Introduction to Operating System, File System, and Command Prompt
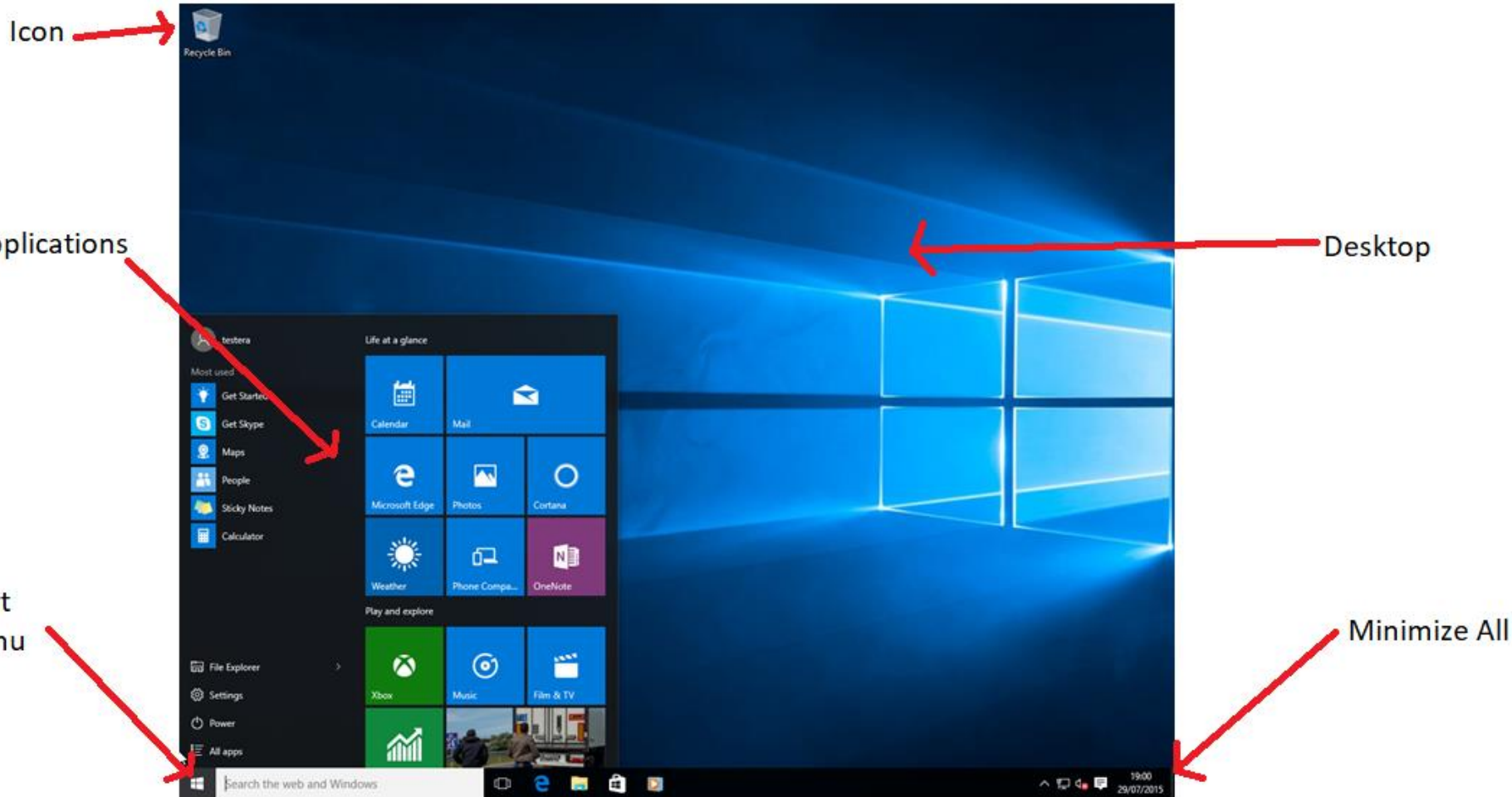
Instructor: Dr. Rahul Thakur

