EEE 120

Honor Lab Answer Sheet

Microprocessor on the Board

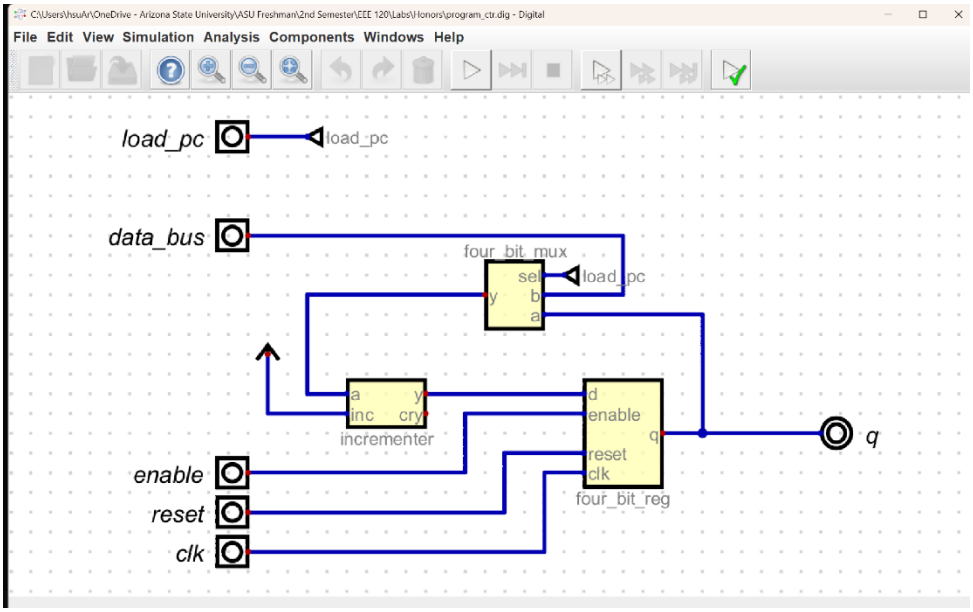
Name: Archer Hsu

Instructor/Time: Professor Steven Millman

Date: 2 May 2025

Task H-1: Add the JUMP Instruction

Include a picture of your Digital circuit here:



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

There weren't any issues with the design. It was a little weird designing the circuit from scratch.

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

The circuit behaved as expected.

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

No issues.

Paste the contents of your jump rom_vals here:

