Abdelhafid Boussouf University Center - Mila

Institute of Science and Technology

Department of Process Engineering

Practical Work 02

Module: Structure of Computers and Applications

Level: 1st year ST _ ENG & LMD

By:

Dr. KECITA Farouk

Academic Year: 2025/2026

Exercise 1: Binary to Decimal Conversion
Convert the following binary numbers to decimal numbers: 110, 1100, 100101110.

Exercise 2: Decimal to Binary Conversion
Convert the following decimal numbers to binary numbers: 43, 51, 128, 131, 202.

Exercise 3: Hexadecimal Conversion
Convert the following hexadecimal numbers to binary and then to decimal numbers: 12, DADA, and 5F3.

Exercise 4: Mixed Base Conversions
Perform the following conversions:

Base X to base 10:

1. $(1523)_8 = (\ldots\ldots\ldots\ldots)_{10}$
2. $(BAFF)_{16} = (\ldots\ldots\ldots\ldots)_{10}$
3. $(152.44)_8 = (\ldots\ldots\ldots\ldots)_{10}$
4. $(10B.7)_{16} = (\ldots\ldots\ldots\ldots)_{10}$

Base 10 to base X:

1. $(142)_{10} = (\ldots\ldots\ldots\ldots)_2$
2. $(253)_{10} = (\ldots\ldots\ldots\ldots)_{16}$
3. $(7.875)_{10} = (\ldots\ldots\ldots)_8$

Exercise 5: Conversions Using Base 2 as Intermediate Base
Perform the following conversions using base 2 as an intermediate base:

a. $(673)_8$ to hexadecimal. $(673)_8 = (\ldots\ldots\ldots\ldots\ldots\ldots)_2 = (\ldots\ldots\ldots\ldots\ldots\ldots)_{16}$

b. $(E7C)_{16}$ to octal. $(E7C)_{16} = (\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots)_2 = (\ldots\ldots\ldots\ldots\ldots\ldots\ldots)_8$

c. Write the following numbers in base 8, and base 16:

   1. 1110101000011100101.101
   2. 11001010110001101.0001
   3. 111010011011.00111

Exercise 6: Homework

1. Convert $(1011.101)_2$ to decimal.
2. Convert $(29.375)_{10}$ to binary.
3. Perform binary addition: $(11011)_2 + (10101)_2$
4. Perform binary subtraction: $(11000)_2 - (1011)_2$
5. Convert $(3A.2B)_{16}$ to binary and decimal.