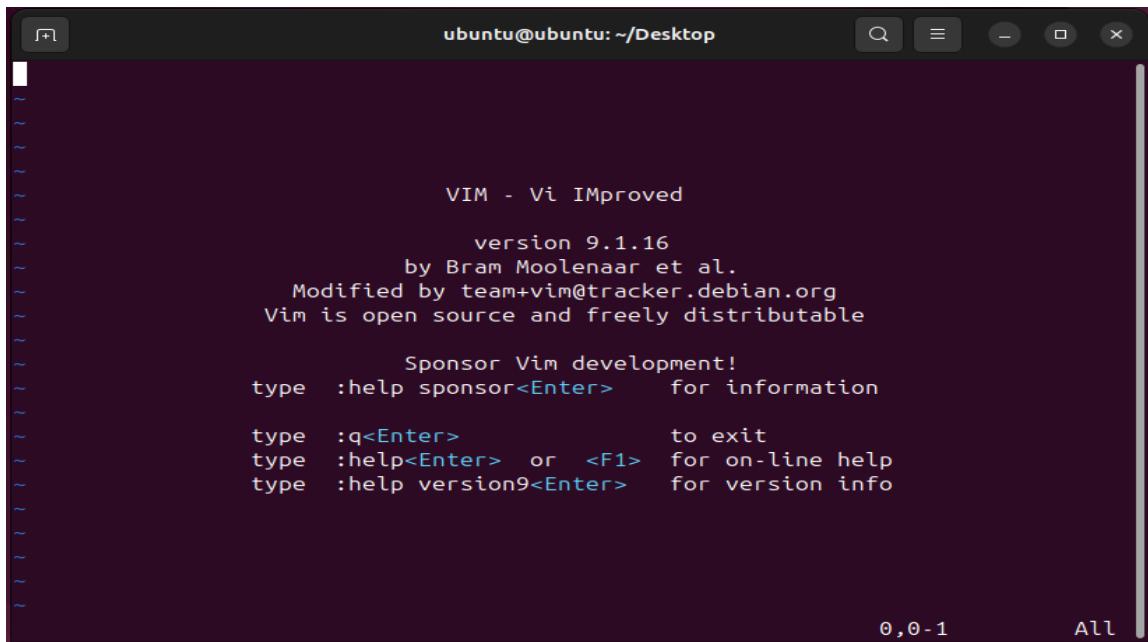
```
ubuntu@ubuntu:~/Desktop$ vi --version
VIM - Vi IMproved 9.1 (2024 Jan 02, compiled Mar 31 2024 00:15:53)
Included patches: 1-16
Modified by team+vim@tracker.debian.org
Compiled by team+vim@tracker.debian.org
Huge version without GUI. Features included (+) or not (-):
+acl          +file_in_path    +mouse_urxvt      -tag_any_white
+arabic       +find_in_path   +mouse_xterm      -tcl
+autocmd      +float         +multi_byte      +termguicolors
+autochdir    +folding        +multi_lang      +terminal
-autoservername -footer        -mzscheme       +terminfo
-balloon_eval +fork()        +netbeans_intg   +termresponse
```

5. Start vim from following,
“vim”



```
ubuntu@ubuntu:~/Desktop$ vim
```

6. Default home for VIM



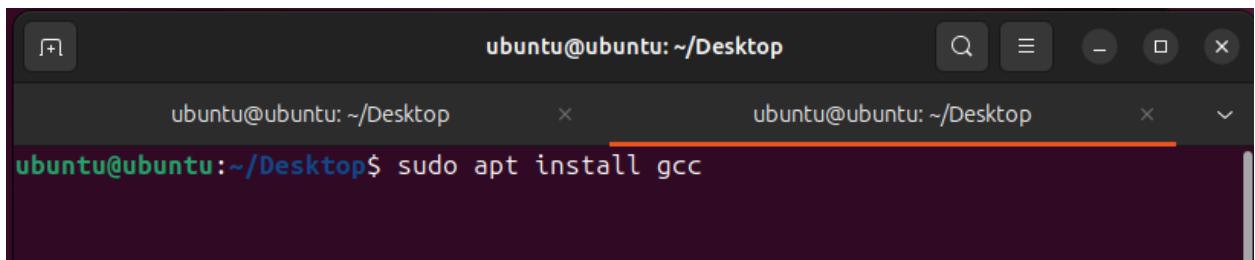
```
VIM - Vi IMproved
version 9.1.16
by Bram Moolenaar et al.
Modified by team+vim@tracker.debian.org
Vim is open source and freely distributable

Sponsor Vim development!
type :help sponsor<Enter> for information

type :q<Enter> to exit
type :help<Enter> or <F1> for on-line help
type :help version9<Enter> for version info
```