1205 # JUMP; Load IR 8

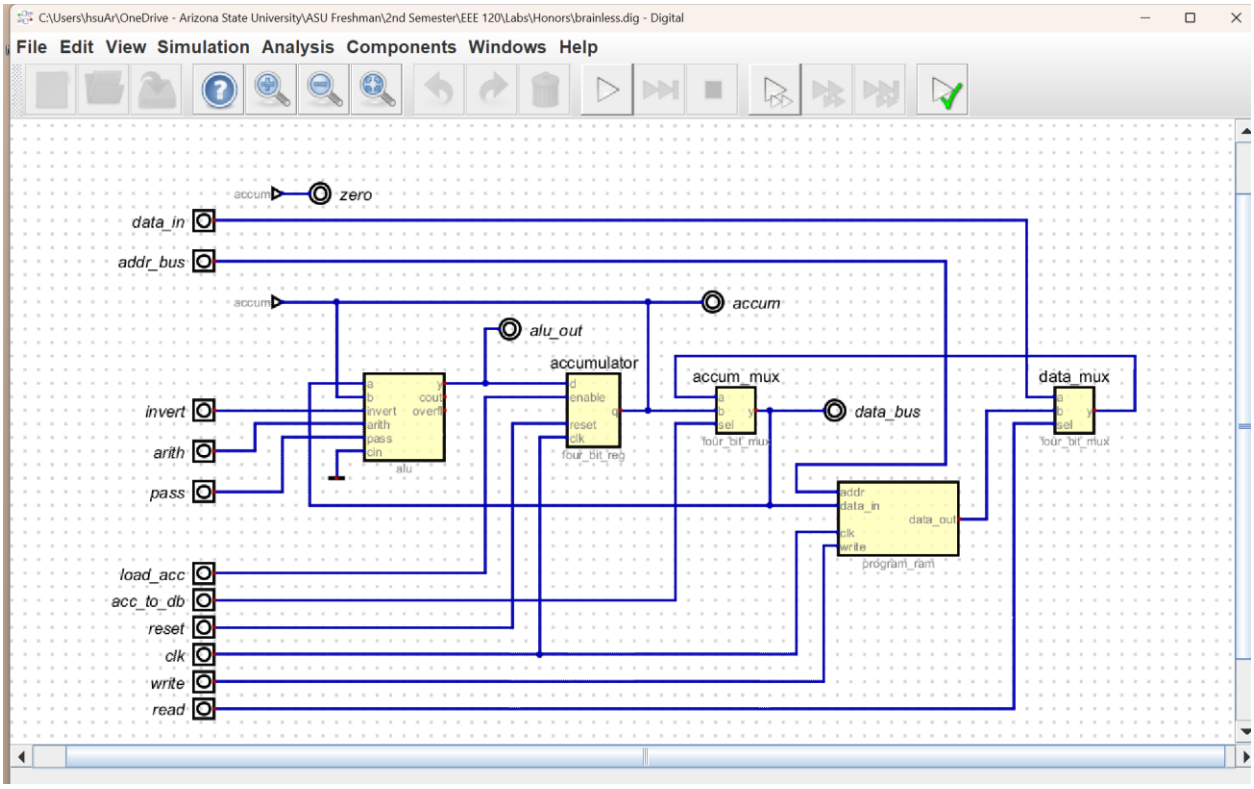
0604 # JUMP to DATA_IN+1

0000 #

0000 #

Task H-2: Add the BRANCH ON ZERO Instruction

Include a picture of your modified brainless circuit here:



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

None

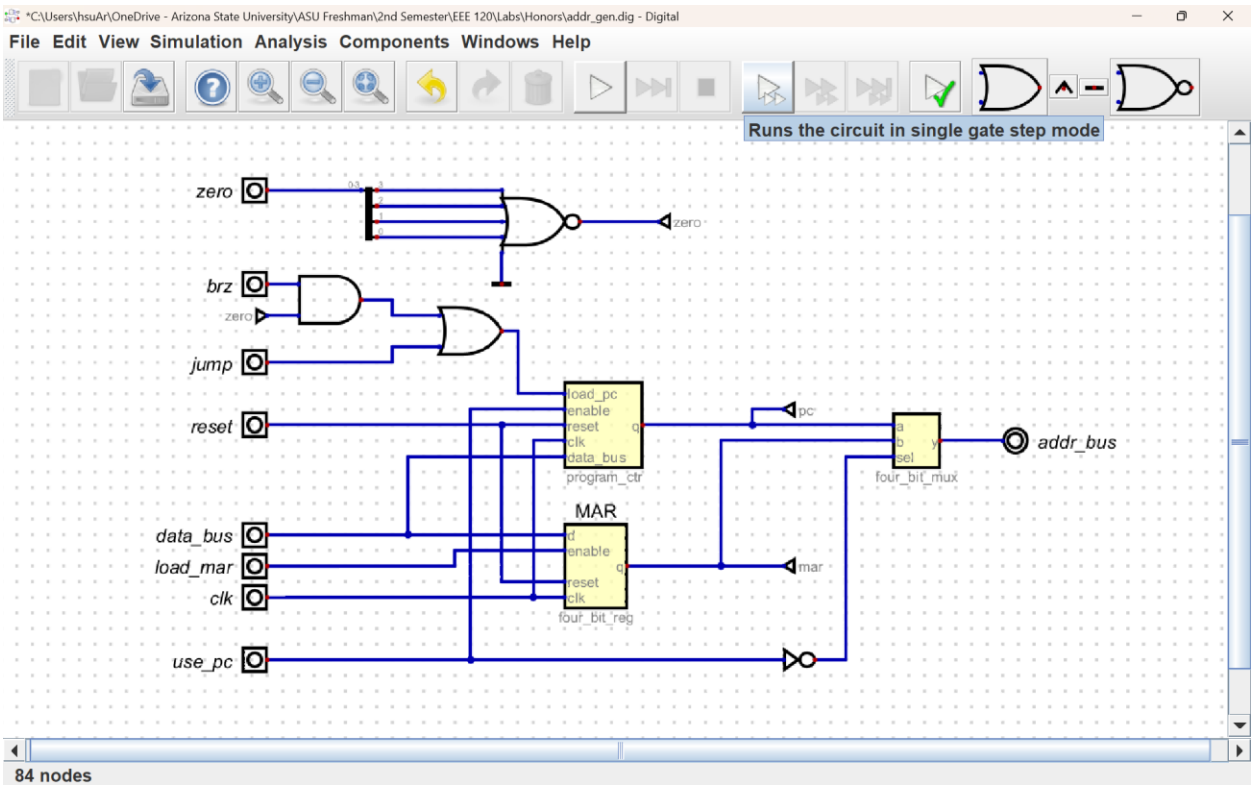
Did the circuit behave as expected? If no, what was wrong?

