

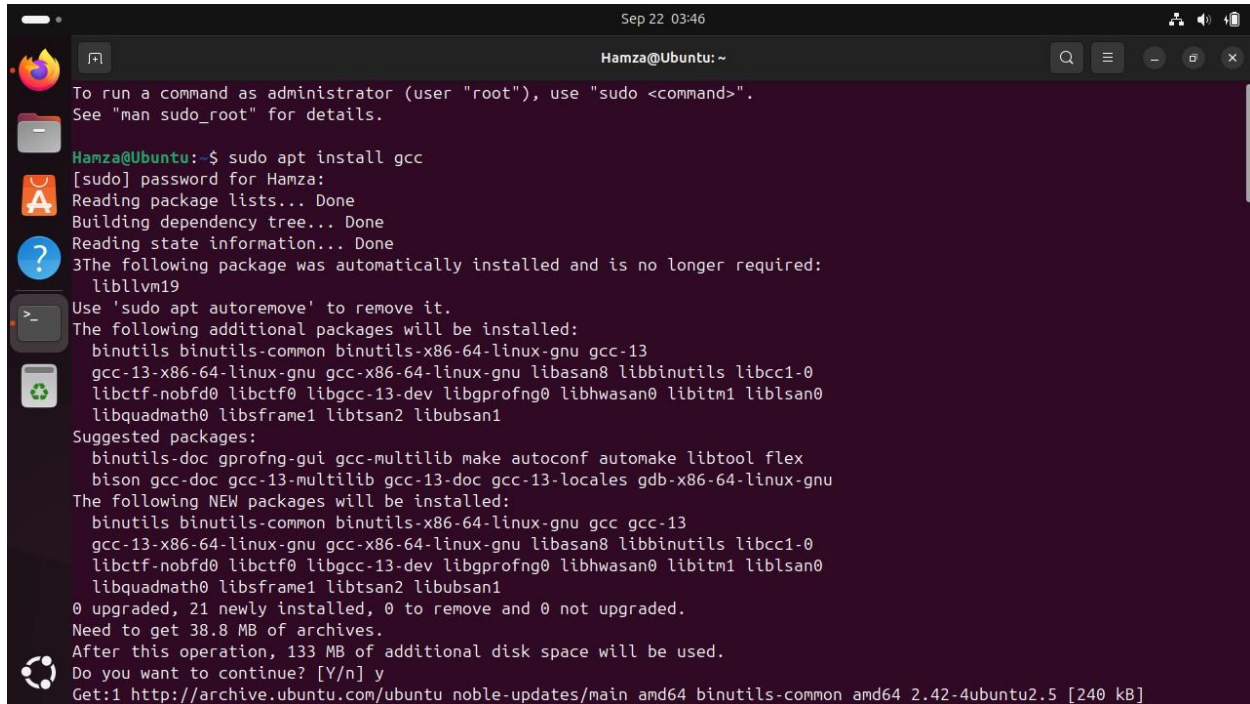
NAME: Hamza Rahim

SAP_ID:56776

COURSE: OPERATING SYSTEM

Installing GCC:

Sudo apt install gcc

A terminal window titled 'Hamza@Ubuntu: ~' with a timestamp of 'Sep 22 03:46'. The terminal shows the command 'sudo apt install gcc' being executed. It prompts for a password, then shows the progress of reading package lists, building the dependency tree, and reading state information. It lists packages to be removed (libllvm19) and additional packages to be installed (binutils, gcc-13, etc.). It also shows suggested packages and the final disk space requirements. The installation proceeds successfully after confirming with 'y'.

```
Hamza@Ubuntu: ~  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
Hamza@Ubuntu:~$ sudo apt install gcc  
[sudo] password for Hamza:  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
3The following package was automatically installed and is no longer required:  
  libllvm19  
Use 'sudo apt autoremove' to remove it.  
The following additional packages will be installed:  
  binutils binutils-common binutils-x86-64-linux-gnu gcc-13  
  gcc-13-x86-64-linux-gnu gcc-x86-64-linux-gnu libasan8 libbinutils libcc1-0  
  libctf-nobfd0 libctf0 libgcc-13-dev libgprofng0 libhwasan0 libitm1 liblsan0  
  libquadmath0 libsframe1 libtsan2 libubsan1  
Suggested packages:  
  binutils-doc gprofng-gui gcc-multilib make autoconf automake libtool flex  
  bison gcc-doc gcc-13-multilib gcc-13-doc gcc-13-locales gdb-x86-64-linux-gnu  
The following NEW packages will be installed:  
  binutils binutils-common binutils-x86-64-linux-gnu gcc gcc-13  
  gcc-13-x86-64-linux-gnu gcc-x86-64-linux-gnu libasan8 libbinutils libcc1-0  
  libctf-nobfd0 libctf0 libgcc-13-dev libgprofng0 libhwasan0 libitm1 liblsan0  
  libquadmath0 libsframe1 libtsan2 libubsan1  
0 upgraded, 21 newly installed, 0 to remove and 0 not upgraded.  
Need to get 38.8 MB of archives.  
After this operation, 133 MB of additional disk space will be used.  
Do you want to continue? [Y/n] y  
Get:1 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 binutils-common amd64 2.42-4ubuntu2.5 [240 kB]
```

