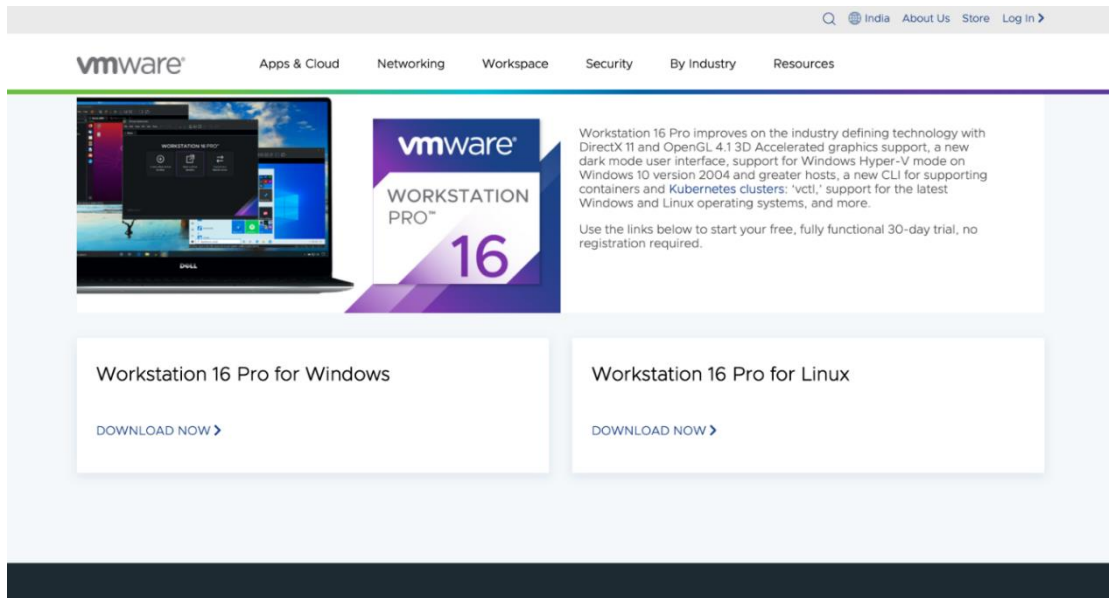


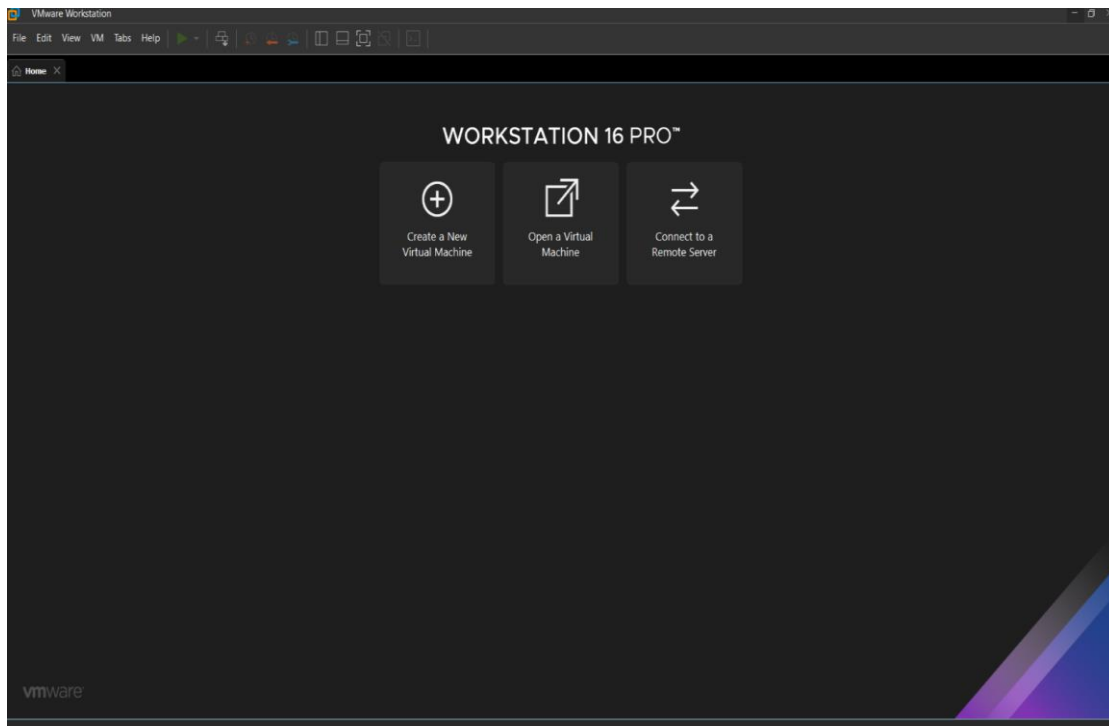
# Lab 1

**Aim:** To install a GCC compiler in the ubuntu virtual machine using VMware and execute a sample program.

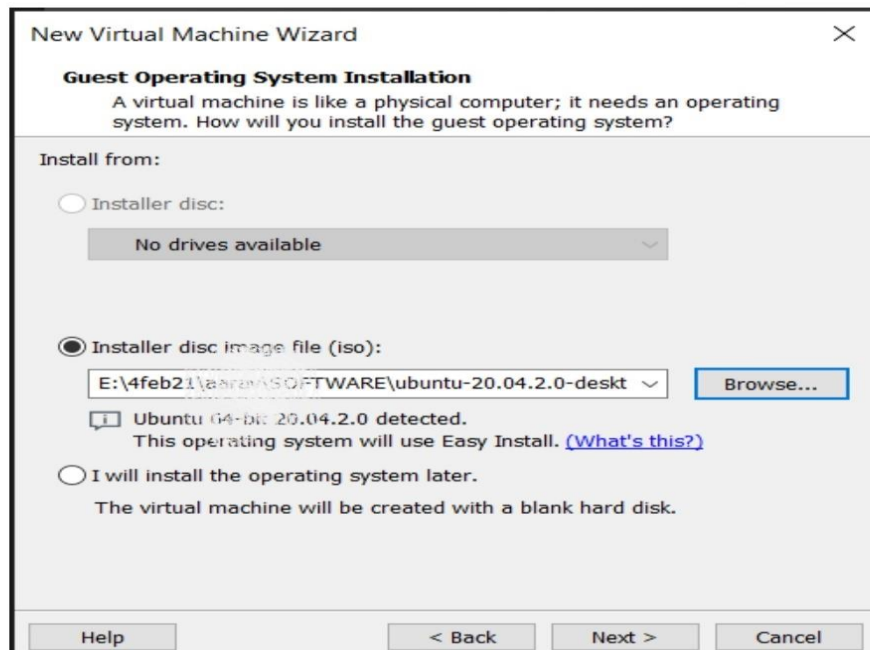
**Step1:** Install the VMware Workstation.



