



# جامعة بوليتكنك فلسطين



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## CHAPTER THREE

### COMPUTER SOFTWARE

#### **PREFACE:**

*This chapter focuses on computer software and the capabilities of computer programs that turn computers to operate effectively to users. It differentiates between the two essential types of software: system software and application software, while giving thorough samples on each type. The chapter also covers the operating system as a key system software, and it covers its main functions. The chapter also looks at utility programs that perform maintenance operations on a computer.*

#### **INTENDED LEARNING OUTCOMES:**

After completing this chapter students will be able to:

- 1) Describe the differences between system software and application software.
- 2) Understand what application software is, and provide examples about it.
- 3) Explain the basic functions, features, and categories of operating systems.
- 4) Name today's most widely used operating systems.
- 5) Explain the purpose of utilities and utility suites.

#### **FURTHER READING:**

- 1) Discovering Computers ©2018: Digital Technology, Data, and Devices.
- 2) Computing Essentials 2017-McGraw-Hill (2017) Daniel O'Leary, Linda I. O'Leary, Timothy J O'Leary.
- 3) Understanding Computers Today And Tomorrow Comprehensive, Deborah Morley, Charles S. Parker - Cengage Learning, (2016).

## WHAT IS COMPUTER SOFTWARE

- A *computer software* (or program, application) is the set of instructions that tell the computer what to do, and how to process data to get what the user wants.
- Computer software drives the hardware to operate properly.
- Types of Software:
  - Application Software
  - System Software

### Application Software:

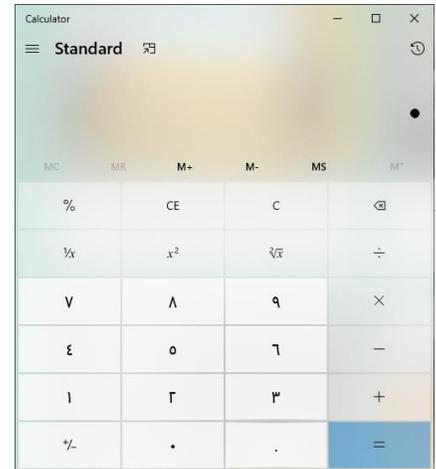
- Performs a specific task, and provides a service to the end user.
- The user interacts with the application software.
- Examples of application software:
  - Google Chrome: Web browsing.
  - Notepad: Text editing.
  - Media Player: Audio playing.
  - MS Excel: Spreadsheet Application.
  - MS PowerPoint: Presentation Software.
  - Photoshop: Graphic software.
- Application software may be classified into:
  - Desktop Application
  - Web Application
  - Mobile Application

### Activity:

List a name of a program for each category of the above application software.

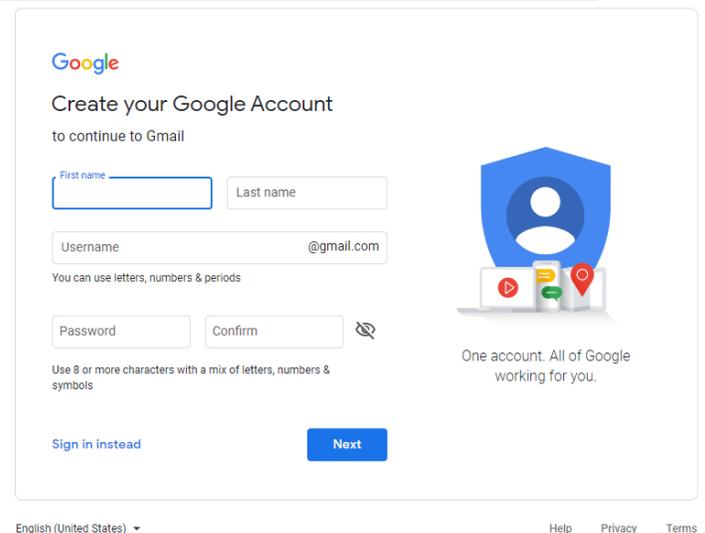
### - Desktop Application:

- Runs as a stand-alone program on a PC or laptop.
- It may require an installation process.
- Examples:
  - o Calculator, Photoshop, MS office, ....



### - Web Application (or web app):

- Runs inside a web browser.
- Examples:
  - o Facebook, web-email, Google Classroom, ....



### - Mobile Application (or app):

- Runs in a mobile device like smartphone or tablet.
- Examples:
  - o Instagram, Google Weather, Telegram, WhatsApp, Google Maps, ...



## System Software:

- System software are programs that manage and control the operations of computer hardware.
- These programs enable the computer to boot, launch application programs, configure your computer to work with the hardware connected to it, connect your computer to a network, manage files on hard drive, and protect your computer from unauthorized use.
- Examples of system software:
  - o Operating Systems
  - o Device Drivers
  - o Utility programs such as disk defragmentation, back-up, etc..