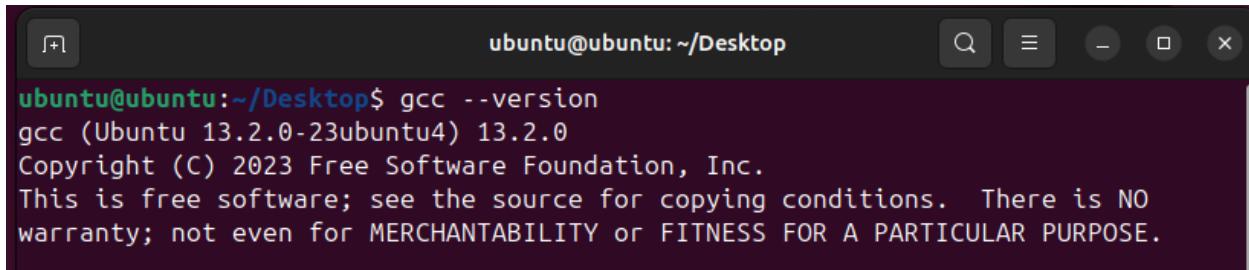
Practical No.4 - Install GCC

1. Install GCC with the following statement.



```
ubuntu@ubuntu:~/Desktop$ sudo apt install gcc
```

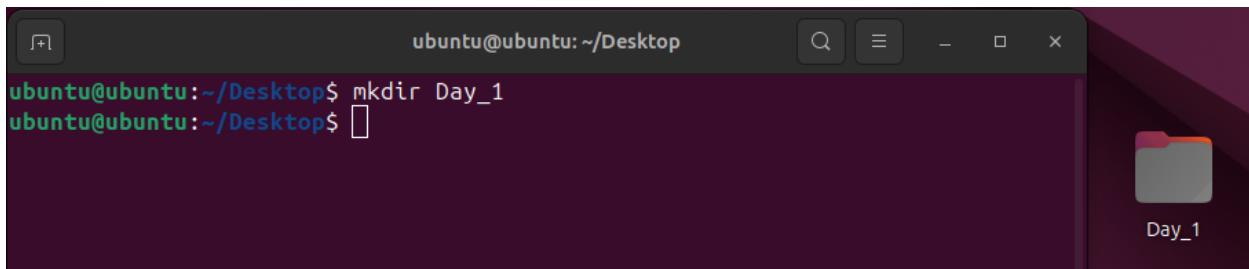
2. Check the GCC version.



```
ubuntu@ubuntu:~/Desktop$ gcc --version
gcc (Ubuntu 13.2.0-23ubuntu4) 13.2.0
Copyright (C) 2023 Free Software Foundation, Inc.
This is free software; see the source for copying conditions. There is NO
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.
```

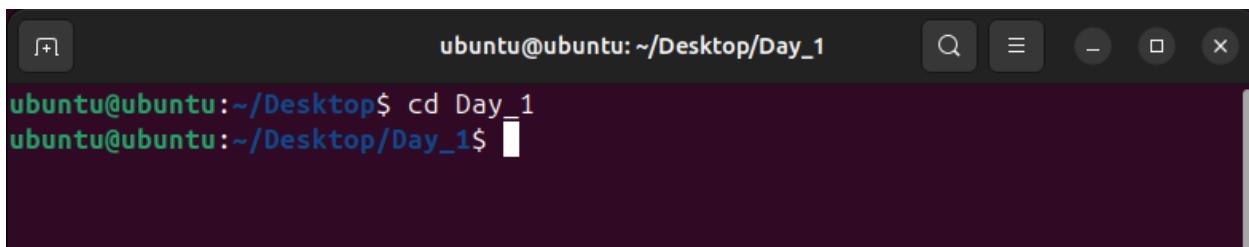
Practical No.5 - Hello World Programme with VIM Editor