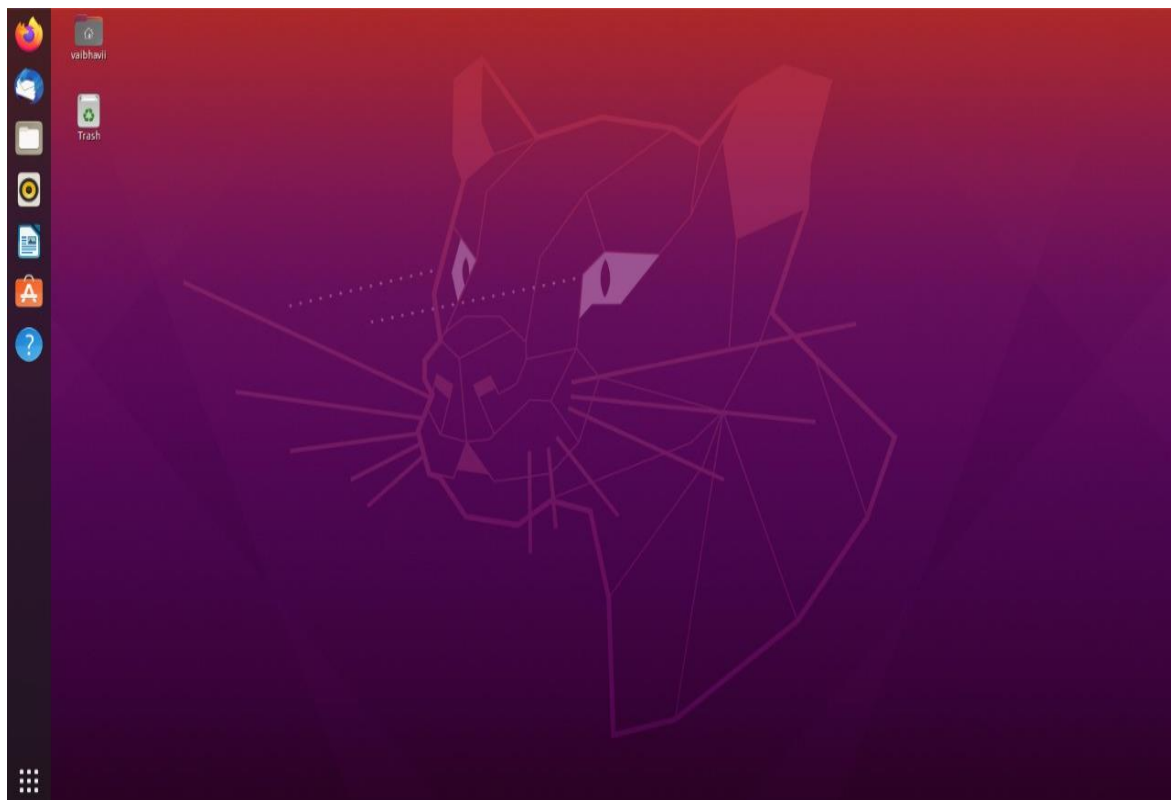
**Step 2:** After installation, open VMware Workstation and Click on create new virtual machine.



### Step 3: Browse Ubuntu ISO



### Step 4: Click 'next' and install ubuntu by selecting system preferences such as storage of your choice.



Step 5: Open terminal and enter the following commands:

1. `$ sudo add-apt-repository ppa:ubuntu-toolchain-r/test :`

To start installing and using software from a Personal Package Archive, you first need to tell Ubuntu where to find the PPA.

`add-apt-repository` adds a PPA to your list of sources. For e.g.: `sudo add-apt-repository ppa:user/ppa-name`, replace `ppa:user/ppa-name` with the PPA's location.

Your system will now fetch the PPA's key. This enables your Ubuntu system to verify that the packages in the PPA have not been interfered with since they were built.

2. `sudo apt-get update`

Now, as a one-off, you should tell your system to pull down the latest list of software from each archive it knows about, including the PPA you just added:

Now you're ready to start installing software from the PPA!

