



# Programming Fundamentals

Week 01 - Lab Manual



## Introduction

Welcome to your first programming Lab. In this lab manual, we shall work together to learn and implement new concepts, including the difference between a Graphical User Interface (GUI) and a Command Line Interface (CLI), creating text files in different directories using both GUI and CLI, and navigating different directories using both GUI and CLI.

## Skills to be learned:

- Creating, Storing, and Locating files and Directories using GUI and CLI

## Let's Start Interacting With Computers.

Consider the following scenario.



Hello Guys, I am Ali.

### TASK 01(WP):

Ali is a student, and he got admission to UET Lahore. He bought a new laptop, but he is new to using computers. He does not know how to use the computer properly or manage different things.

His University teacher shared different soft copies of books and files with him for different subjects. Now he is confused about how to manage different files for different subjects. **Let's help him.**

### Solution:

First Thing First, Tell Ali to Press the Power Button to Turn on the Computer.



**Skill:** Creating, Storing, and Location files/directories through windows explorer and CLI

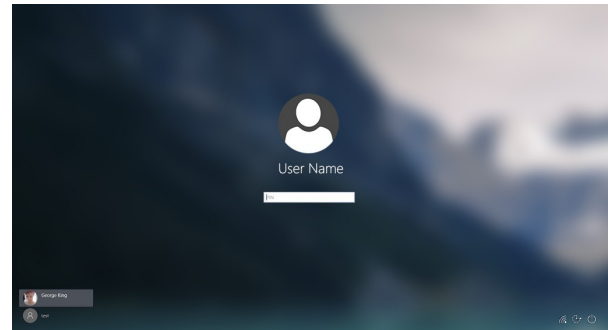


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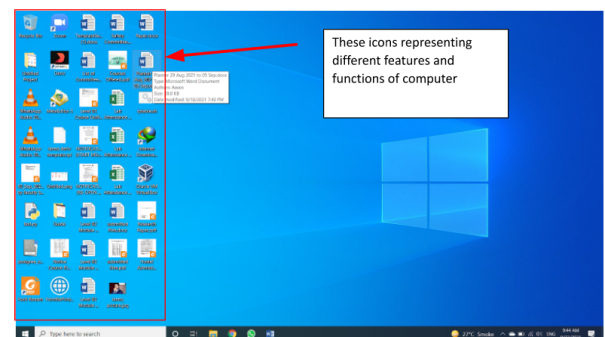


On this Screen,  
**Ali** needs to enter his password and he presses the **Enter button** from the keyboard.



Welcome to the screen.  
It is called the **Desktop Screen**.

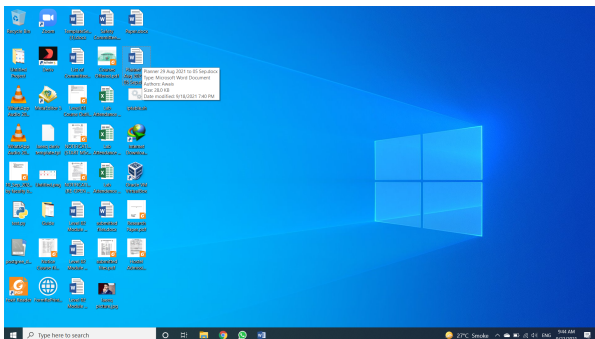
**You Have Done A Great Job. Ali is Very Excited. He can see different Files, Folders, and Icons on the Screen. This is called a Graphical User Interface.**



Let's educate Ali about **different types of interfaces**. There are two kinds of interfaces

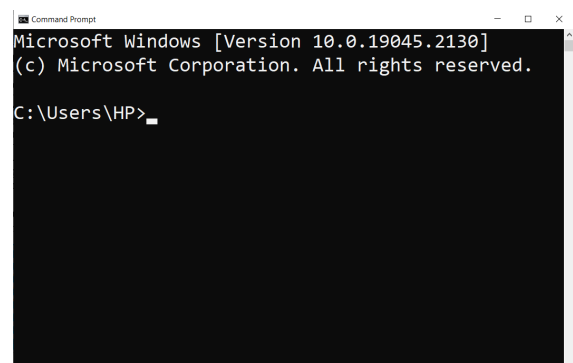
- Graphical User Interface (GUI)
- Command Line Interface (CLI)

If you use your computer by interacting with graphics, images, and icons it is called a **Graphical User Interface (GUI)**. In a graphical user interface, the user can use the computer mouse or Keyboard to click on buttons and icons. For Example,



Using a computer by writing commands on this black screen is called **command line interface** or CLI.

