



جامعة بوليتكنك فلسطين



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CHAPTER ONE

INTRODUCTION TO COMPUTERS

PREFACE:

This chapter sheds some lights on the main concepts and terminologies related to computing and information technology. It addresses the basic functions of the computer systems, and how much important the computer can support and affect our life. In addition, we'll cover the main types the computing machines are existing around the world, while differentiating among these types based on miscellaneous criteria.

INTENDED LEARNING OUTCOMES:

- 1) Teach the fundamentals of computers and computer terminologies, particularly with respect to personal computer hardware and software.
- 2) Give students an in-depth understanding of how computers are essential in our daily practices.
- 3) Recognize the main functions of computing, and gain the awareness of trendy computing sciences.
- 4) Present the foremost types of computer machines, and give students enough knowledge about the traits of each one.

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 .

WHAT IS A COMPUTER?

- A Computer is a digital machine that operates under a set of instructions and rules, so that it will be capable of inputting data, performing processing, producing results, and probably storing results for future use.

- The computer can be viewed from two perspectives:
 - Hardware: the physical parts of the computer, which consist of electrical, electronic and mechanical parts that compose the computer machine.

 - Software: data and instructions at which when executed will operate and manage the computer hardware.

ROLE OF COMPUTERS IN OUR LIFE:

Computers are nowadays playing a vital role in every activity in our life. For instance, you may use computers and their applications in:

- 1) Education and Scientific Research
- 2) Business, Shopping and Marketing Fields
- 3) Healthcare sector
- 4) Banking and Financial contracts
- 5) Industries
- 6) Government offices
- 7) Entertainment
- 8) Home and Building Management Systems
- 9) Weather Forecasting
- 10) Social Communication

Activity:

Have you ever created a professional profile on LinkedIn Network!

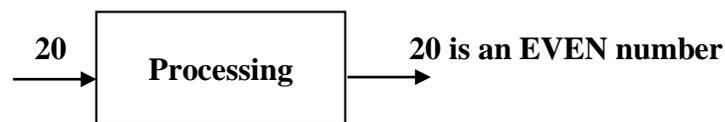
It is the time now to do so and to expose yourself to the world of professional networking on the Internet. Visit: <https://www.linkedin.com> and start creating your existence there.

DATA, INFORMATION, AND KNOWLEDGE:

- **A computer processes data to produce information:**



- Data are raw facts and items that don't convey any meaning.
 - Data may be: numbers, characters, symbols, texts, sounds, images,....
 - Examples: 20, "Ahmad", 'A', 986.35
- Information: processed data that arranged in a way that looks useful and conveys meaning in an understandable way.



- A level that comes after information called "Knowledge". Knowledge is the understanding of information about a subject that you get by experience, study, perceiving, discovering, or learning.
 - *It is gathered from learning and education (information in practice).*
 - *It is merely having clarity of facts and truths.*

- Nowadays, computers make many decisions without human intervention. That is, they receive data as input and they process it in a manner that produces decisions and actions as output. This leads to the foremost field in computing which is called “Artificial Intelligence”.
- Artificial Intelligence (AI) is to have intelligent machines that mimic humans minds, based on the perception of its environment, and based on a set of rules that enable the machine to take decision properly, while it learns by experience.

BASIC COMPUTING TERMINOLOGIES

- Computer Science (CS):
CS encompasses the study of computers, how they work, and how to make use of them. Computer scientists deal mostly with software and software systems; this includes their theory, design, development, and application.
- Information Technology (IT):
IT is the use of computers to store, retrieve, transmit, and manipulate data, or information, often in the context of a business or other enterprise.
- ICT is an acronym for “Information and Communication Technology” which revolves around the integration of telecommunications (telephone lines and wireless signals) and computers, as well as necessary enterprise software, storage, and audiovisual systems, that enable users to access, store, transmit, and manipulate information.

Activity:

Visit: <https://www.wikipedia.org> and start searching for more details of the aforementioned definitions.

COMPUTER TYPES:

Computers may be classified into:

- Personal Computers (PC)
 - Smart Devices (Mobile Devices)
 - Servers
 - Mainframes
 - Supercomputers
 - Embedded Computers
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- Before delving into the details of each type, we ought to ensure that any system capable of inputting data, processing or manipulating it, generates results, and storing these results is a *Computing Machine*.
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- We'll classify computers based on different factors like:
 - Uses of the computer
 - Size
 - Number of users at the same time
 - Operating System (OS): The software responsible for the operation and management of the computer.
 - Price
 - Performance

1 Personal Computers (PC)



- Small in size, fits in your desktop or your lap
- Suitable for every day computing, browsing the Internet, playing games, sending emails
- Cheap price and suitable performance

2 Smart Devices, Mobiles and Tablets

- Very small size, usually handheld
- Prices range from very cheap to expensive, depending on model
- Have special Operating Systems
- The Number of Smart Devices today is growing rapidly
- Today, Smart Devices are sold more than all Total PCs



3 Servers

- The purpose of these Computers is to serve
- Usually have more processing power than Personal Computers
- These computers run 24/7
- Examples: Email Servers, Web Servers



4 Mainframes

- Very fast and powerful Computers
- Big Size, the size of closet
- Expensive (\$50,000 – \$200,000)
- Used by Banks, Universities, research centers
- Can handle 100s of users at the same time

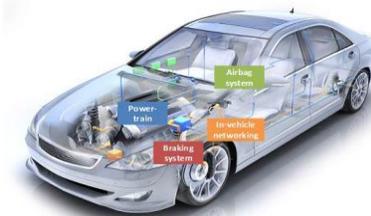


5 Supercomputers

- Very fast and Powerful
- Faster than Mainframes
- Very expensive (million dollars at least)
- Very big size (size of a room)
- Used by governments (Intelligence Agencies), Space research (NASA), Weather Forecasting
- As a comparison, for example an operation on a PC that takes 30 days can be done on a Supercomputer in few minutes



6 Embedded Computers



- Found today in most electronic devices, Cars, air planes, Game Consoles (Wii, PlayStation), Printers, Cameras, ADSL Routers, etc..
- Are special purpose computers
- Designed and programmed to do specific tasks in real time

Activity:

In one sheet, based on what discussed in the class, differentiate between the 6 general types of computers.

CHAPTER QUESTIONS:

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

	Statement	TRUE / FALSE
[1]	Computers process information to create data.	
[2]	Hardware consists of a series of instructions that tells the computer what actions to perform and how to perform them.	
[3]	Because embedded computers are components in larger products, they usually are small and have limited hardware.	
[4]	Data conveys meaning to users, and information is a collection of unprocessed items, which can include text, numbers, images, audio, and video.	
[5]	Wisdom is the ability to use your knowledge and experience to make good decisions and judgments.	

Q2) Choose the best answer:

1	LinkedIn is a:	<ul style="list-style-type: none"> a. Type of Computer b. A Software c. A Server d. Professional Network
2	_____ is/are the steps that tell the computer how to perform a particular task.	<ul style="list-style-type: none"> a. Data b. Information c. Instructions d. Documentation

3	Although not as powerful as a supercomputer, this type of computer is capable of great processing speeds and data storage.	a. Laptop b. Mainframe c. Supercomputer d. Desktop Computer
4	The circuitry of the computer is part of:	a. Software b. Hardware c. Data d. Firmware
5	A game console is a type of:	a. Embedded Computer b. Server c. Mobile Device d. Mainframe