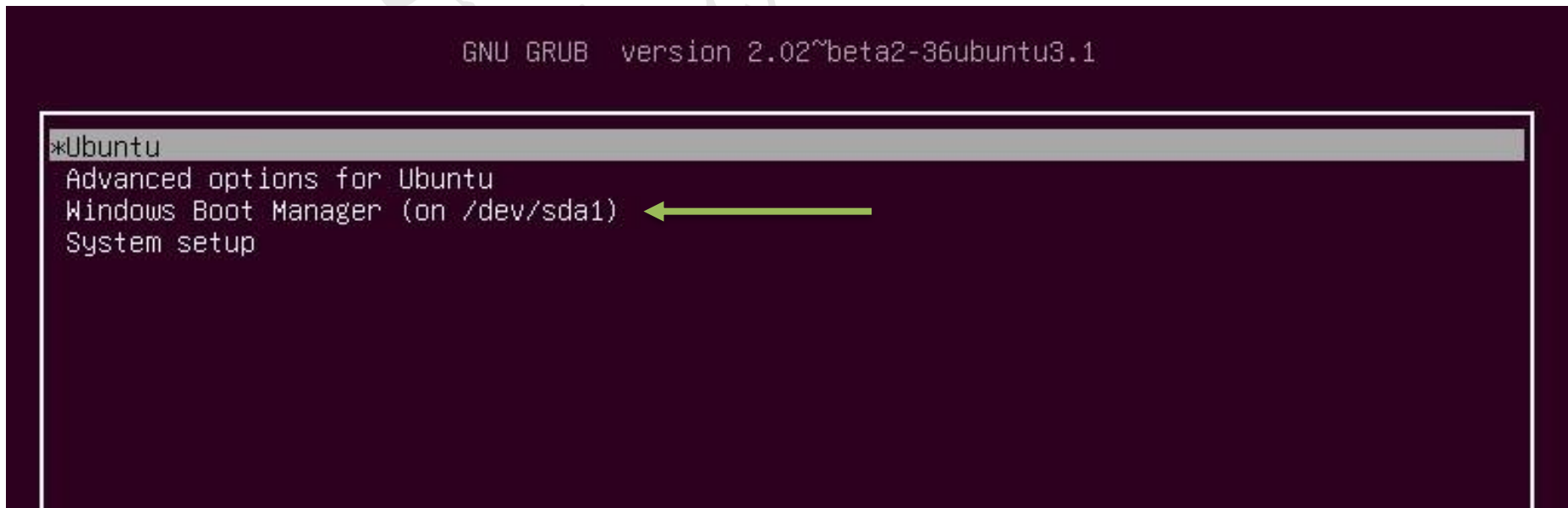Assistant Professor, Computer Science and Engineering, IIT Roorkee

A Computer System

- **Hardware:** CPU, monitor, keyboard, mouse…
- **Software:**

  - **Operating System:** Windows, Linux, Solaris, Android..

  - **Applications:** Media players, editors, photo editing applications, programming applications…

- **Operating System:** An operating system (OS) is system software that manages computer hardware and software resources and provides common services for computer programs

  - It is a software that allows a user to run other applications on a computing device