For example,



Now we will help Ali to use computers with both GUI and CLI.

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But Why do we need to learn both interfaces?

Look at their comparison below to develop a better understanding of this.

Graphical User Interface (GUI) is:

- Easy to use
- Slower
- Good for non-technical personnel
- Has limited functionality

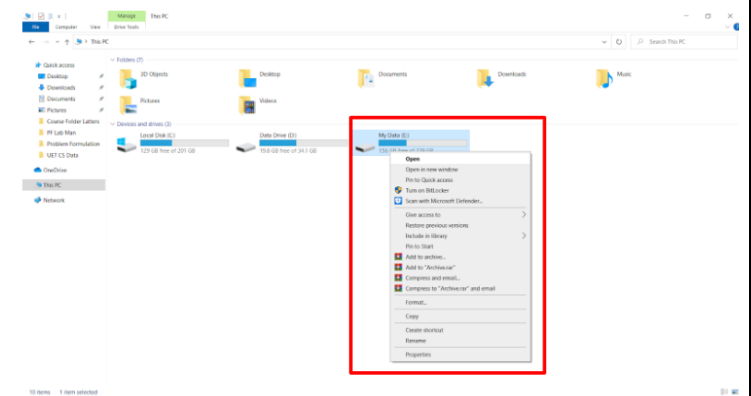
Command Line Interface (CLI) is:

- Hard to use
- Faster
- Good for technical personnel
- Have more feature access

Now Ali has been given some soft copy books by his teacher. Let's help him to manage the files properly.

Let's learn the first step.

To open a drive/folder in GUI (Graphical User Interface) we **double-click** on the drive icon or **right-click** on the icon and select the **open** option from the list.



Let's learn to create a folder

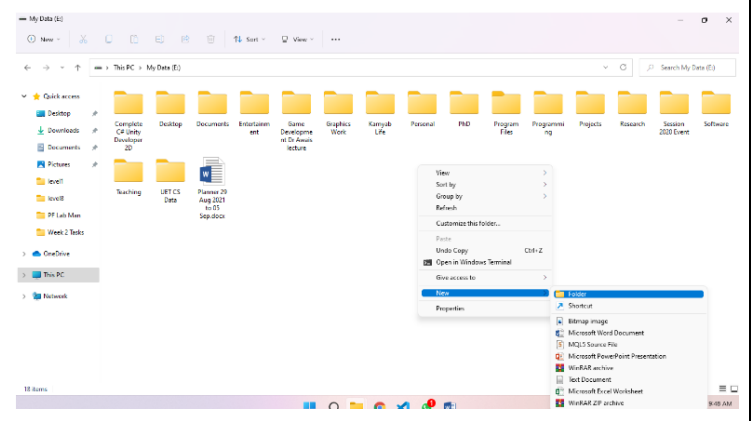
We need to create a **Study folder** that should contain three more folders with the following names

- Programming
- I2C
- English

We are going to create the first folder with the name **“Study”** by following these steps

Using GUI

- Right-click on the blank space
- Select the New option from the list
- Click on New Folder
- Name it **Study**



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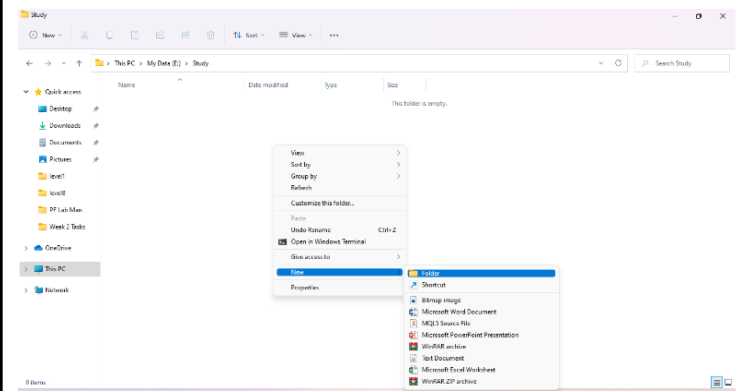
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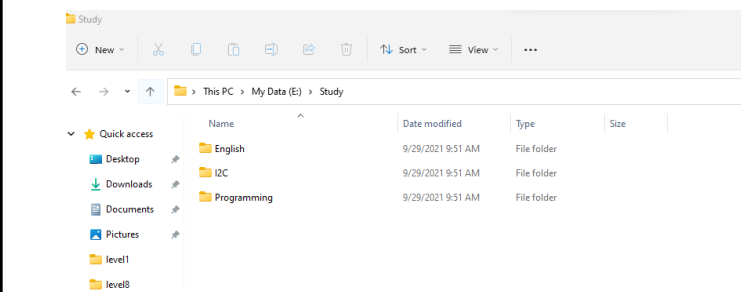