3. `$ sudo apt-get install gcc-6 gcc-6-base`

```
vaibhavi@Ubuntu:~$ sudo add-apt-repository ppa:ubuntu-toolchain-r/test
Toolchain test builds; see https://wiki.ubuntu.com/Toolchain

More info: https://launchpad.net/~ubuntu-toolchain-r/+archive/ubuntu/test
Press [ENTER] to continue or Ctrl-c to cancel adding it.

Hit:1 http://dl.google.com/linux/chrome/deb stable InRelease
Hit:2 http://in.archive.ubuntu.com/ubuntu focal InRelease
Get:3 http://ppa.launchpad.net/ubuntu-toolchain-r/test/ubuntu focal InRelease [17.5 kB]
Hit:4 http://in.archive.ubuntu.com/ubuntu focal-updates InRelease
Hit:5 http://in.archive.ubuntu.com/ubuntu focal-backports InRelease
Hit:6 http://security.ubuntu.com/ubuntu focal-security InRelease
Get:7 http://ppa.launchpad.net/ubuntu-toolchain-r/test/ubuntu focal/main i386 Packages [15.2 kB]
Get:8 http://ppa.launchpad.net/ubuntu-toolchain-r/test/ubuntu focal/main amd64 Packages [17.0 kB]
Get:9 http://ppa.launchpad.net/ubuntu-toolchain-r/test/ubuntu focal/main Translation-en [7,444 B]
Fetched 57.1 kB in 4s (13.9 kB/s)
Reading package lists... Done
vaibhavi@Ubuntu:~$ sudo apt-get update
Hit:1 http://dl.google.com/linux/chrome/deb stable InRelease
Hit:2 http://in.archive.ubuntu.com/ubuntu focal InRelease
Hit:3 http://security.ubuntu.com/ubuntu focal-security InRelease
Get:4 http://in.archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Hit:5 http://ppa.launchpad.net/ubuntu-toolchain-r/test/ubuntu focal InRelease
Get:6 http://in.archive.ubuntu.com/ubuntu focal-backports InRelease [101 kB]
Get:7 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 DEP-11 Metadata [283 kB]
Get:8 http://in.archive.ubuntu.com/ubuntu focal-updates/universe i386 Packages [626 kB]
Get:9 http://in.archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [843 kB]
Get:10 http://in.archive.ubuntu.com/ubuntu focal-updates/universe amd64 DEP-11 Metadata [339 kB]
Get:11 http://in.archive.ubuntu.com/ubuntu focal-updates/multiverse amd64 DEP-11 Metadata [2,468 B]
Get:12 http://in.archive.ubuntu.com/ubuntu focal-backports/universe amd64 DEP-11 Metadata [10.3 kB]
Fetched 2,317 kB in 46s (50.3 kB/s)
Reading package lists... Done
vaibhavi@Ubuntu:~$ sudo apt-get install gcc-6 gcc-6-base
Reading package lists... Done
Building dependency tree
Reading state information... Done
Package gcc-6 is not available, but is referred to by another package.
This may mean that the package is missing, has been obsoleted, or
is only available from another source

E: Package 'gcc-6' has no installation candidate
E: Unable to locate package gcc-6-base
vaibhavi@Ubuntu:~$ sudo apt-get install gcc-6 gcc-6-base
Reading package lists... Done
Building dependency tree
Reading state information... Done
Package gcc-6 is not available, but is referred to by another package.
This may mean that the package is missing, has been obsoleted, or
is only available from another source

E: Package 'gcc-6' has no installation candidate
E: Unable to locate package gcc-6-base
vaibhavi@Ubuntu:~$
```

```
valbhavi@Ubuntu: ~  
See "man sudo_root" for details.  
valbhavi@Ubuntu:~$ gcc --version  
Command 'gcc' not found, but can be installed with:  
  
sudo apt install gcc  
  
valbhavi@Ubuntu:~$ sudo apt install gcc  
[sudo] password for valbhavi:  
Sorry, try again.  
[sudo] password for valbhavi:  
Reading package lists... Done  
Building dependency tree  
Reading state information... Done  
The following additional packages will be installed:  