The circuit behaved as expected.

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

None

Include a picture of your modified adder_gen circuit here:



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

Figuring out how to design this circuit was difficult.

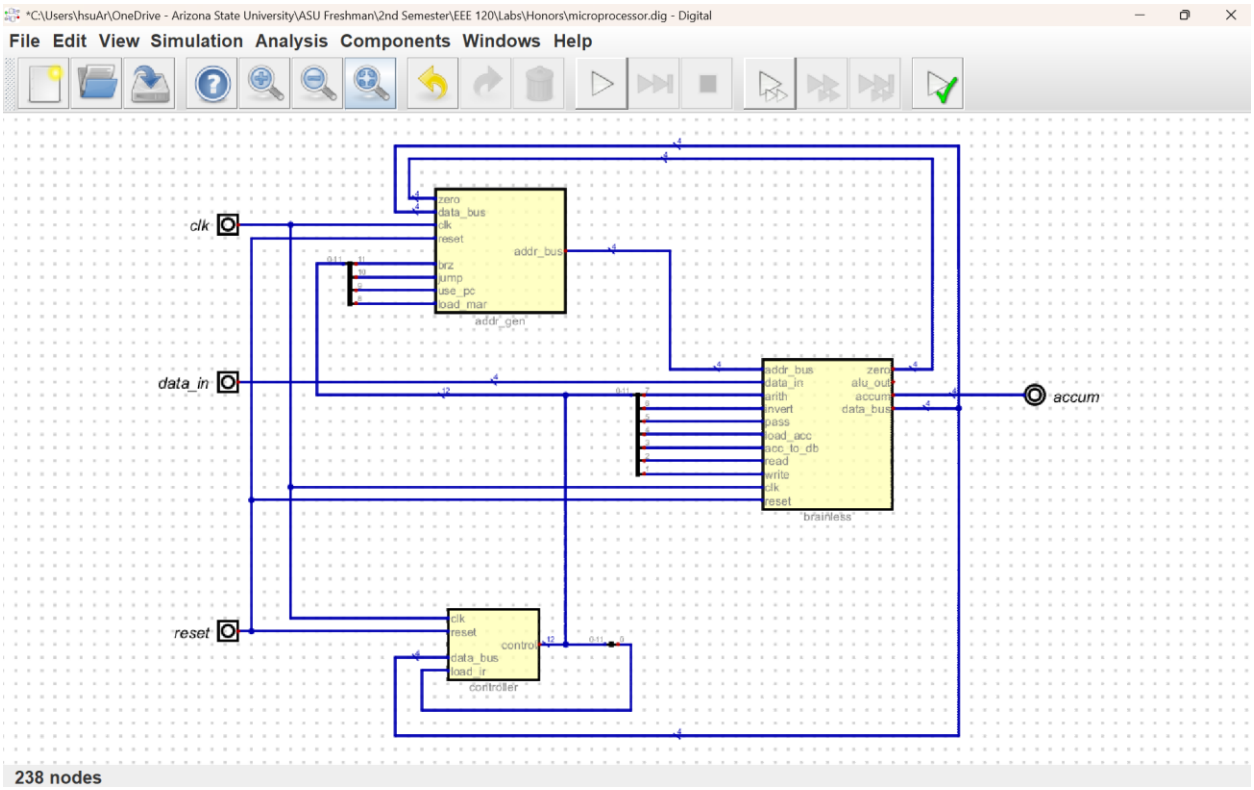
Did the circuit behave as expected? If no, what was wrong?