Now, We need to create more three folders inside this folder with the following names

- Programming
- I2C
- English

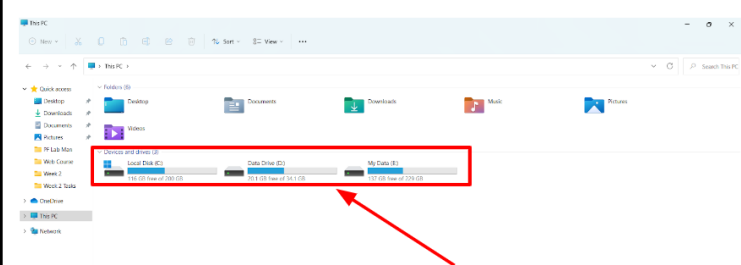


This image is showing the newly created folders



Great Job Guys, Now Let's Teach Ali about CLI.

Let's Teach Ali about using the Command Line Interface.  
Tell Ali about the drives in the Computer System.



These are drives and store data. Every Driver has a unique Letter as you can see in the picture Letter C, D and E

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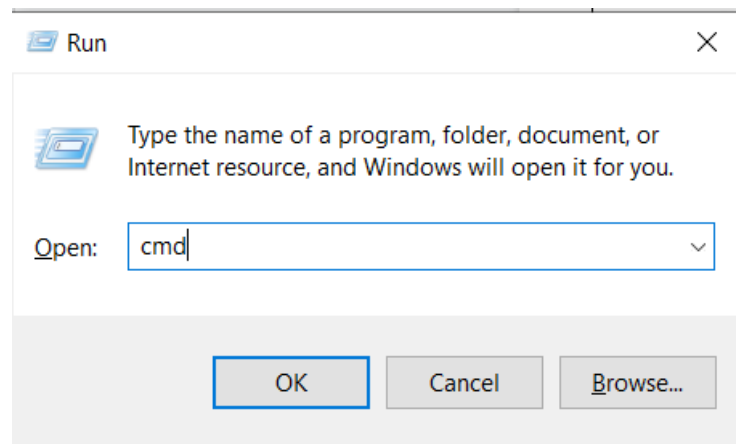
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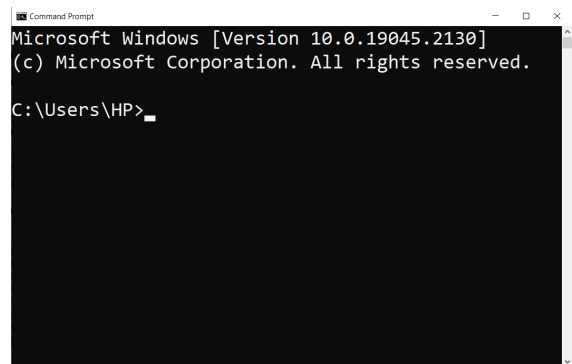
To open the CLI in your computer Press **Windows + R** (It means to keep pressing the windows button and then press the **R** button from the keyboard and release the buttons)



Write the **cmd** keyword in the run and **press OK** or hit **Enter Button** from the keyboard.



It will appear the CMD on the screen as you can see in the picture



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Write the Drive letter and Colon and hit the Enter button.  
For example, I want to access drive D so I write **D:** and **press enter**.

```
Microsoft Windows [Version 10.0.19045.2130]
(c) Microsoft Corporation. All rights reserved.

C:\Users\HP>D:

D:\>
```

To see the available files inside any folder or drive use the **dir** command.