Installed Gcc:

gcc -version

```
Sep 22 03:47
Hamza@Ubuntu: ~
Setting up libctf-nobfd0:amd64 (2.42-4ubuntu2.5) ...
Setting up libsframe1:amd64 (2.42-4ubuntu2.5) ...
Setting up libquadmath0:amd64 (14.2.0-4ubuntu2~24.04) ...
Setting up libubsan1:amd64 (14.2.0-4ubuntu2~24.04) ...
Setting up libhwasan0:amd64 (14.2.0-4ubuntu2~24.04) ...
Setting up libasan8:amd64 (14.2.0-4ubuntu2~24.04) ...
Setting up libtsan2:amd64 (14.2.0-4ubuntu2~24.04) ...
Setting up libbinutils:amd64 (2.42-4ubuntu2.5) ...
Setting up libcc1-0:amd64 (14.2.0-4ubuntu2~24.04) ...
Setting up liblsan0:amd64 (14.2.0-4ubuntu2~24.04) ...
Setting up libitm1:amd64 (14.2.0-4ubuntu2~24.04) ...
Setting up libctf0:amd64 (2.42-4ubuntu2.5) ...
Setting up libgprofng0:amd64 (2.42-4ubuntu2.5) ...
Setting up libgcc-13-dev:amd64 (13.3.0-6ubuntu2~24.04) ...
Setting up binutils-x86-64-linux-gnu (2.42-4ubuntu2.5) ...
Setting up gcc-13-x86-64-linux-gnu (13.3.0-6ubuntu2~24.04) ...
Setting up binutils (2.42-4ubuntu2.5) ...
Setting up gcc-13 (13.3.0-6ubuntu2~24.04) ...
Setting up gcc-x86-64-linux-gnu (4:13.2.0-7ubuntu1) ...
Setting up gcc (4:13.2.0-7ubuntu1) ...
Processing triggers for man-db (2.12.0-4build2) ...
Processing triggers for libc-bin (2.39-0ubuntu8.5) ...
Hamza@Ubuntu:~$ gcc --version
gcc (Ubuntu 13.3.0-6ubuntu2~24.04) 13.3.0
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.
Hamza@Ubuntu:~$
```

C++ PROGRAM:

```
Hamza@Ubuntu:~$ touch firstprogram.c
Hamza@Ubuntu:~$ mkdir lab05
Hamza@Ubuntu:~$ cd lab05
Hamza@Ubuntu:~/lab05$ touch hello.c
Hamza@Ubuntu:~/lab05$ cat>hello.c
#include<stdio.h>
int main(){
printf("Hello world.....\n");
return 0;
}Hamza@Ubuntu:~/lab05$ gcc hello.c -o hello
gcc: error: unrecognized command-line option '-o'
Hamza@Ubuntu:~/lab05$ gcc hello.c -o hello
Hamza@Ubuntu:~/lab05$ gcc hello.c -o hello
Hamza@Ubuntu:~/lab05$ ./hello
Hello world.....
Hamza@Ubuntu:~/lab05$
```

Even and odd code:

```
#include<stdio.h>
int main(){
int num;
printf("Enter a NUMBER");
scanf("%d",&num);
if(num% 2==0){
printf("%d is even",num);
}
else{
printf("%d is odd",num);
}return 0;
}
```

```
Hamza@Ubuntu:~$ mkdir lab-5
Hamza@Ubuntu:~$ cd lab-5
Hamza@Ubuntu:~/lab-5$ gcc hello.c -o hello
Hamza@Ubuntu:~/lab-5$ ./hello
Enter a NUMBER0
0 is evenHamza@Ubuntu:~/lab-5$
```