## - Operating System:

- An Operating System (OS) is a system software that installed to coordinate and manage all the operations and activities running on a computer.
- OS also provides an interface between application software and computer hardware.

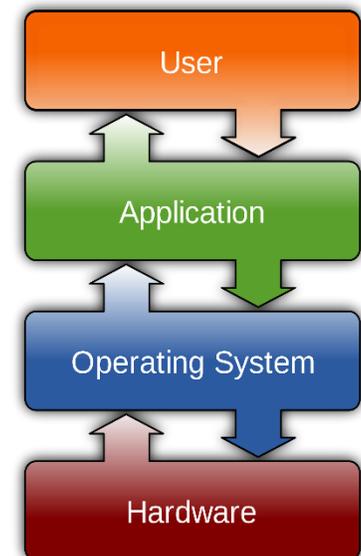
## - Examples of Desktop OS:

- o Windows
- o Linux
- o Unix
- o Mac OS



## - Examples of Mobile OS:

- o Android
- o iOS
- o Windows Phone



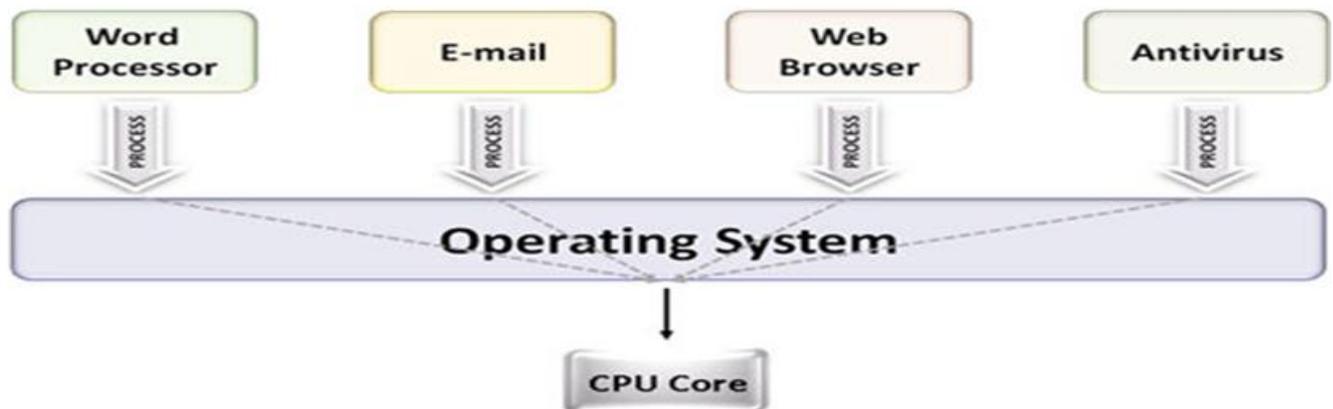
## Main functions of an Operating System:

### - **Booting the computer**

- The OS is the first program that is loaded to run when the computer is turned on.

### - **Process Management:**

- The OS responsible for running computer programs.
- It also coordinates the execution of multiple programs simultaneously (*Multitasking*).



### - **Memory Management:**

- OS loads program into memory for execution in efficient way.
- The memory is a shared resource, so the OS optimizes the RAM to speed up the processing of programs.

### - **Administering Security:**

- OS uses passwords and biometric characteristics and other security procedures to limit access to the computer and other system resources to only authorized users.
- OS also manages the privileges and access permissions of multi-user computer systems.
- Additionally, OS protects the computers from attackers and unauthorized access.

## - User Interface:

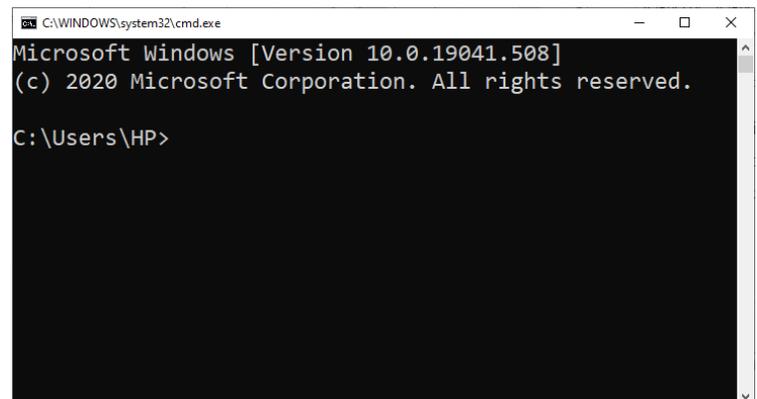
- OS provides the view at which the user interacts with applications. The interface provides means of inputting data and producing information.