  binutils binutils-common binutils-x86-64-linux-gnu gcc-10-base gcc-9  
  libasan5 libatomic1 libbinutils libc-dev-bin libc6-dev libcrypt-dev  
  libctf-nobfd0 libctf0 libgcc-9-dev libgcc-s1 libgomp1 libitm1 liblsan0  
  libquadmath0 libstdc++6 libtsan0 libubsan1 linux-libc-dev manpages-dev  
Suggested packages:  
  binutils-doc gcc-multilib make autoconf automake libtool flex bison gcc-doc  
  gcc-9-multilib gcc-9-doc gcc-9-locales glibc-doc  
The following NEW packages will be installed:  
  binutils binutils-common binutils-x86-64-linux-gnu gcc gcc-9 libasan5  
  libatomic1 libbinutils libc-dev-bin libc6-dev libcrypt-dev libctf-nobfd0  
  libctf0 libgcc-9-dev libitm1 liblsan0 libquadmath0 libtsan0 libubsan1  
  linux-libc-dev manpages-dev  
The following packages will be upgraded:  
  gcc-10-base libctf0 libgcc-s1 libgomp1 libstdc++6  
5 upgraded, 21 newly installed, 0 to remove and 254 not upgraded.  
Need to get 24.0 MB of archives.  
After this operation, 107 MB of additional disk space will be used.  
Do you want to continue? [Y/n] y  
Get:1 http://ln.archive.ubuntu.com/ubuntu focal-updates/main amd64 libctf0 amd64 10.3.0-1ubuntu1-20.04 [48.8 kB]  
Get:2 http://ln.archive.ubuntu.com/ubuntu focal-updates/main amd64 gcc-10-base amd64 10.3.0-1ubuntu1-20.04 [20.2 kB]  
Get:3 http://ln.archive.ubuntu.com/ubuntu focal-updates/main amd64 libstdc++6 amd64 10.3.0-1ubuntu1-20.04 [501 kB]  
Get:4 http://ln.archive.ubuntu.com/ubuntu focal-updates/main amd64 libgomp1 amd64 10.3.0-1ubuntu1-20.04 [100 kB]  
Get:5 http://ln.archive.ubuntu.com/ubuntu focal-updates/main amd64 libgcc-s1 amd64 10.3.0-1ubuntu1-20.04 [41.8 kB]  
Get:6 http://ln.archive.ubuntu.com/ubuntu focal-updates/main amd64 binutils-common amd64 2.34-6ubuntu1.1 [207 kB]  
Get:7 http://ln.archive.ubuntu.com/ubuntu focal-updates/main amd64 libbinutils amd64 2.34-6ubuntu1.1 [475 kB]  
Get:8 http://ln.archive.ubuntu.com/ubuntu focal-updates/main amd64 libctf-nobfd0 amd64 2.34-6ubuntu1.1 [47.1 kB]  
Get:9 http://ln.archive.ubuntu.com/ubuntu focal-updates/main amd64 libctf0 amd64 2.34-6ubuntu1.1 [46.0 kB]  
Get:10 http://ln.archive.ubuntu.com/ubuntu focal-updates/main amd64 binutils-x86-64-linux-gnu amd64 2.34-6ubuntu1.1 [1,013 kB]  
Get:11 http://ln.archive.ubuntu.com/ubuntu focal-updates/main amd64 binutils amd64 2.34-6ubuntu1.1 [3,380 B]  
Get:12 http://ln.archive.ubuntu.com/ubuntu focal-updates/main amd64 libitm1 amd64 10.3.0-1ubuntu1-20.04 [26.2 kB]  
Get:13 http://ln.archive.ubuntu.com/ubuntu focal-updates/main amd64 libatomic1 amd64 10.3.0-1ubuntu1-20.04 [9,204 B]  
Get:14 http://ln.archive.ubuntu.com/ubuntu focal-updates/main amd64 libasan5 amd64 9.3.0-17ubuntu1-20.04 [394 kB]  
Get:15 http://ln.archive.ubuntu.com/ubuntu focal-updates/main amd64 liblsan0 amd64 10.3.0-1ubuntu1-20.04 [835 kB]  
Get:16 http://ln.archive.ubuntu.com/ubuntu focal-updates/main amd64 libtsan0 amd64 10.3.0-1ubuntu1-20.04 [2,009 kB]  
Get:17 http://ln.archive.ubuntu.com/ubuntu focal-updates/main amd64 libubsan1 amd64 10.3.0-1ubuntu1-20.04 [784 kB]  
Get:18 http://ln.archive.ubuntu.com/ubuntu focal-updates/main amd64 libquadmath0 amd64 10.3.0-1ubuntu1-20.04 [146 kB]  
Get:19 http://ln.archive.ubuntu.com/ubuntu focal-updates/main amd64 libgcc-9-dev amd64 9.3.0-17ubuntu1-20.04 [2,360 kB]  
Get:20 http://ln.archive.ubuntu.com/ubuntu focal-updates/main amd64 gcc-9 amd64 9.3.0-17ubuntu1-20.04 [8,241 kB]  
73% [20 gcc-9 7,783 kB/8,241 kB 94%]  
42.3 kB/s 2min 35s
```