Java code:

```
public class hamza {
    public static void main(String[] args) {
        System.out.println("Hello, World!");
    }
}
```

Java commands:

```

-----
1 problem (1 error)
Hamza@Ubuntu:~/lab-5$ javac hamza.java
Hamza@Ubuntu:~/lab-5$ Java hamza
Command 'Java' not found, did you mean:
  command 'java' from deb openjdk-17-jre-headless (17.0.16+8~us1-0ubuntu1~24.04.1)
  command 'java' from deb openjdk-21-jre-headless (21.0.8+9~us1-0ubuntu1~24.04.1)
  command 'java' from deb default-jre (2:1.17-75)
  command 'java' from deb openjdk-11-jre-headless (11.0.28+6-1ubuntu1~24.04.1)
  command 'java' from deb openjdk-8-jre-headless (8u462-ga~us1-0ubuntu2~24.04.2)
  command 'java' from deb openjdk-19-jre-headless (19.0.2+7-4)
  command 'java' from deb openjdk-20-jre-headless (20.0.2+9-1)
  command 'java' from deb openjdk-22-jre-headless (22~22ea-1)
  command 'fava' from deb python3-fava (1.23.1+dfsg-1)
  command 'cava' from deb cava (0.7.4-1)
  command 'ava' from deb ava (5.3.1+dfsg+~cs46.3.10-3)
Try: sudo apt install <deb name>
Hamza@Ubuntu:~/lab-5$ java hamza
Hello, World!
Hamza@Ubuntu:~/lab-5$ 

```

DATE COMMAND:

```

0 is evenHamza@Ubuntu:~/lab-5$ date
Mon Sep 22 04:59:08 AM UTC 2025
Hamza@Ubuntu:~/lab-5$ 

```

Remain Parts of Lab 4:

1. Create 3 empty text files

```

Hamza@Ubuntu:~$ touch students.txt
Hamza@Ubuntu:~$ touch pstudent.txt
Hamza@Ubuntu:~$ touch fstudent.txt
Hamza@Ubuntu:~$ ls
adir          hamza.c      labo5        Pictures     Templates
Desktop       hamza.txt    laboo5       pstudent.txt Videos
Documents     hello.c      labs05       Public
Downloads     lab_05       labs3        snap
firstprogram.c lab05        labs4        students
fstudent.txt lab-5        Music        students.txt
Hamza@Ubuntu:~$ 

```

2. Assign read-only permission to the user

Symbolic method:

```
Hamza@Ubuntu:~$ chmod u=r students.txt
Hamza@Ubuntu:~$ chmod u=r pstudent.txt
Hamza@Ubuntu:~$ chmod u=r fstudent.txt
Hamza@Ubuntu:~$
```

- Numeric method:

```
Hamza@Ubuntu:~$ chmod 400 students.txt
Hamza@Ubuntu:~$ chmod 400 pstudent.txt
Hamza@Ubuntu:~$ chmod 400 fstudent.txt
Hamza@Ubuntu:~$
```

3. Add 10 student names

```
Hamza@Ubuntu:~$ echo -e "ALi\nALi\nHamza\nNoman\nAHMAD\nCAT\nNoman\nALi\nALi\n" > pstudent.txt
bash: pstudent.txt: Permission denied
Hamza@Ubuntu:~$ sudo echo -e "ALi\nHamza\nHamza\nHamza\nHamza\nHamza\nHamza\nHamza\nHamza\n" > pstudent.txt
bash: pstudent.txt: Permission denied
Hamza@Ubuntu:~$ chmod u+w pstudent.txt fstudent.txt
Hamza@Ubuntu:~$ sudo echo -e "ALi\nHamza\nHamza\nHamza\nHamza\nHamza\nHamza\nHamza\nHamza\n" > pstudent.txt
[sudo] password for Hamza:
123
Sorry, try again.
[sudo] password for Hamza:
Hamza@Ubuntu:~$ sudo echo -e "ALi\nHamza\nHamza\nHamza\nHamza\nHamza\nHamza\nHamza\nHamza\n" > fstudent.txt
Hamza@Ubuntu:~$
```

