

Abdelhafid Boussouf University Center - Mila

Institute of Science and Technology

Department of Process Engineering

Practical Work 01

Module: Structure of Computers and Applications

Level: 1st year ST - ENG & LMD

By:

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Academic Year: 2025/2026

Introduction

This practical work aims to bridge the theoretical concepts of computer science with hands-on exploration of your own computer system. Through these exercises, you will:

- Identify your computer's hardware specifications and relate them to historical generations of computers
- Understand the difference between 32-bit and 64-bit architectures
- Practice data storage capacity calculations and conversions
- Analyze character encoding systems and their practical applications
- Explore the software installation process and system interactions
- Observe process management through system monitoring tools
- Practice binary number system conversions

These exercises will help you develop a deeper understanding of how computer systems work at both hardware and software levels, while reinforcing the fundamental concepts discussed in the theoretical lectures.

Instructions:

1. Complete all exercises individually or in groups as instructed
2. Show all calculations where required
3. Use your computer's built-in tools and online research to find answers

Exercise 1: Identify Your Computer's Generation

Objective: Link your computer's hardware to the historical generations of computers.

Instructions: Find your computer's processor (CPU) model and its approximate release year.

You can find this in: **Windows:** Settings → System → About **Mac:** Apple menu → About This Mac

Your Findings:

- CPU Model: _____
- Release Year: _____

Questions:

1. Based on the lecture's "Generations of Computers" table, which generation does your CPU belong to?

First Generation (1940-1956)

Second Generation (1956-1963)

Third Generation (1964-1971)

Fourth Generation (1971-Present)

Fifth Generation (Present and Beyond)

2. List two characteristics from the lecture that confirm this classification:

- Characteristic 1: _____
- Characteristic 2: _____

Exercise 2: Explore System Architecture

Objective: Understand the difference between 32-bit and 64-bit systems.

Instructions: Find your system type in: **Windows:** Settings → System → About → System type

Mac: Apple menu → About This Mac → Chip

Your Findings:

- System Type: _____ (64-bit/32-bit)
- Processor: _____

Question:

What is the main advantage of a 64-bit system over a 32-bit system in terms of binary number processing?

Can process longer binary numbers

Uses less electricity

Makes the computer quieter

Needs more cooling

Exercise 3: Software Installation Analysis

Objective: Understand what happens during software installation.

Instructions: Install a free program like VLC Media Player or 7-Zip.

Your Findings:

1. Installation source (where you downloaded it from):

Official website

App Store/Microsoft Store

Other: _____

2. Installation directory (where it was installed):

3. List three file types you found in the installation directory:

- File type 1: _____ (e.g., .exe)
- File type 2: _____ (e.g., .dll)
- File type 3: _____ (e.g., .txt)

Questions:

1. What is the main purpose of a .exe file?

Store user settings

Contain executable program code

Hold graphic images

Backup data

2. How does this installation process demonstrate the computer's task of "Data Storage" from the lecture?

Exercise 4: Process Management

Objective: Observe how the operating system manages running programs.

Instructions:

1. Run the program you installed in Exercise 5
2. Open Task Manager (Ctrl+Shift+Esc) or Activity Monitor
3. Find the program's process

Your Findings:

- Process Name: _____
- CPU Usage: _____
- Memory Usage: _____

Question:

How does the Task Manager display relate to the computer's task of "Control" from the lecture?

It shows how the computer controls user input

It shows how the operating system manages and controls running programs

It shows how to control computer hardware

It shows how to control internet speed

Exercise 5: Binary Conversion Practice

Objective: Practice converting between decimal and binary systems.

Instructions: Convert these decimal numbers to binary:

1. Decimal: 10
Binary: _____
2. Decimal: 25
Binary: _____
3. Decimal: 37
Binary: _____