



Introduction to Computing (CS101)

Assignment # 01

Fall 2021

Total marks = 20

Due Date:
December 14, 2021

Please carefully read the following instructions before attempting assignment.

RULES FOR MARKING

It should be clear that your assignment would not get any credit if:

- The assignment is submitted after the due date.
- The submitted assignment does not open or file is corrupt.
- Strict action will be taken if submitted solution is copied from any other student or from the internet.

You should consult the recommended books to clarify your concepts as handouts are not sufficient.

You are supposed to submit your assignment in **.doc or docx** format.

Any other formats like scan images, PDF, zip, rar, ppt and bmp etc will not be accepted.

Objectives:

- **To understand the practical implementation of Number System and learn how to convert numbers from decimal to binary or binary to decimal.**
- **To understand the concept of Addition in binary Boolean Logical Operations.**
- **To understand the basic concept of Boolean Logical Operations.**

NOTE

No assignment will be accepted **after the due date via email in any case** (whether it is the case of load shedding or internet malfunctioning etc.). Hence refrain from uploading assignment in the last hour of deadline. It is recommended to upload solution file at least two days before its closing date.

If you find any mistake or confusion in assignment (Question statement), please consult with your instructor before the deadline. After the deadline no queries will be entertained in this regard.

For any query, feel free to email at:
cs101@vu.edu.pk

Questions No 01 Marks (12)

A. Encode the following decimal fractional value to binary floating point notation using the 8-bit floating-point format.

- -3.5

Answer;

As number is negative so sign bit notation is 1.

- First convert 3.5 into binary

Binary of 3.5 is 011.1

Mantissa field:

0111

radix in .0111 must be moved 3 bit to the right to obtain

011.1

So exponent is positive 3...

Final 8 bit floating point notation is

1	1	1	1	0	1	1	1
---	---	---	---	---	---	---	---

B. Decode the following 8-bit floating point binary value to decimal fractional value.

- 00101100

Answer:

0	0	1	0	1	1	0	0
---	---	---	---	---	---	---	---

Mantissa is:

.1100

Exponent:

010

It is in 3-bit excess notation-4:

-2

Exponent is negative so shift radix (.1100) left

.001100

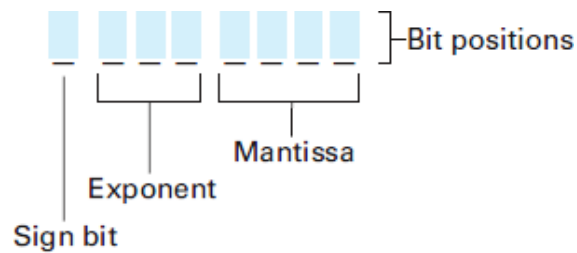
Convert it into decimal fractional value

.001100 is equal to .0011

.	2^{-1}	2^{-2}	2^{-3}	2^{-4}
.	1/2	1/4	1/8	1/16
.	0	0	1	1

$$0+0+1/8+1/16=0.1875$$

Hint: Use the following 8-bit floating-point notation to convert these values.



Questions No 02 Marks (04)

Perform the binary addition on the following decimal numbers:

$$\bullet \quad 46_8^3 \quad \text{and} \quad 92_8^7 \quad -$$

Answer:

Convert into binary

$$46(3/8)=101110.0110$$

$$92(7/8)=1011100.1110$$

Now,
Addition

$$1+0=1$$

$$1+1=0 \text{ (1 carry)}$$

$$1+1+1=1 \text{ (1 carry)}$$

$$0+1=1$$

	1	0	1	1	1	0	0	.	1	1	1
	0	1	0	1	1	1	0	.	0	1	1

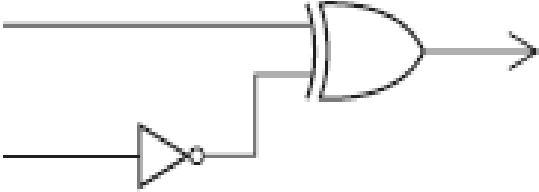
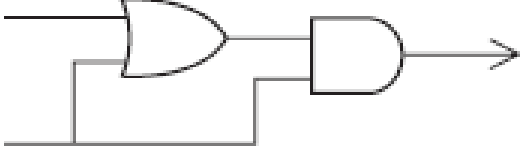
											+
1	0	0	0	1	0	1	1	.	0	1	0

So,
10001011.010

Questions No. 03 Marks (04)

The logical operations (AND, OR, NOT, and XOR etc.) discussed in the video lessons can be combined to perform some specific operations. Two such operations (circuits) are depicted in the first column “Circuits” of the following table. You are required to determine the output of each of the following circuits for the input values given in column 2 and column 3.

Answer:

Circuits	What would be the output when the upper input is 1 and the lower input is 0?	What would be the output when upper input is 0 and the lower input is 1?
 INPUTS OUTPUT	0	0
 INPUTS OUTPUT	0	1

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