Hint: The **dir** command is used to display all the available folders and files inside a folder.

```
Microsoft Windows [Version 10.0.19045.2130]
(c) Microsoft Corporation. All rights reserved.

C:\Users\HP>D:

D:\>dir

Volume in drive D has no label.
Volume Serial Number is 7CAF-BE14

Directory of D:\

11/08/2022  10:40 AM  <DIR>          Codes
08/10/2022  01:39 PM  <DIR>          iVMS-4200alarmPicture
11/24/2022  09:11 AM  <DIR>          Movies
08/03/2022  10:59 AM  <DIR>          MyData
11/02/2022  01:14 PM  <DIR>          Recordings
09/13/2022  11:30 PM  <DIR>          recovered data
10/26/2022  11:23 PM  <DIR>          Softwares
01/12/2022  08:25 AM  <DIR>          Studies
11/22/2022  02:45 PM  <DIR>          UET Files
               0 File(s)              0 bytes
               9 Dir(s) 198,117,728,256 bytes free

D:\>
```

There is too much text on the console screen. Help Ali to remove all this text from the screen.

Hint: To clear all the stuff there is command **cls**.  
Clear screen.  
Write **cls** and **press Enter**. It will clear the CLI screen.

```
D:\>
```

Before creating your folder first see the location

```
Microsoft Windows [Version 10.0.19045.2130]
(c) Microsoft Corporation. All rights reserved.

D:\>
```

This Path refers to your location.  
If this is D, it means you are currently in D Folder.

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Now, tell Ali to create the folder with CLI.

Hint: **mkdir** command is used to create a folder

Syntax: **mkdir Folder name**

Command Prompt

```
D:\>mkdir study
```

```
D:\>
```

Great Work, You have created a new Folder using CLI.  
Now, navigate to the study folder using the CLI.

Hint: To navigate between folders use the command **cd**  
stands for change directory.

Syntax: **cd folder name**

Command Prompt

```
D:\>mkdir study
```

```
D:\>cd study
```

```
D:\study>
```

You are doing an excellent job teaching Ali about  
navigating through folders.

See that now we are in folder **study**

Command Prompt

```
D:\>mkdir study
```

```
D:\>cd study
```

```
D:\study>
```

Let's make three folders in this folder using the mkdir  
command.

Write the following commands to create three folders  
with names mentioned in CLI.

Command Prompt

```
D:\study>mkdir programming
```

```
D:\study>mkdir I2C
```

```
D:\study>mkdir English
```

```
D:\study>
```

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Let's use the dir command to check the created folders.

```
D:\study>dir
Volume in drive D has no label.
Volume Serial Number is 7CAF-BE14

Directory of D:\study

11/25/2022  09:20 AM  <DIR>          .
11/25/2022  09:20 AM  <DIR>          ..
11/25/2022  09:20 AM  <DIR>          English
11/25/2022  09:20 AM  <DIR>          I2C
11/25/2022  09:20 AM  <DIR>          programming
               0 File(s)              0 bytes
               5 Dir(s) 198,117,728,256 bytes free

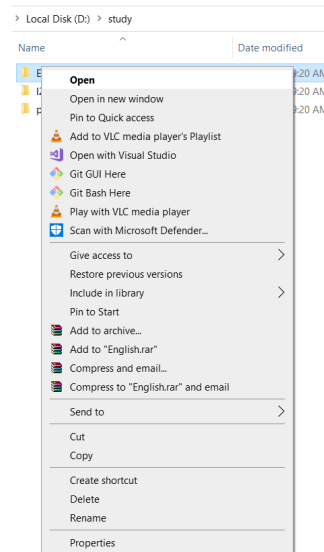
D:\study>
```

Great Work, You have helped Ali to Open, create, and navigate through folders using both GUI and CLI.

Ali's friend told him they are not studying English this semester. So he does not need an English folder, he wants to **delete it**. Let's Help Ali to delete the folder with both techniques

**Right click** on the folder you want to delete and choose the **delete** option from the list.

This will delete the folder from the storage.



Let's learn to delete the folder with CLI.

**Warning:** Before deleting the folder make sure you are in the right folder.

We want to delete the folder that is available in the study folder so make sure the **folder path** is on CLI.

```
Command Prompt
Microsoft Windows [Version 10.0.19045.2130]
(c) Microsoft Corporation. All rights reserved.

C:\Users\HP>D:

D:\>cd study

D:\study>
```

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Once you are in the correct folder, delete the folder using CLI.

