DAY 3

OPERATING SYSTEM

SYSTEM SOFTWARE

System Software:

- Purpose: System software acts as an intermediary between the hardware and application software. It manages and controls the hardware components, enabling communication and coordination between hardware and software.
- Examples: Common examples of system software include operating systems (e.g., Windows, macOS, Linux), device drivers (software that allows hardware devices to communicate with the operating system), and utility programs (e.g., antivirus software, disk management tools, and system maintenance utilities).
- Function:
  - Operating System (OS): The primary system software, the operating system, manages resources such as CPU, memory, storage, and input/output devices. It provides essential services like process management, memory management, file system management, and user interface.
  - Device Drivers: These are software modules that facilitate communication between the OS and specific hardware devices (e.g., printer drivers, graphics card drivers).
  - Utility Programs: Utilities help users manage and maintain their computer systems, including tasks like disk cleanup, data backup, and system optimization.

APPLICATION SOFTWARE

- Purpose: Application software, also known as apps or programs, is designed for specific tasks or applications that meet user needs. It allows users to perform various functions and tasks, such as word processing, spreadsheet calculations, web browsing, gaming, and more.

- Examples: Application software encompasses a wide range of programs, including word processors (e.g., Microsoft Word), spreadsheet software (e.g., Microsoft Excel), web browsers (e.g., Google Chrome), multimedia players (e.g., VLC), video games, graphic design software (e.g., Adobe Photoshop), and productivity apps (e.g., email clients, project management tools).

- Function: Application software is task-oriented and designed to perform specific functions or processes. Users interact directly with application software to complete tasks, create content, or achieve specific goals. Each application software serves a particular purpose and often includes user-friendly interfaces tailored to the task it addresses.

KEY DIFFERENCES

- **Purpose**: System software manages and facilitates the operation of hardware and software components, while application software serves specific user-oriented tasks and applications.
- **Interaction**: Users interact directly with application software to accomplish tasks, whereas system software operates in the background and is typically not directly accessed by users.
- **Examples**: System software includes the operating system, drivers, and utility programs. Application software includes word processors, games, web browsers, and other task-specific programs.
- **Scope**: System software is essential for the functioning of the entire computer system, while application software is focused on providing tools and features for specific user needs.

In summary, system software and application software work together to enable the functionality of a computer system. System software manages the underlying infrastructure and resources, while application software provides tools and features for users to perform various tasks and applications.

OPERATING SYSTEMS

There are various operating systems designed for different types of computing devices and purposes. Here are some examples of popular operating systems categorized by device or use:

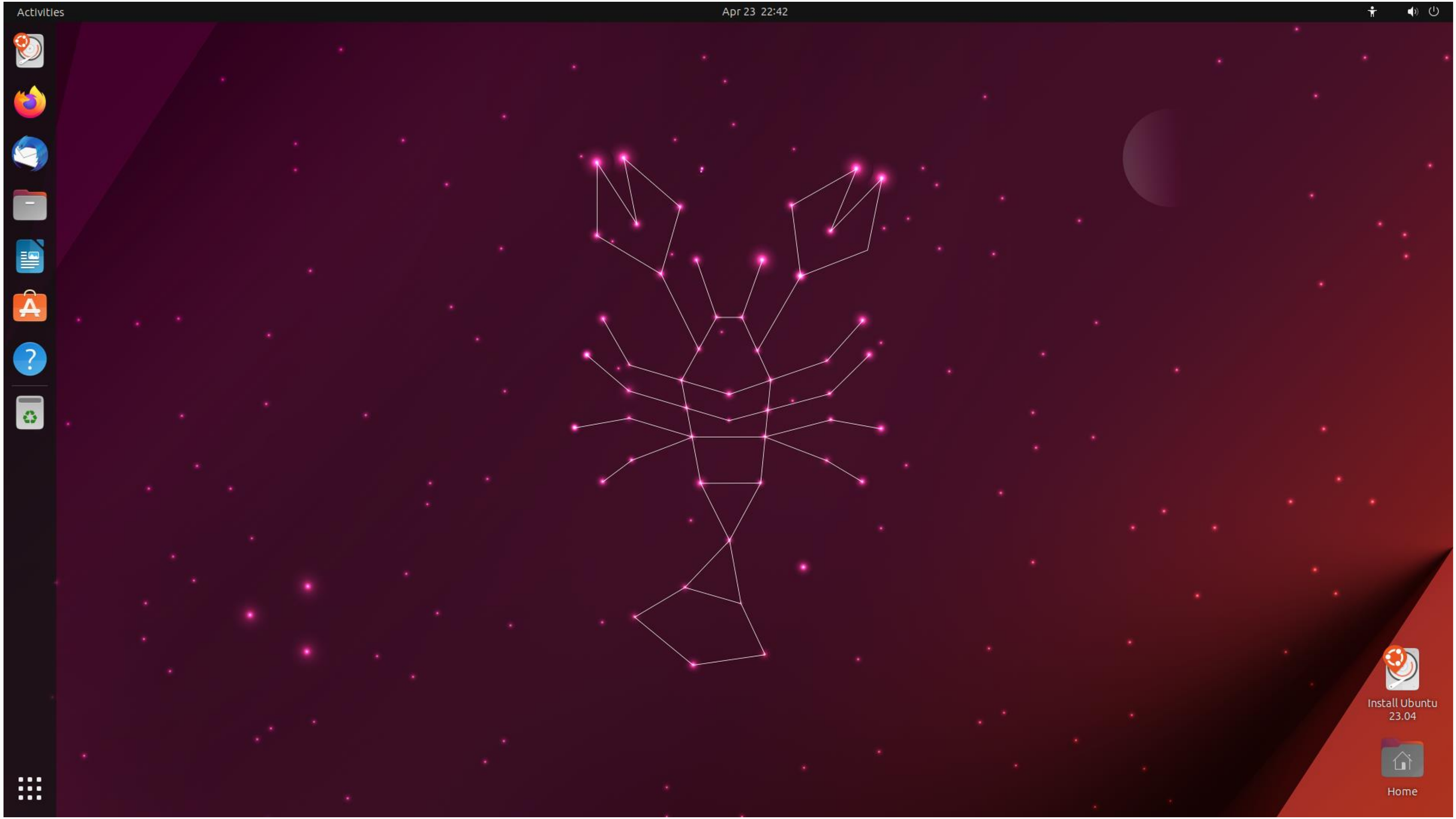
Desktop and Laptop Operating Systems:

- Microsoft Windows: A widely used operating system for personal computers. Versions include Windows 10 and Windows 11.
- Apple macOS: The operating system for Apple Macintosh computers. Recent versions include macOS Big Sur and macOS Monterey.
- Linux: A family of open-source operating systems available in various distributions (distros), such as Ubuntu, Fedora, and Debian. Linux is commonly used on desktops and servers.

Windows 11 Desktop

A – Wallpaper
B – Start Menu
C – Taskbar
D – Search
E – Icons / Apps
F – Power Options

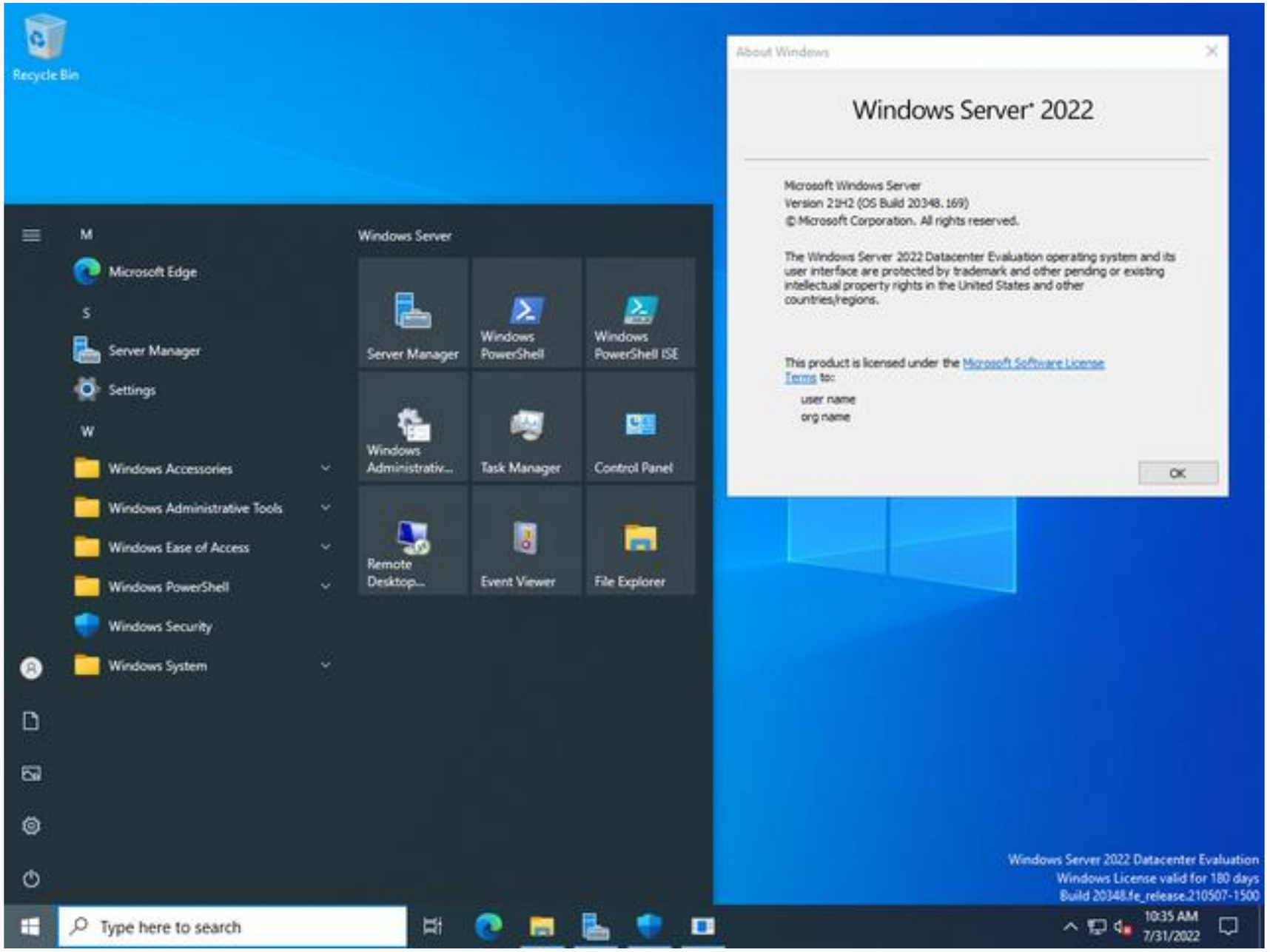

Shortcuts File Edit Shortcut View Window Help
Mon Jun 7 9:41 AM
Gallery
Gallery
All Shortcuts 18
Menu Bar 2
Quick Actions 2
Media 3
Photos 4
Starter Shortcuts 4
Kitchen Tunes 1
Shortcuts for macOS
The world's most advanced desktop operating system
Siri Games
Have fun with shortcuts designed for Siri
macOS meets
Get Stuff Done
Shortcuts to help you focus on your Mac
See All
Stop Distractions
Batch Add Reminders
Make Meme
Turn Text Into Audio
Get Organized
Organize your desktop, your Mac, and everything else
See All
Sort Lines
Split Screen 2 Apps
How Many Days Until
Organize Downloads Folder
MacBook Pro


Activities
Apr 23 22:42
Install Ubuntu 23.04
Home

Server Operating Systems

Windows Server: A server-specific version of the Windows operating system used in enterprise environments.

Linux Server: Linux distributions like CentOS, Ubuntu Server, and Red Hat Enterprise Linux are popular choices for server deployments due to their stability and flexibility.