The circuit behaved as expected.

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

There wasn't a problem with simulating the circuit. The hardest part of this was designing the circuit.

Include a picture of your modified microprocessor here:



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

None.

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

The circuit behaved as expected

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

None.

Paste the contents of your BRZ rom_vals here:

1205 # BRZ; Load IR 9

0A04 # BRZ to DATA_IN+1 when ACC is 0

0000 #

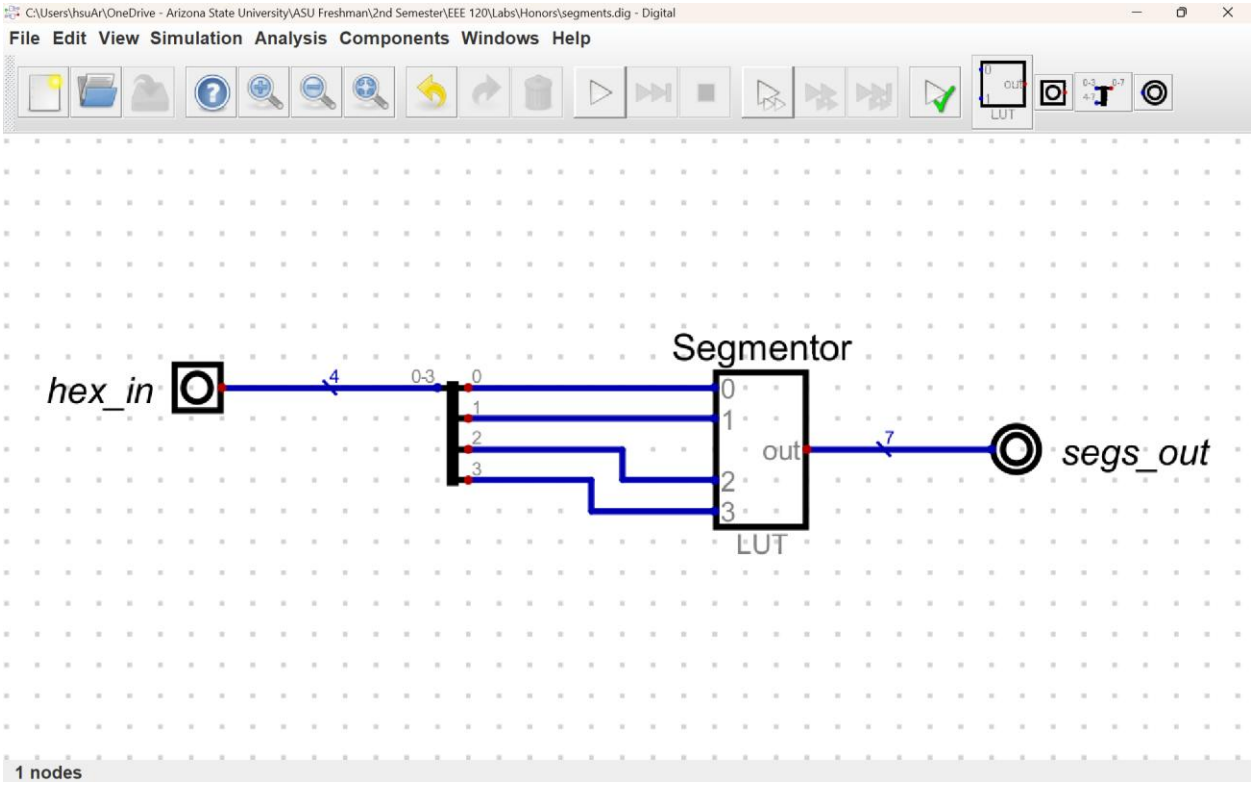
0000 #

Paste the contents of your created ram_vals here:

```
0   // Load ACC
5   //   value to load
5   // SUB ACC
1   //   value to sub
9   // BRZ
7   //
8   // JUMP
1   //
2   // STOP
```