Hint: **rmdir** command is used to remove/delete the folder.

Syntax: **rmdir Folder name**

```
Microsoft Windows [Version 10.0.19045.0]
(c) Microsoft Corporation. All rights reserved.

C:\Users\HP>D:

D:\>cd study

D:\study>rmdir English

D:\study>
```

Now use the **dir** command to counter-check whether the English folder has been deleted.

```
D:\study>dir
Volume in drive D has no label.
Volume Serial Number is 7CAF-BE14

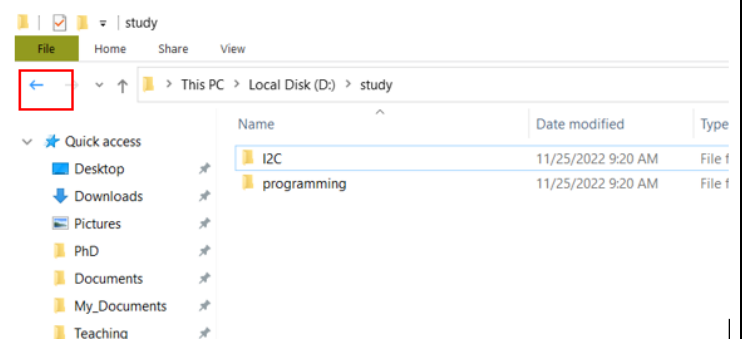
Directory of D:\study

11/25/2022  09:32 AM    <DIR>        .
11/25/2022  09:32 AM    <DIR>        ..
11/25/2022  09:20 AM    <DIR>        I2C
11/25/2022  09:20 AM    <DIR>        programming
               0 File(s)              0 bytes
               4 Dir(s)  198,117,728,256 bytes free

D:\study>
```

Great Work People, You have helped Ali in creating and deleting folders. Let's help him in navigating to the **previous directory** using both methods.

Using the GUI, You can navigate to the previous directory by clicking on the back arrow at the top on Window Explorer.



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To go back to the folder in CLI use double dots with the cd command.

Syntax: **cd ..** (it will move you back one step)

```
D:\study>cd ..
```

```
D:\>
```

Ali wants to make notes for every subject inside the computer. He needs a text file for that. Let's help him to create a text file and write some notes.

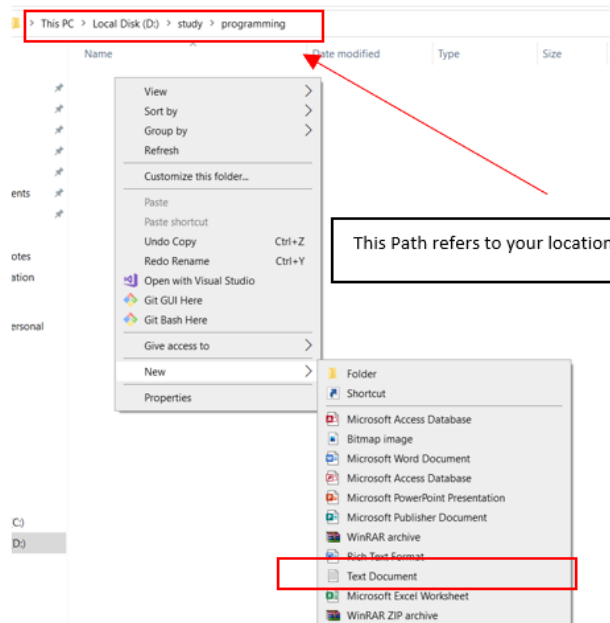
Using GUI:

Navigate to the folder where you want to create the file. Ali has a Programming assignment so help him to make a file in the programming folder.

Using your previous knowledge, move to the programming folder and click on black space.

**Instruction:** Create a new notepad file named as “My Notes”.

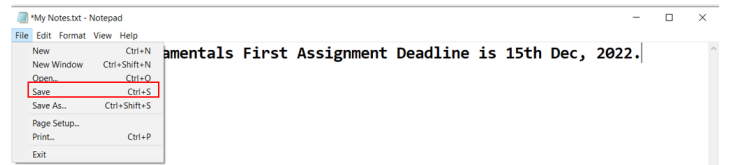
My Notes.txt



Help Ali in Opening the file by double-clicking on it and writing the desired text in the file.