- User Interface may be:

- **Graphical User Interface (GUI):** the user interacts with visual images by touching, pointing, tapping, or clicking buttons, menus, icons and other objects to issue commands.



- **Command Line Interface (CLI):** the user writes commands by typing text to enter data and instructions.



## - Configuring Devices:

- The OS configures all devices connected to a computer.
- Small programs called *device drivers* (or drivers) are used to communicate with peripheral devices, such as monitors, printers, scanners ....

- Nearly, all the operations and services running on a computer is controlled and managed by the OS. For example, the OS is also responsible for File and disk Management, Performance Monitoring, Network and Internet connections, ...

### Activity:

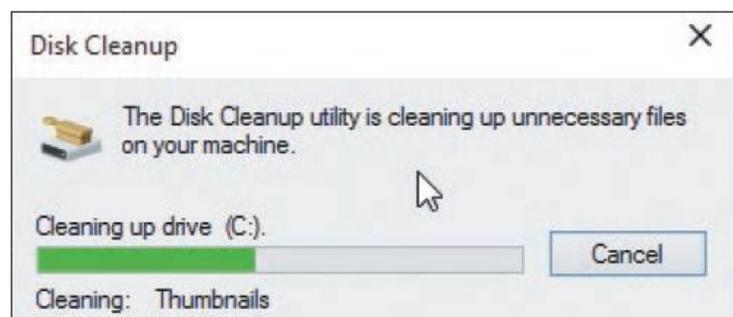
A single physical computer can support multiple operating systems that operate independently. Search for the term describing this feature.

### - Utility Program:

- A utility program is a software usually related to managing or maintaining a computer system. It optimizes the performance of a computer.

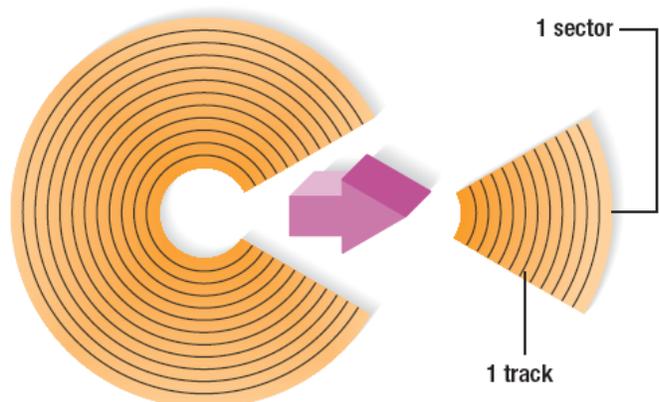
- Examples of Utility programs:

- o Programs for finding files
- o Cleaning up a hard drive
- o Backing up software
- o File Compression
- o Disk defragmentation
- o Antivirus Programs



### Disk Defragmentation:

- system maintenance tool
- Used to rearrange data fragments on hard disk
- Increases data access efficiency



### Back-up Tools:

- Create identical copy of the data (replica)
- Original data can be restored from the back-up
- Normally, a back-up copy is stored off-site



### Discussion:

- Which desktop OS is most popular today?
- Which Mobile OS is most popular today?
- How does disk defragmentation decrease the time needed to read/write data on disk?

## CHAPTER QUESTIONS:

Q1) State whether each of the following statements is **TRUE** or **FALSE**.

	<b>Statement</b>	<b>TRUE / FALSE</b>
[1]	A computer needs an operating system to work.	
[2]	Command-line interfaces often are difficult to use because they require exact spelling, grammar, and punctuation.	
[3]	Disk defragmentation increases data access efficiency (speed).	
[4]	Smart devices usually have a special operating system.	
[5]	Microsoft Office Word is an example of utility software.	
[6]	A web browser (like Google Chrome) is an example of system software.	
[7]	A device driver is a system software that enables the computer to identify some hardware.	

Q2) Choose the best answer:

<b>1</b>	If a new device is attached to a computer, such as a printer or scanner, its _____ must be installed before the device can be used.	<b>A.</b> Buffer <b>B.</b> Pager <b>C.</b> Driver <b>D.</b> Server <b>E.</b> None of the choices
<b>2</b>	A(n) _____ shrinks the size of a file.	<b>A.</b> Disk defragmenter <b>B.</b> File compression utility <b>C.</b> Screen saver <b>D.</b> Uninstaller <b>E.</b> None of the choices
<b>3</b>	A _____ is a utility that reorganizes the files and unused space on a computer's hard disk so the operating system can access data more quickly and programs can run faster.	<b>A.</b> Disk scanner <b>B.</b> Disk defragmenter <b>C.</b> File viewer <b>D.</b> File compression utility <b>E.</b> None of the choices