Windows 10: First Look

Multi-Boot System

- A computer system can have more than two operating systems
  - In Labs: Windows 7 or 10 and Ubuntu (Linux)
- GRUB menu
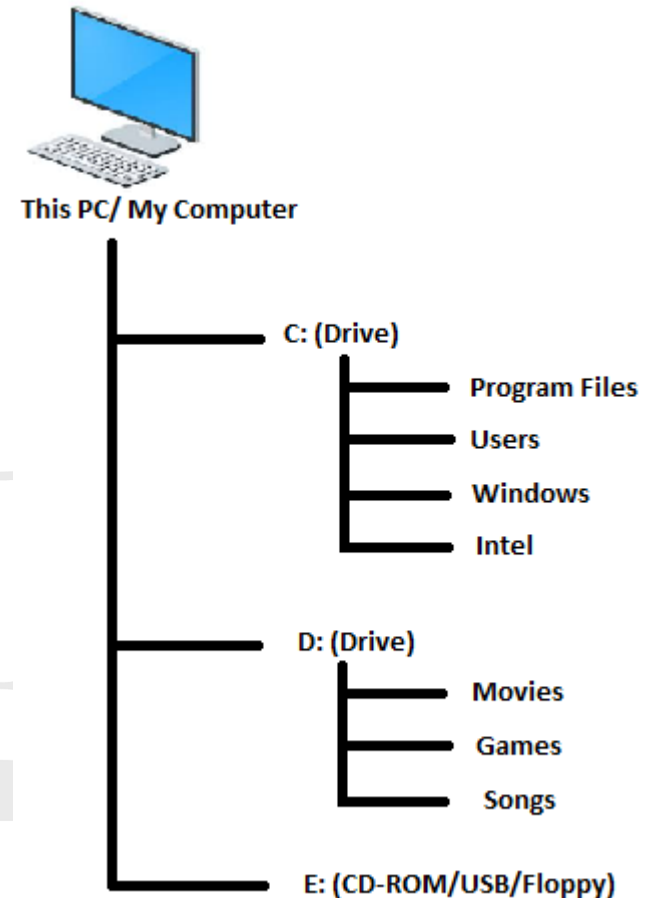 - To choose which operating system to start

```
GNU GRUB   version 2.02~beta2-36ubuntu3.1

*Ubuntu
 Advanced options for Ubuntu
 Windows Boot Manager (on /dev/sda1)   ⬅
 System setup
```

Files

- **File:** A named collection of related information stored on secondary storage (such as Hard Disk, Pen drive, SD Card..)
  - Basic unit of information storage
- **File Attributes:** Name, size, location, permission, creation time, modification time…
- **File Operations:** Create, open, read, append/edit, delete..
- **File Extensions:** A string of characters attached to a filename, usually preceded by a full stop and indicating the format of the file
  - .txt   Text File
  - .jpeg   Picture/Image File
  - .avi   Video File
  - .java   Java source code file

Folders/Directories

- **Folder:** A folder is a storage space where files (and even folders) can be placed into groups and organize the computer
  - It is a way to organize computer files.
  - Hierarchical structure

This PC/ My Computer

C: (Drive)
- Program Files
- Users
- Windows
- Intel

D: (Drive)
- Movies
- Games
- Songs

E: (CD-ROM/USB/Floppy)

Path

- In a computer operating system, a Path is the route through a file system to a particular file/folder
  - In Windows