Recycle Bin
M
Microsoft Edge
S
Server Manager
Settings
W
Windows Accessories
Windows Administrative Tools
Windows Ease of Access
Windows PowerShell
Windows Security
Windows System
Windows Server
Server Manager
Windows PowerShell
Windows PowerShell ISE
Windows Administrativ...
Task Manager
Control Panel
Remote Desktop...
Event Viewer
File Explorer
Type here to search
10:35 AM
7/31/2022

About Windows
Windows Server 2022
Microsoft Windows Server
Version 21H2 (OS Build 20348.169)
© Microsoft Corporation. All rights reserved.
The Windows Server 2022 Datacenter Evaluation operating system and its user interface are protected by trademark and other pending or existing intellectual property rights in the United States and other countries/regions.
This product is licensed under the Microsoft Software License Terms to:
user name
org name
OK

Windows Server 2022 Datacenter Evaluation
Windows License valid for 180 days
Build 20348.fe_release.210507-1500


Activities
Applications
Places
05:41
Type to search...
Boxes
Brasero
Cheese
Evolution
Files
Firefox
HexChat
LibreOffice C...
LibreOffice D...
LibreOffice I...
LibreOffice M...
LibreOffice ...
Rhythmbox
SELinux Trou...
Settings
Smart Card ...
Software
Text Editor
TigerVNC Vie...
Utilities
Videos
Frequent
All

Mobile Operating Systems:

Android: Developed by Google, Android is the dominant operating system for smartphones and tablets.

iOS: Developed by Apple, iOS is the operating system exclusively used on iPhones, iPads, and iPod Touch devices.