1. Create a new folder “Day_1” in Desktop.



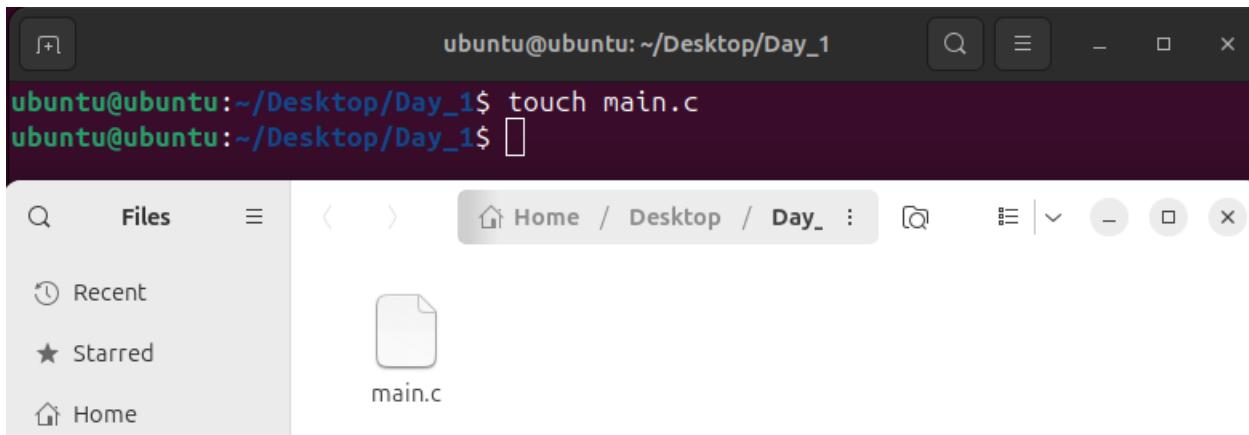
```
ubuntu@ubuntu:~/Desktop$ mkdir Day_1
ubuntu@ubuntu:~/Desktop$
```

2. Go inside that.



```
ubuntu@ubuntu:~/Desktop$ cd Day_1
ubuntu@ubuntu:~/Desktop/Day_1$
```

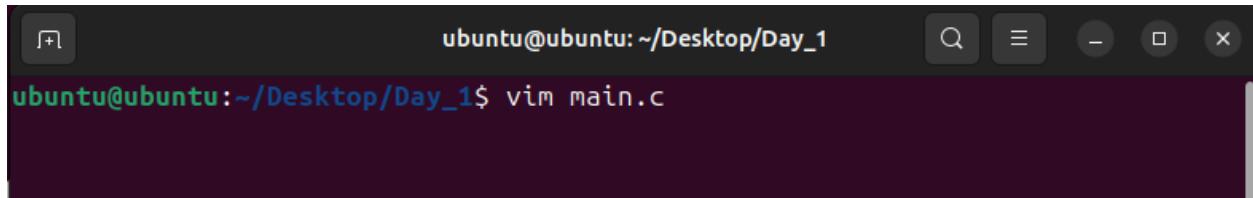
3. Create a file named “main.c”.



```
ubuntu@ubuntu:~/Desktop/Day_1$ touch main.c
ubuntu@ubuntu:~/Desktop/Day_1$
```

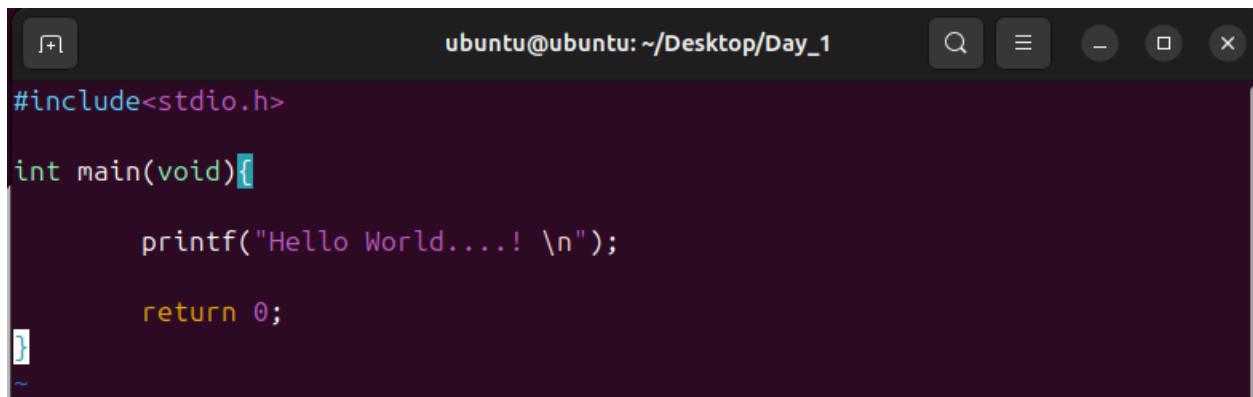
The image shows a file manager interface below the terminal. The sidebar on the left lists "Recent", "Starred", and "Home". The main area shows a single file named "main.c" with a document icon.