Delimiter

C:\Users\Rahul

Drive
Letter
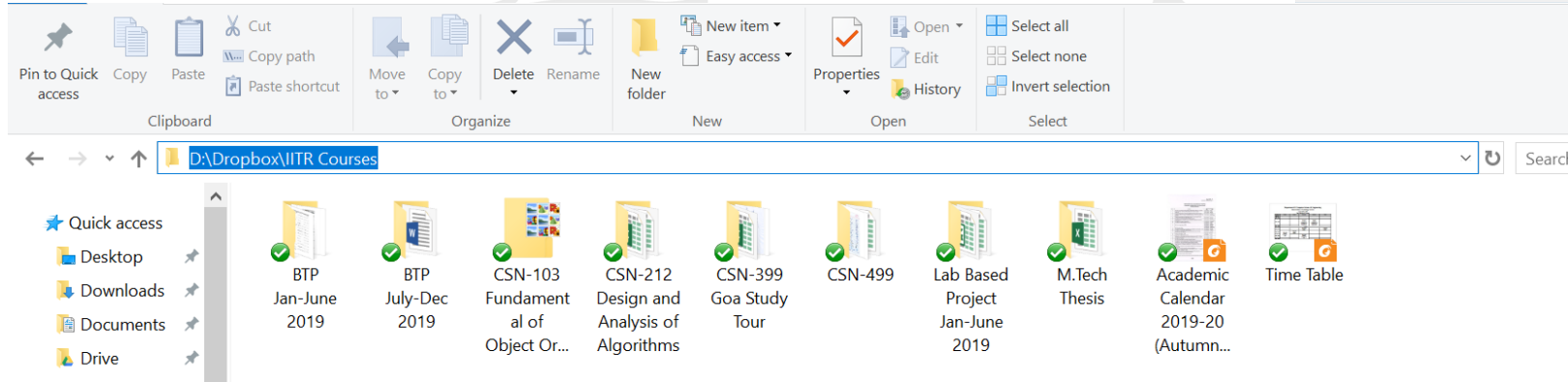Folder
Folder
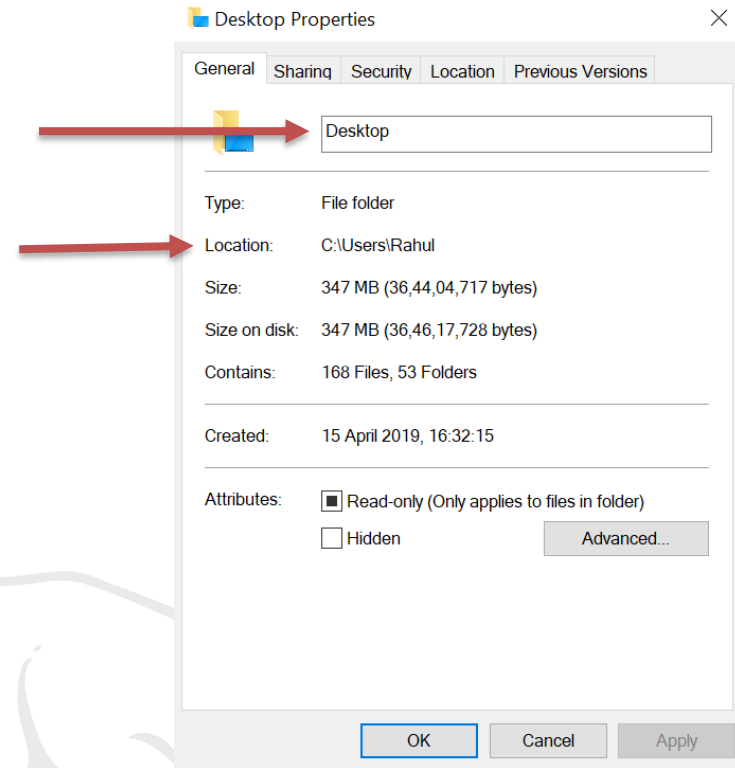
Delimiter