Functions of Operating Systems

Process Management

- **Process Scheduling**: The OS manages multiple processes, determining which ones run, how long they run, and in what order.
- **Process Communication**: Facilitates communication and data exchange between processes.
- **Process Synchronization**: Ensures orderly access to shared resources to prevent conflicts and data corruption.

Memory Management

- **Allocation and Deallocation**: Allocates memory to running processes and deallocates memory when it's no longer needed.
- **Virtual Memory**: Manages a combination of physical RAM and disk space to increase the effective memory available to applications.

Functions of Operating Systems

File System Management

- **File Creation, Access, and Deletion**: Provides an interface for creating, accessing, and deleting files and directories.
- **File Permissions and Security**: Enforces access control and security policies for files and directories.

Functions of Operating Systems

I/O Device Management

- **Device Drivers**: Manages device drivers to enable communication between the OS and hardware devices.
- **Buffering and Caching**: Optimizes data transfer between memory and I/O devices for efficiency.
- **Interrupt Handling**: Manages hardware interrupts generated by devices.

User Interface

- **Graphical User Interface (GUI):** Provides a visual interface for users to interact with the computer, including windows, icons, menus, and pointers (WIMP).
- **Command-Line Interface (CLI):** Allows users to interact with the OS and execute commands through text-based interfaces.

DOS COMMANDS

DOS, which stands for "Disk Operating System," is a family of operating systems that were prevalent during the early days of personal computing. MS-DOS (Microsoft Disk Operating System) and PC-DOS (IBM's version) are two well-known examples of DOS. These operating systems primarily used a command-line interface for interacting with the computer

Command	Description
`DIR`	Lists files and directories in the current directory.
`CD`	Changes the current directory (e.g., `CD C:\Folder`).
`MD` or `MKDIR`	Creates a new directory (e.g., `MD NewFolder`).
`RD` or `RMDIR`	Removes a directory (e.g., `RD OldFolder`).
`COPY`	Copies files from one location to another.
`DEL` or `ERASE`	Deletes files (e.g., `DEL FileName.txt`).
`REN` or `RENAME`	Renames files or directories (e.g., `REN OldFile.txt NewFile.txt`).
`CLS`	Clears the screen.
`TYPE`	Displays the contents of a text file (e.g., `TYPE File.txt`).
`EXIT`	Exits the MS-DOS/PC-DOS command prompt.

Functions of Operating Systems

Security and Access Control:

- **User Authentication**: Controls access to the system by requiring users to log in.
- **Access Control Lists (ACLs) and Permissions**: Defines who can access and modify files, directories, and system resources.
- **Firewalls and Intrusion Detection**: Protects the system from unauthorized access and cyber threats.

Networking

- **Network Protocols:** Manages network connections and communication protocols, enabling connectivity over local and wide-area networks.
- **Network Services:** Provides services like file sharing, printing, and internet access.

Functions of Operating Systems

Error Handling and Logging

- **Error Detection and Recovery**: Identifies and handles errors to prevent system crashes.
- **Event Logging**: Records system events and errors for diagnostic and troubleshooting purposes.

Components of Operating Systems

Kernel:
The core of the operating system that manages essential tasks like process scheduling, memory management, and device control.

Shell:
The user interface to the operating system, responsible for interpreting user commands (CLI) or providing a graphical interface (GUI).

Device Drivers:
Software components that facilitate communication between the OS and hardware devices, such as printers, graphics cards, and storage devices.

File System:
Manages the organization and storage of files and directories on storage devices.

Components of Operating Systems

Utilities:
Auxiliary programs and tools that help users manage and maintain the system, including disk utilities, text editors, and system monitoring tools.

APIs (Application Programming Interfaces):
Sets of functions and procedures that allow application software to interact with the OS and hardware resources.

Libraries:
Collections of precompiled code and routines that can be used by application developers to simplify programming tasks.

Windows 10 Shortcuts

Task Manager	Alt + Ctrl + Del OR Ctrl + Shift + Esc
Open Run Command	Win + R
Rename	F2
Delete Folder / File Permanently	Shift + Del
Select All	Ctrl + A
Copy	Ctrl + C
Paste	Ctrl + V
Cut	Ctrl + X
Screenshot Tool	Win + Shift + S
Save	Ctrl + S
Close Programme	Alt + F4
Minimize All Window	Win + M
Toggle Through Apps	Alt + Tab
Lock PC	Win + L
Refresh	F5