4. Open the file with “VIM Editor”



```
ubuntu@ubuntu:~/Desktop/Day_1$ vim main.c
```

5. Load Editor and write C Programme.



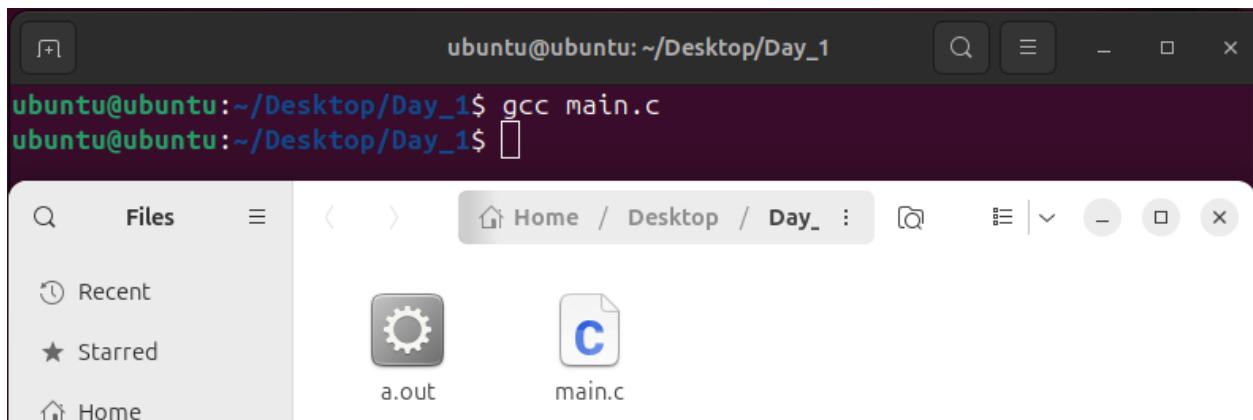
```
#include<stdio.h>

int main(void){

    printf("Hello World....! \n");

    return 0;
}
```

6. Compile the Programme with gcc. This created an “a.out” file at that directory.



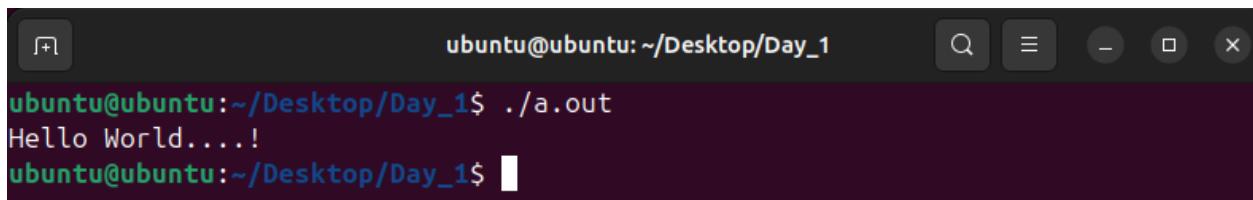
```
ubuntu@ubuntu:~/Desktop/Day_1$ gcc main.c
ubuntu@ubuntu:~/Desktop/Day_1$
```

Files

- Recent
- Starred
- Home

a.out main.c

7. Get output.



```
ubuntu@ubuntu:~/Desktop/Day_1$ ./a.out
Hello World....!
ubuntu@ubuntu:~/Desktop/Day_1$
```

Important Note: Steps to Delete a Virtual Machine in VirtualBox:

1. Shut Down the VM (if running):

- Make sure the VM is **powered off**.
If it's **paused or running**, right-click the VM > **Close** > **Power Off**.

2. Delete the VM from VirtualBox:

- Open **VirtualBox Manager**.
- In the list of VMs on the left, **right-click the VM** you want to delete.
- Click "**Remove...**" or "**Delete**" (depending on your version of VirtualBox).
- You'll get a prompt asking:

“Do you want to remove only the VM from the list or delete all files?”

3. Choose “Delete all files” (if you want to completely erase everything):

- This will delete:
 - The **virtual disk** (e.g., `.vdi`, `.vmdk`)
 - The **VM configuration files**
 - Saved states, logs, etc.