/home/Rahul/OOP

root

Folder
Folder
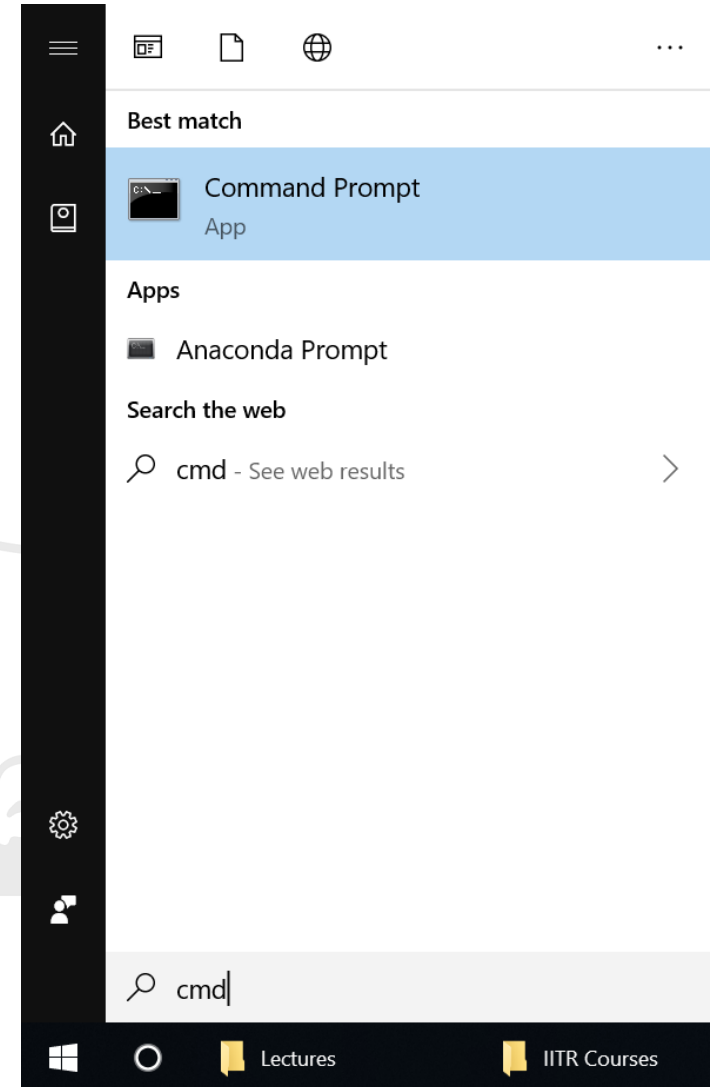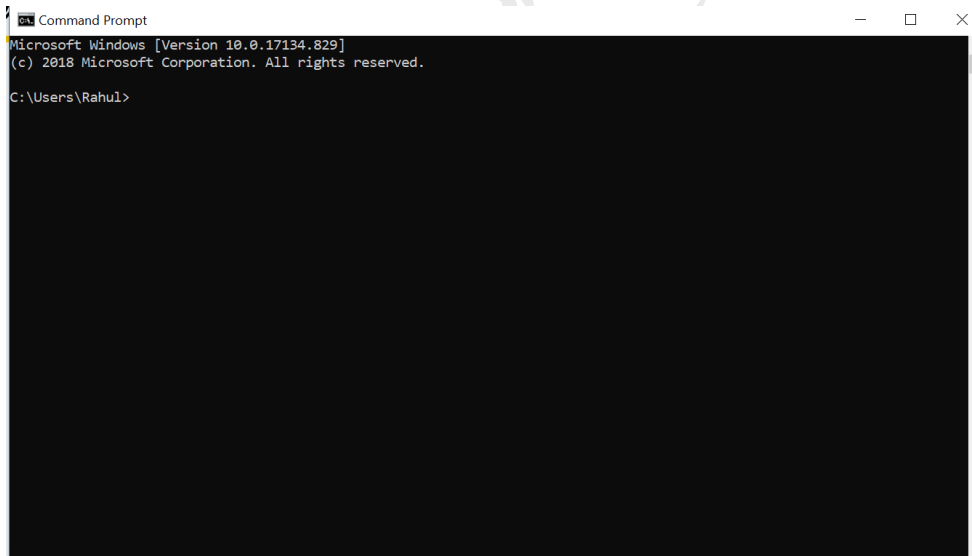Folder

Finding a File/Directory Path

- ## Windows
  - Identify the file\directory
  - Right Click → Properties
  - Location

  OR

  - Click on the Address Bar
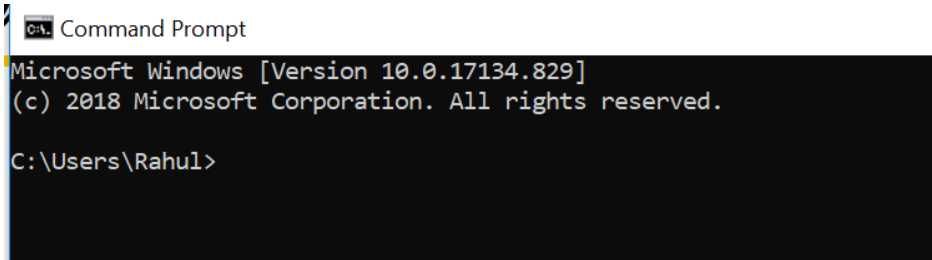
  C:\Users\Rahul\Desktop

