



INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

Programming in C and C++ (CSC-101)

Assignment 1 : Prerequisite for C programming (Understanding basic of Linux)

All the below questions will be done on Linux Terminal using commands

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Problem 1: Creating directory and Files in Linux

- 1) In the home directory create a folder named <Your_Rollnum>.
- 2) Write appropriate commands to go inside the folder created and create a folder named **Assignment1**.
- 3) Inside Assignment1, create three subdirectories: **Question1, Question2, Question3, Question4, Question5** .
- 4) Inside **Question1**, create five empty files named **log1.txt to log5.txt** in one single command. List the contents of the current directory.
- 5) Verify the directory structure using the appropriate command. Install the corresponding package to see the directory structure

```
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question1 - □ ✎
garvmehta991@omnitrix-1000:~$ pwd
/home/garvmehta991
garvmehta991@omnitrix-1000:~$ mkdir 25114035
garvmehta991@omnitrix-1000:~$ cd 25114035/
garvmehta991@omnitrix-1000:~/25114035$ mkdir Assignment1
garvmehta991@omnitrix-1000:~/25114035$ cd Assignment1/
garvmehta991@omnitrix-1000:~/25114035/Assignment1$ mkdir Question{1..5}
garvmehta991@omnitrix-1000:~/25114035/Assignment1$ cd Question1
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question1$ touch log{1..5}.txt
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question1$ ls
log1.txt log2.txt log3.txt log4.txt log5.txt
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question1$ tree
.
├── log1.txt
├── log2.txt
├── log3.txt
├── log4.txt
└── log5.txt

1 directory, 5 files
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question1$
```

Problem 2: Adding and Modifying the contents of a file

- 1) Go to the folder **Question2**, create a new empty file named **notes.txt**.
- 2) Add the text “Welcome to Linux Lab” into **notes.txt** (without opening an editor).
- 3) Append a new line “This is the second line.” to the same file without erasing the previous content without using the editor.
- 4) Display the contents of **notes.txt** on the terminal.
- 5) Overwrite the file **notes.txt** so it only contains “Linux is powerful!”.
- 6) Append the output of the date command to **notes.txt**.
- 7) Append the names of all **.txt** files in the current directory into **notes.txt** using the command line.
- 8) Verify the number of lines in **notes.txt**.

```
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question2
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question2$ cd ../Question2
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question2$ echo "Welcome to Linux Lab" >> notes.txt
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question2$ echo "This is the seecond line." >> notes.txt
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question2$ cat notes.txt
Welcome to Linux Lab
This is the seecond line.
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question2$ echo "Linux is powerful!"> notes.txt
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question2$ date >> notes.txt
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question2$ echo *.txt >> notes.txt
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question2$ wc -l notes.txt
3 notes.txt
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question2$ cat notes.txt
Linux is powerful!
Thursday 14 August 2025 05:12:38 PM IST
notes.txt
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question2$
```

Problem 3: Renaming , copying and moving files

- 1) Inside Question3, create the following empty files **file1.txt**, **file2.txt**, **file3.txt** in a single command.
- 2) Rename **file1.txt** to **report.txt**. Copy **report.txt** into a new file named **report_backup.txt** (in the same folder).
- 3) Create a subdirectory named **Archive** inside Question3 and move **file2.txt** into it.
- 4) Copy all **.txt** files from Question3 into **Archive** in one single command.
- 5) Rename **file3.txt** to **data_2025.txt**. Create three files named **data_2024.txt,data_2023.txt,data_2022.txt** in the current directory. Move all files starting with data into the Archive folder.
- 6) Create a folder **Backup** inside your home directory and copy the entire Question3 folder (including its files & subdirectories) into **Backup**.

```
garvmehta991@omnitrix-1000:~/25114035/Assignment1$ touch file{1,2,3}.txt
garvmehta991@omnitrix-1000:~/25114035/Assignment1$ mkdir Archive && mv file2.txt Archive
garvmehta991@omnitrix-1000:~/25114035/Assignment1$ cp *.txt Archive
garvmehta991@omnitrix-1000:~/25114035/Assignment1$ mv file3.txt data_2025.txt
garvmehta991@omnitrix-1000:~/25114035/Assignment1$ data_202{2,3,4}.txt
data_2022.txt: command not found
garvmehta991@omnitrix-1000:~/25114035/Assignment1$ touch data_202{2,3,4}.txt
garvmehta991@omnitrix-1000:~/25114035/Assignment1$ mv data* Archive
garvmehta991@omnitrix-1000:~/25114035/Assignment1$ cd ../..
garvmehta991@omnitrix-1000:~/25114035$ cd Assignment1/ && mkdir Backup
garvmehta991@omnitrix-1000:~/25114035$ cp -rf Question3 Backup
garvmehta991@omnitrix-1000:~/25114035$ tree
.
+-- Backup
    +-- Question3
        +-- Archive
            +-- data_2022.txt
            +-- data_2023.txt
            +-- data_2024.txt
            +-- data_2025.txt
            +-- file2.txt
            +-- file3.txt
            +-- report_backup.txt
            +-- report.txt
            +-- report_backup.txt
            +-- report.txt
        +-- Question1
            +-- log1.txt
            +-- log2.txt
            +-- log3.txt
            +-- log4.txt
            +-- log5.txt
        +-- Question2
            +-- notes.txt
        +-- Question3
            +-- Archive
                +-- data_2022.txt
                +-- data_2023.txt
                +-- data_2024.txt
                +-- data_2025.txt
                +-- file2.txt
                +-- file3.txt
                +-- report_backup.txt
                +-- report.txt
                +-- report_backup.txt
                +-- report.txt
        +-- Question4
        +-- Question5

10 directories, 26 files
garvmehta991@omnitrix-1000:~/25114035/Assignment1$
```