My Notes.txt - Notepad  
File Edit Format View Help  
Programming Fundamentals First Assignment Deadline is 15th Dec, 2022.

Save the changes in the file by Selecting **File > Save** or Pressing **Ctrl+S** from the keyboard.



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Let's do the same with CLI but in the I2C folder.

Instruction: Use the knowledge learned to navigate to the I2C Folder.

```
Command Prompt
D:\study\I2C>
```

Let's help Ali in Creating and Writing into a NotePad File.

Hint: **echo** and then write any text you want inside your document. At the end write **>documentname.txt**

Syntax: echo "sample text" > filename.txt

```
Command Prompt
D:\study\I2C>echo "I2C Assignment Deadline is 17th Dec 2022." > I2CNotes.txt
D:\study\I2C>
```

Let's check if the file has been created with the dir command.

```
D:\study\I2C>dir
Volume in drive D has no label.
Volume Serial Number is 7CAF-BE14

Directory of D:\study\I2C

11/25/2022  10:00 AM    <DIR>          .
11/25/2022  10:00 AM    <DIR>          ..
11/25/2022  10:00 AM                46 I2CNotes.txt
               1 File(s)                46 bytes
               2 Dir(s) 198,117,728,256 bytes free

D:\study\I2C>
```

Let's help Ali in checking the contents of the created file using CLI.

Hint: type filename.txt is used to write the contents of the file to the console screen.

```
D:\study\I2C>type I2CNotes.txt
"I2C Assignment Deadline is 17th Dec 2022."
D:\study\I2C>
```

Let's Help Ali in Copying and Moving Files between Directories.

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Help Ali to Copy a File My Notes.txt from Programming to I2C Folder.

Hint: **copy** command is used to copy a file from one directory to other.

Syntax: **copy sourcefile DestinationLocation**

```
Microsoft Windows [Version 10.0.19045.2130]
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C:\Users\HP>D:

D:\>cd Study

D:\study>cd programming

D:\study\programming>copy "My Notes.txt" D:\study\I2C\
1 file(s) copied.

D:\study\programming>
```

Now Help Ali to Move the File My Notes.txt from I2C Folder to the root folder (Study).

Hint: **move** command is used to copy a file from one directory to other.

Syntax: **move sourcefile DestinationLocation**

```
Microsoft Windows [Version 10.0.19045.2130]
(c) Microsoft Corporation. All rights reserved.

D:\study\programming>cd ..

D:\study>cd I2C

D:\study\I2C>move "My Notes.txt" D:\Study\
1 file(s) moved.

D:\study\I2C>
```

Similarly, you can use both commands by providing the location of source and destination files respectively.

```
Microsoft Windows [Version 10.0.19045.2130]
(c) Microsoft Corporation. All rights reserved.

D:\>move D:\study\I2C\I2CNotes.txt D:\study
1 file(s) moved.

D:\>
```

**Great Job Guys, You have helped Ali in developing an understanding of Computer Interfaces.**

### Conclusion:

Command	Description
dir	list all the directories in the current directory
cd ..	go back a directory
cd /	go to the root of the directory

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<code>mkdir</code> “newfile.extension”	create a new directory
<code>rmdir</code> “filetoberemoved.extension”	remove a directory
<code>copy</code> sourcefileLocation Target	Copies file from source to target directory
<code>move</code> sourcefileLocation Target	Moves file from source to target directory
<code>move</code> *.txt Target	Moves all txt files from the current directory to Target directory
<code>move</code> filename newfilename	This will rename the file in the same directory
<code>del</code> filename.fileextension	This will delete the file from the directory
<code>echo</code> This is a sample statement > filename.extension	Creates and Writes to a .txt (Notepad) file
<code>type</code> “filename.extension”	Used to display the contents of a file
<code>exit</code>	It is used to Exit the Command Prompt Window

## Task 02(OP):

### Lab Task using CLI

1. Using the commands listed above, which you have read out and practiced in the lab.
2. Create the following structure on your home directory. The **Square boxes are folders**, while the **lines represent folders contained inside each one**. As can be seen in the diagram below, the structure looks like a hierarchy and this is what the use of folders provides for – a hierarchy of where data should be saved and stored.