Command Prompt

- In the beginning of the time: Disk Operating System (DOS)
- It is the command-line interface
- Every Windows OS has a Command Prompt

Command Prompt Basics

- Current Working Directory
  - By default: User home directory

  - All commands executed in the current working directory by default
  - To know current working directory
    - Type   cd

    OR

    - Observe the prompt
                C:\Users\Rahul   >

Basic Commands

- dir
  - Used to display a list of the files and subfolders contained in a folder

Command	Operation
dir	Display a list of the files and subfolders
dir <path>	Display a list of the files and subfolders for the directory specified by the path

- **Change the drive letter if necessary**

  C:\Users\Rahul>cd D:\Data\Pics

  C:\Users\Rahul>

  C:\Users\Rahul>D:

  D:\Data\Pics>


```
C:\Users\Rahul>dir
 Volume in drive C is Windows
 Volume Serial Number is 5E9A-5847

 Directory of C:\Users\Rahul

01-08-2019  12:05    <DIR>          .
01-08-2019  12:05    <DIR>          ..
19-04-2019  19:32    <DIR>          .dia
23-05-2019  00:48    <DIR>          .eclipse
23-05-2019  00:48    <DIR>          .p2
23-05-2019  00:48    <DIR>          .tooling
11-07-2019  20:52    <DIR>          3D Objects
11-07-2019  20:52    <DIR>          Contacts
02-08-2019  10:03    <DIR>          Desktop
11-07-2019  20:52    <DIR>          Documents
16-04-2019  00:04    <DIR>          Downloads
23-05-2019  00:26    <DIR>          eclipse
23-05-2019  00:53    <DIR>          eclipse-workspace
01-08-2019  12:08               427 Example.class
01-08-2019  12:08               184 Example.java
11-07-2019  20:52    <DIR>          Favorites
11-07-2019  20:52    <DIR>          Links
11-07-2019  20:52    <DIR>          Music
11-07-2019  20:18    <DIR>          OneDrive
27-07-2019  12:25    <DIR>          Pictures
15-04-2019  16:50    <DIR>          Roaming
11-07-2019  20:52    <DIR>          Saved Games
11-07-2019  20:52    <DIR>          Searches
11-07-2019  20:52    <DIR>          Videos
               2 File(s)            611 bytes
              22 Dir(s)  54,610,927,616 bytes free

C:\Users\Rahul>
```

Basic Commands

- cd (Change Directory)

Command	Operation
cd	Displays current working directory
cd <path>	Change current working directory as the Path
cd..	Parent directory/One folder up

- Other Commands
  - mkdir : Creating a new directory
  - del : Deleting a file or directory
  - ping : To verify that a computer can communicate over the network with another computer or network device

Shortcuts

- Copy and Paste
  - Ctrl+c : Copy Text
  - Ctrl+v : Paste Text
  - If Disabled (^V or ^C): Enable by Right Clicking the Command Prompt → Properties → Check Enable ctrl key shortcuts

- Tab
  - Auto-complete the path
  - Indentation in programs

- PrtSc
  - Print screen: Takes a snapshot and keep it in the buffer
  - Can be pasted and saved using Paint

References

- http://www.cs.utexas.edu/users/witchel/372/lectures/18.FileSystems-Fundamentals.pdf

- Stallings,"Operating Systems: Internals and Design Principles", Pearson: Prentice Hall

- https://docs.microsoft.com/en-us/windows-server/administration/windows-commands/windows-commands