Problem 4: Modifying and changing permission of the files

- 1) In the directory named Question4 in your home directory, create a file **notes.txt** and add some text to it. View the current permissions of **notes.txt**.
- 2) Remove the write permission for *others* on notes.txt. Add execute permission for the *owner* of **notes.txt**.
- 3) Create three new files in Lab4 in a single command.
 - a) Give *read-only* permission to everyone for **file1.txt**.
 - b) Give *read & write* permission to owner, but *read-only* to group & others for **file2.txt**.
 - c) Make **file3.txt** executable by everyone.
- 4) Create a subdirectory Scripts inside Lab4 and give all permission to everyone

```
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question4
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question4$ touch notes.txt
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question4$ echo "Hello World!" >> notes.txt
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question4$ ls -lrtr notes.txt
-rw-rw-r-- 1 garvmehta991 garvmehta991 13 Aug 15 10:02 notes.txt
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question4$ chmod o-w notes.txt
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question4$ chmod u+x notes.txt
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question4$ touch file{1,2,3}.txt
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question4$ chmod a=r file1.txt
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question4$ chmod u=rw file2.txt
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question4$ chmod go=r file2.txt
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question4$ chmod a=x file3.txt
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question4$ mkdir Scripts
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question4$ chmod a=rwx Scripts
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question4$ ls -lrtr
total 8
-rwxrw-r-- 1 garvmehta991 garvmehta991 13 Aug 15 10:02 notes.txt
---x--x--x 1 garvmehta991 garvmehta991 0 Aug 15 10:11 file3.txt
-rw-r--r-- 1 garvmehta991 garvmehta991 0 Aug 15 10:11 file2.txt
-r--r--r-- 1 garvmehta991 garvmehta991 0 Aug 15 10:11 file1.txt
drwxrwxrwx 2 garvmehta991 garvmehta991 4096 Aug 15 10:13 Scripts
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question4$
```

Problem 5: Writing the first C program, compiling and running

- 1) Inside the directory Question5 in your current directory create a new file MyfirstProgram.c and write a simple C program that prints "Hello World".
- 2) Compile the program using gcc and generate an executable named hello. Run the program and capture its output.
- 3) Modify the program to also print

"Bingo!!! I learnt to compile and run a C program in Linux!!! I will always use Linux for programming in future."

- 4) Compile hello.c with **all warnings enabled** (-Wall) and save the executable as **hello_v2**. Run the program with **hello_v2** and check if it works without warnings.

```
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question5 - □ ✎
#include<stdio.h>

int main() {
    printf("Hello World\n");
    return 0;
}                                     1,1          All
```

```
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question5 - □ ✎
#include<stdio.h>

int main() {
    printf("Hello World\n");
    printf("Bingo!!! I learnt to compile and run a C program in Linux!!! I will always use Linux for programming in future\n");
    return 0;
} -- INSERT --                                     5,121-128          All
```

```
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question5 - □ ✎
#include<stdio.h>

int main() {
    printf("Hello Again.\n");
    return 0;
}
~                                         "hello.c" 6L, 72B          3,8          All
```

```
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question5
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question5$ touch Myfirstprogram.c
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question5$ vim Myfirstprogram.c
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question5$ gcc Myfirstprogram.c -o hello
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question5$ ./hello
Hello World
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question5$ la
hello Myfirstprogram.c
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question5$ vim Myfirstprogram.c
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question5$ touch hello.c && vim hello.c
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question5$ vim hello.c
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question5$ gcc -Wall hello.c -o hello_v2
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question5$ ./hello_v2
Hello Again.
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question5$ la
hello hello.c hello_v2 Myfirstprogram.c
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question5$ la -lrtr
total 40
-rwxrwxr-x 1 garvmehta991 garvmehta991 15968 Aug 15 10:31 hello
-rw-rw-r-- 1 garvmehta991 garvmehta991    195 Aug 15 10:34 Myfirstprogram.c
-rw-rw-r-- 1 garvmehta991 garvmehta991     72 Aug 15 10:36 hello.c
-rwxrwxr-x 1 garvmehta991 garvmehta991 15960 Aug 15 10:37 hello_v2
garvmehta991@omnitrix-1000:~/25114035/Assignment1/Question5$
```