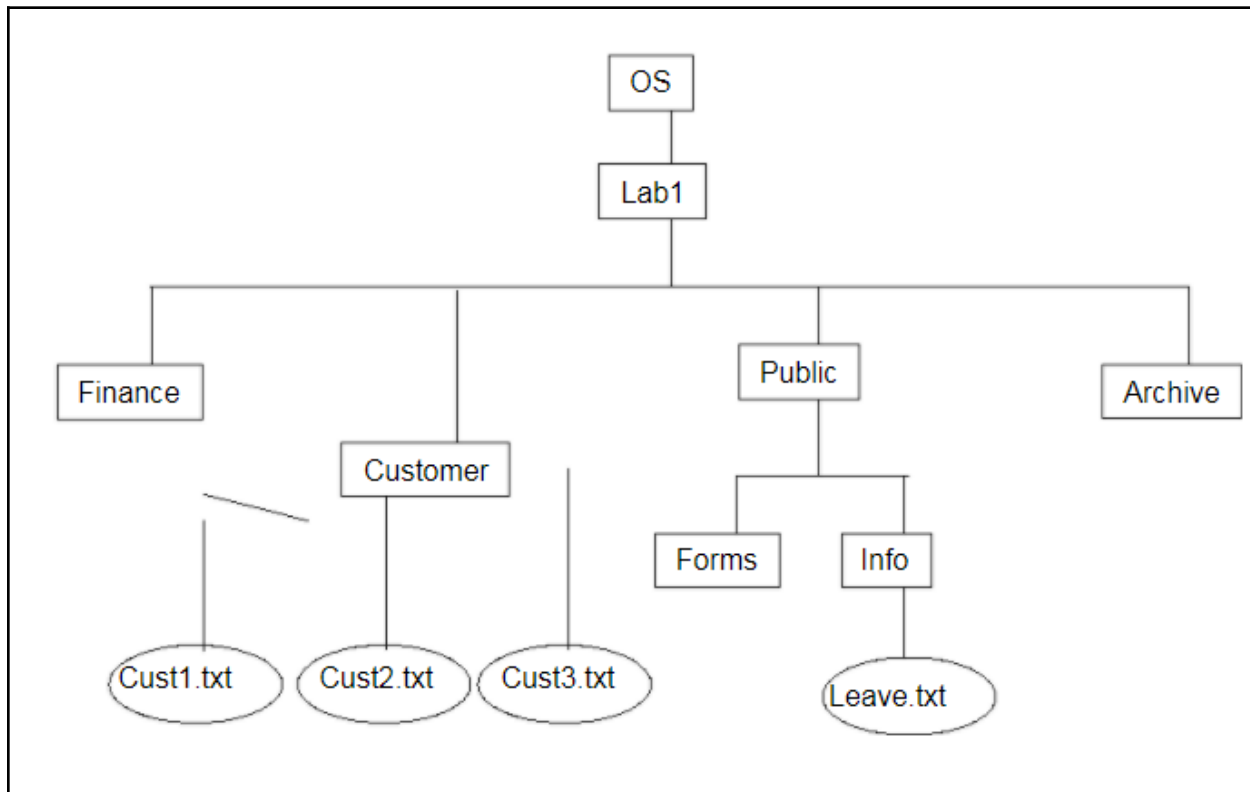
Before you start, using any application you like (e.g. Notepad), **create three text files**: cust1.txt; cust2.txt and cust3.txt and **two documents leave.txt**. These should be created and saved at **the top/root of your home directory**. Now, using the windows command prompt only, implement the following folder structure.

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Now that you have created the directory structure, write the commands that control it in the following ways (3 – 12).

3. Move the **three customer files** to the **Customer directory**.
4. **Copy** the three customer files to the **Archive directory** using a single command.
5. **Move** the file **leave.txt** to the **archive directory** and **rename** it **leave\_old.txt**.
6. Place **leave\_old.txt** in the **Forms directory**.
7. **Change** to the **Customer directory** and **check** that it contains the three customer files.
8. **Change** to the **Archive directory** and **check** it contains the three customer files that you copied.
9. **Change back** to the **Customer directory** and **delete** the three customer files.
10. **Display the contents** of the text files in the command prompt window **one at a time**.
11. **Clear the screen**.
12. **Exit** the command prompt window.

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**Good Luck and Best Wishes !!**

**Happy Coding ahead :)**