4. Create directory RIPHAH and set permissions

```
Hamza@Ubuntu:~$ mkdir RIPHAH
Hamza@Ubuntu:~$ chmod u=r,g=r RIPHAH
Hamza@Ubuntu:~$ chmod 400 RIPHAH
Hamza@Ubuntu:~$
```

5. Copy all files into RIPHAH

```
Hamza@Ubuntu:~$ sudo cp students.txt pstudent.txt fstudent.
txt RIPHAH/
Hamza@Ubuntu:~$
```

6. Append sorted names into students.txt

```
Hamza@Ubuntu:~$ chmod u+w pstudent.txt
Hamza@Ubuntu:~$ sudo sort pstudent.txt | head -5 >>pstudent.
txt
Hamza@Ubuntu:~$ sudo sort pstudent.txt | tail -5 >>pstudent.
txt
Hamza@Ubuntu:~$
```

7. Show contents of pstudents.txt (sorted names only)

```
Hamza@Ubuntu:~$ cat pstudent.txt
```

```
ALI  
HAMza  
HAMza  
HAMza  
HAMza  
HAMza  
HAMza  
HAzma  
Hamaz  
HAMza
```

```
ALI  
Hamaz  
HAMza  
HAMza  
HAMza  
HAMza  
HAMza  
HAMza  
HAMza  
HAzma
```

```
Hamza@Ubuntu:~$
```

8. Change permissions

```
Hamza@Ubuntu:~$ chmod u=r students.txt  
Hamza@Ubuntu:~$ chmod u=r pstudent.txt fstudent.txt  
Hamza@Ubuntu:~$ chmod 400 students.txt  
Hamza@Ubuntu:~$ chmod 600 pstudent.txt fstudent.txt  
Hamza@Ubuntu:~$
```

9. Append another student name in students.txt

```
Hamza@Ubuntu:~$ chmod u+w students.txt  
Hamza@Ubuntu:~$ echo "Newstudent">>students.txt  
Hamza@Ubuntu:~$ chmod u=r students.txt  
Hamza@Ubuntu:~$
```

10. Display contents of all files

```
Hamza@Ubuntu:~$ cat students.txt  
Newstudent
```

```
Hamza@Ubuntu:~$ cat pstudent.txt
```

```
ALI  
HAMza  
HAMza  
HAMza  
HAMza  
HAMza  
HAMza  
HAzma  
Hamaz  
HAMza
```

```
ALI  
Hamaz  
HAMza  
HAMza  
HAMza  
HAMza  
HAMza  
HAMza  
HAMza  
HAzma
```

```
Hamza@Ubuntu:~$ cat fstudent.txt
```

```
ALi  
Hamza  
Hamza  
HAMza  
Hamza  
Hamza  
Hamza  
Hamza  
Hamza  
Hamza
```

11. Show permissions and contents of RIPHAH

```
Hamza@Ubuntu:~$ ls -l RIPHAH
ls: cannot access 'RIPHAH/fstudent.txt': Permission denied
ls: cannot access 'RIPHAH/students.txt': Permission denied
ls: cannot access 'RIPHAH/pstudent.txt': Permission denied
total 0
-?????????? ? ? ? ?           ? fstudent.txt
-?????????? ? ? ? ?           ? pstudent.txt
-?????????? ? ? ? ?           ? students.txt
Hamza@Ubuntu:~$ sudo ls -l RIPHAH
total 8
-rw----- 1 root root 59 Sep 23 06:42 fstudent.txt
-rw----- 1 root root 59 Sep 23 06:42 pstudent.txt
-r----- 1 root root  0 Sep 23 06:42 students.txt
Hamza@Ubuntu:~$
```



```
Hamza@Ubuntu:~$ cat RIPHAH/students.txt
cat: RIPHAH/students.txt: Permission denied
Hamza@Ubuntu:~$ sudo cat RIPHAH/students.txt
Hamza@Ubuntu:~$ sudo cat RIPHAH/pstudent.txt
ALI
HAMza
HAMza
HAMza
HAMza
HAMza
HAMza
HAZma
Hamaz
HAMza

Hamza@Ubuntu:~$ sudo cat RIPHAH/fstudent.txt
ALi
Hamza
Hamza
HAMza
Hamza
Hamza
Hamza
Hamza
Hamza
Hamza

Hamza@Ubuntu:~$
```