EEE 120

Lab 1 Answer Sheet (Online Class)

Half Adder, Full Adder, 4-bit Incrementer and Adder

Name: Yengkong Sayaaovong

Semester/Year/Session (A/B): 2022 Spring A Date:1/23/2022

**Task 1-1: Build and Test the 1-Bit Half-Adder**

Include a picture of your circuit in Digital here:![Diagram, schematic

Description automatically generated]()

Please comment on the single biggest issue you were facing when designing the circuit.

**There was no issues with this lab.**

Include a picture of your waveform (timing diagram) here:![Graphical user interface

Description automatically generated]()

Did the circuit behave as expected? If no, what was wrong?

**Yes it did behave as expected**

Please comment on the single biggest issue you were facing when simulating the circuit.

**Remembering the commands to get into the GTKWave.**

**Task 1-2: Build and Test a 4-Bit Increment Circuit**

Include a picture of your circuit in Digital here:![Diagram, schematic

Description automatically generated]()

Please comment on the single biggest issue you were facing when designing the circuit.

**The “a” input was originally red so I had to relook at it to see why and where it failed.**

Include a picture of your waveform (timing diagram) here:

![Graphical user interface

Description automatically generated]()

Did the circuit behave as expected? If no, what was wrong?

**Yes, it performed as expected.**

Please comment on the single biggest issue you were facing when simulating the circuit.

**Remembering the commands to get into the GTKWave.**

**Task 1-3: Build and Test a 1-bit Full Adder**

Include a picture of your circuit in Digital here: ![Diagram, schematic

Description automatically generated]()

Please comment on the single biggest issue you were facing when designing the circuit.

**I had the wrong connection at first so the circuit did not work.**

Include a picture of your waveform (timing diagram) here:![Diagram

Description automatically generated with medium confidence]()

Did the circuit behave as expected? If no, what was wrong?

**Yes, it behaved as I expected.**

Please comment on the single biggest issue you were facing when simulating the circuit.

**Remembering the commands to get into the GTKWave.**

**Task 1-4: Build and Test a 4-Bit Full Adder**

Include a picture of your circuit in Digital here:![Diagram, schematic

Description automatically generated]()

Please comment on the single biggest issue you were facing when designing the circuit.

**I had to respell “overfl” so I can do the wire test because I originally spelled it “overflow.” I also forgot to change “b” input to “4”.**

Include a picture of your waveform (timing diagram) here:![Graphical user interface, diagram

Description automatically generated]()

Which tests did you perform and why? The following table is an example of how to describe your test sequence. You need to make sure to perform a sufficient number of tests to check the circuit for eventual faults.

| **Test stimulus** | **Test motivation** | **Pass/Fail** |
| --- | --- | --- |
| 0\_0\_0\_0\_0 | Check for stuck-at-1 faults | Pass |
| All inputs 1 | To see if there is overflow | Pass |
| The input A is all 1  The input B is all 0  Carry in 1 | To see if there is a 1 carried out. | Pass |
| The input A is all 1  The input B is all 0  Carry in 1 | Make show there is no overflow | Pass |
|  |  |  |
|  |  |  |

Please comment on the single biggest issue you were facing when simulating the circuit.

**Remembering the commands to get into the GTKWave.**

**Task 1-5: Create a video and submit your report (Optional).**

[This task is useful to get partial credit if your schematic is not working. Take advantage of it to explain to the grader your understanding of the circuit. More importantly, explain where you think the mistake is in and what you would do if you were given more time to fix it.]

Record a short video showing your schematic in Digital and your waveforms in GTKWave. Be sure to show yourself in the video and show your screen. **Upload the video to your Google Drive (personal one or ASU one). Copy and paste the sharing link to that video here. Make sure the link is working and pointing to the correct video. Do NOT upload your video to YouTube.** If your circuit is not working as expected, explain in the video how it is not working and where you expect the mistake to be from.

**Video Link:** <https://drive.google.com/file/d/1Ahfm_aHqQTopJl_oXaYoLW7KKW9xUsK2/view?usp=sharing>

<https://drive.google.com/file/d/1tFEVlSCU1TgeDBp8mz1Hn-FLk4Ryssfs/view?usp=sharing>

<https://drive.google.com/file/d/13RwaBG5S8uGmK4LpRj1k1wH1QlDWatJh/view?usp=sharing>

<https://drive.google.com/file/d/1CiDn4qjWUgeC7x7sYu0WYoEWo-8LJid7/view?usp=sharing>

**At the beginning of your recording, say your name, the task number and circuit name. Be brief in your recording. Submit the completed template to Canvas.**

**Make sure all your files are in the Lab0 directory. Create a zip file of the Lab0 directory. Remember to turn in the zip file and your completed template on Canvas! Make sure you upload the template before the zip file.**

Lab 1: Lab Report Grade Sheet

|  |  |
| --- | --- |
| **Name:** |  |

## Instructor Assessment

| **Grading Criteria** | **Max Points** | **Points Lost** |
| --- | --- | --- |
| **Description of Assigned Tasks, Work Performed & Outcomes Met** |  |  |
| Task 1-1: Build and Test a 1-Bit Half-Adder | 15 |  |
| Task 1-2: Build and Test a 4-Bit Increment Circuit | 20 |  |
| Task 1-3: Build and Test a 1-Bit Full Adder | 15 |  |
| Task 1-4: Build and Test a 4-Bit Full Adder | 20 |  |
| Task 1-5: Create a video and submit your report (Optional) | - |  |
|  | **Points Lost** |  |
| Lab Score (70 points total) | **Late Lab** |  |
|  | **Lab Score** |  |