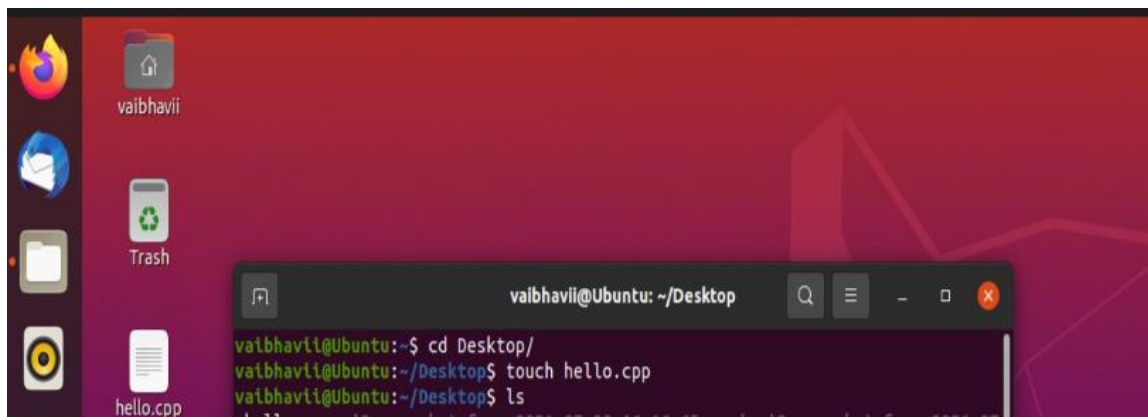
Step 6: To check whether the GCC was installed correctly or not use:

