NSSA-102 Computer System Concepts Fall 2023/2024

Instructor: Qusai Hasan

Lab 2: Logic Circuit Simulation

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Part 1: Boolean Function simulation

1. Complete the truth table for the above functions by hand.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A | B | C | F1 | F2 |
| 0 | 0 | 0 | 1 | 1 |
| 0 | 0 | 1 | 1 | 1 |
| 0 | 1 | 0 | 1 | 0 |
| 0 | 1 | 1 | 0 | 1 |
| 1 | 0 | 0 | 1 | 1 |
| 1 | 0 | 1 | 1 | 1 |
| 1 | 1 | 0 | 1 | 1 |
| 1 | 1 | 1 | 1 | 0 |

1. A computer screen shot of a computer

   Description automatically generatedDraw the circuit of the above functions using CircuitVerse. You may use NOT, AND, OR, NAND, and XOR gates only.
2. Simulate the circuit using the combination A=0, B=0 and C=0, and verify that the output is equal to the value shown in your truth table

Paste a snap-shot of your simulation here:

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1. Simulate the circuit using the combination A=0, B=1 and C=1, and verify that the output is equal to the value shown in your truth table

Paste a snap-shot of your simulation here:

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1. Simulate the circuit using the combination A=1, B=0 and C=0, and verify that the output is equal to the value shown in your truth table

Paste a snap-shot of your simulation here:

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1. Simulate the circuit using the combination A=1, B=1 and C=1, and verify that the output is equal to the value shown in your truth table

Paste a snap-shot of your simulation here:

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Part 2: 3-to-8 Decoder simulation

Use circuitverse to draw the below 3-to-8 decoder. Note that you can find a decoder inside “Decoder & Plexers” in the circuit elements toolbox.



1. Simulate the circuit using the combination IN = 010, and verify that the output is correct.

Paste a snap-shot of your simulation here:

A computer screen shot of a diagram

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1. Simulate the circuit using the combination IN = 101, and verify that the output is correct.

Paste a snap-shot of your simulation here:

A screenshot of a computer

Description automatically generated

1. Simulate the circuit using the combination IN = 110, and verify that the output is correct.

Paste a snap-shot of your simulation here:

A computer screen shot of a diagram

Description automatically generated

1. Simulate the circuit using the combination IN = 111, and verify that the output is correct.

Paste a snap-shot of your simulation here:

A screenshot of a computer

Description automatically generated