\$ gcc --version

\$ g++ --version

```
valbhavi@Ubuntu: ~  
valbhavi@Ubuntu:~$ gcc --version  
gcc (Ubuntu 9.3.0-17ubuntu1-20.04) 9.3.0  
Copyright (C) 2019 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.  
  
valbhavi@Ubuntu:~$ g++ --version  
g++ (Ubuntu 9.3.0-17ubuntu1-20.04) 9.3.0  
Copyright (C) 2019 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.  
  
valbhavi@Ubuntu:~$
```

Step 7: Create a file using touch command and write content in the file.

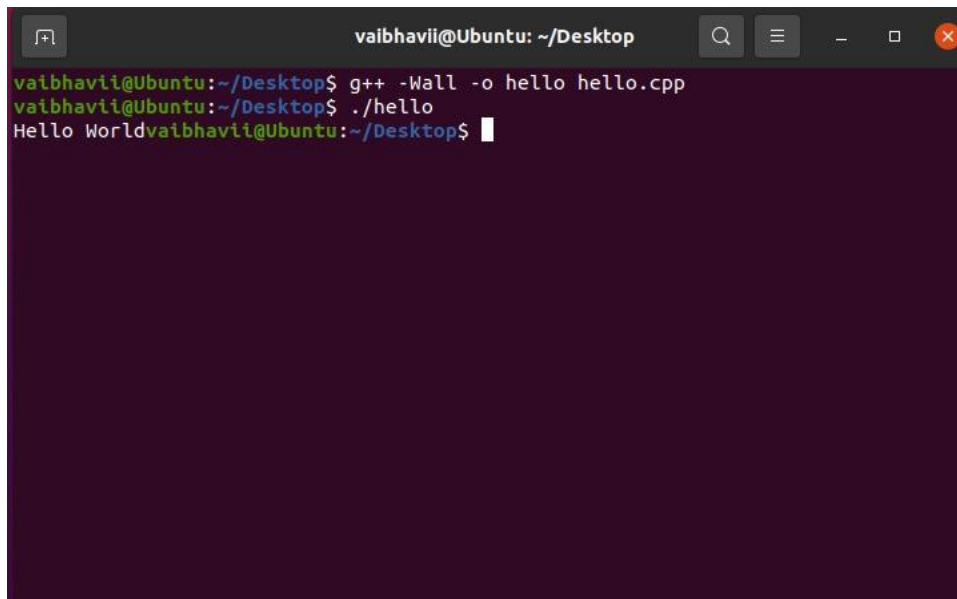


```
Open ▼ [+]
```

```
1 #include<iostream>
2 using namespace std;
3 int main()
4 {
5     cout<<"Hello World";
6     return 0;
7 }
8
```

Step 8: Run the program using:

Assuming the source code is saved in a file welcome.cpp, we can do that using GNU C++ compiler g++, for example `g++ -Wall -o hello hello.cpp`

A terminal window titled 'vaibhavi@Ubuntu: ~/Desktop' with standard window controls. The terminal shows the following commands and output:

```
vaibhavi@Ubuntu:~/Desktop$ g++ -Wall -o hello hello.cpp
vaibhavi@Ubuntu:~/Desktop$ ./hello
Hello Worldvaibhavi@Ubuntu:~/Desktop$
```

Result:

Thus, the GCC compiler has been successfully installed and executed a sample program.