Task H-3: Build the Seven-Segment Display Translator

Include a picture of your seven-segment display translator circuit here:



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

None

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

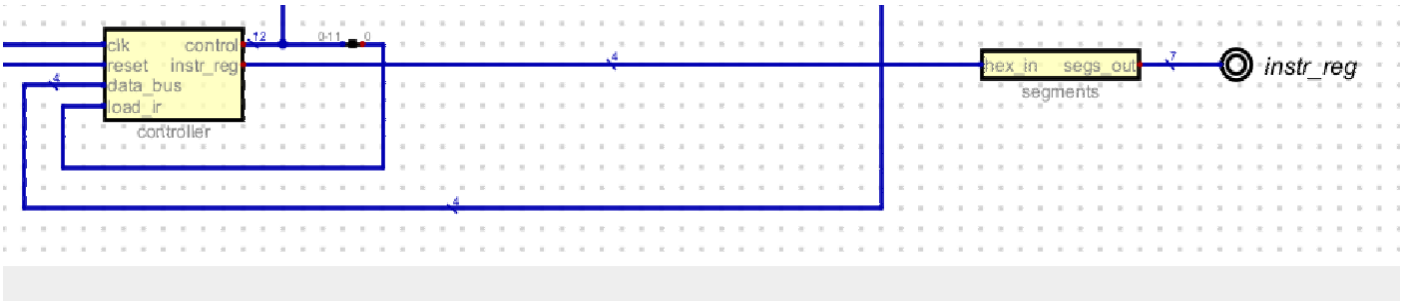
The circuit behaved as expected.

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

None

Task H-4: Bring the Instruction Register to the Top

Include a picture of your seven-segment display translator circuit here:



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

None

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

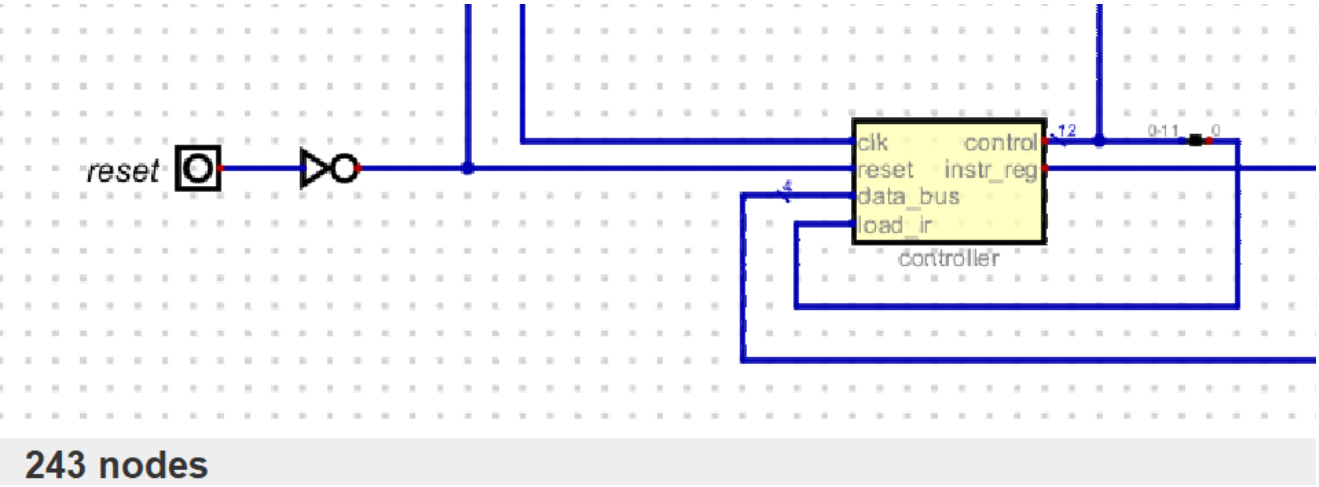
The circuit behaved as expected

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

None

Task H-5: Invert the Reset

Include a picture of your seven-segment display translator circuit here:



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

None. I just added the invert to the reset button

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

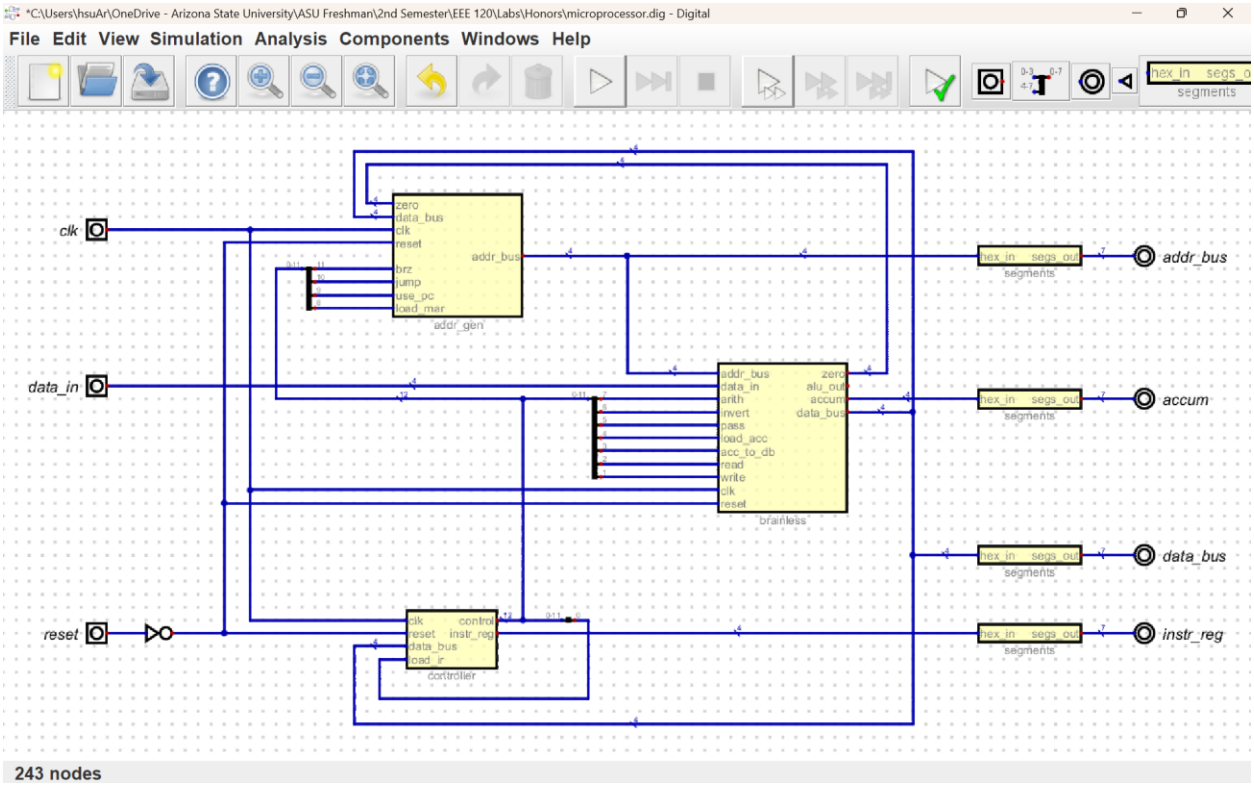
The circuit behaved as expected.

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

None.

Task H-6: Connect the Remaining Segments Instances and Assign Pins

Include a picture of your seven-segment display translator circuit here:



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

None

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

The circuit behaved as expected

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

None

Task H-7: Create a video and submit your report

Record a short video showing your schematics in Digital and your waveforms in GTKWave. Be sure to show yourself in the video and show your screen. Explain how your circuit works – you need to convince the grader you did the lab and understand it! **Copy and paste the link to your video below. Make sure the link is working and pointing to the correct video. Remember to include the password if required. Do NOT upload your video to Canvas. It is recommended that you use Zoom to record to the cloud, pasting the link and password below.** If your circuit is not working as expected, explain in the video how it is not working and why you think it is not working.

Video Link: https://asu.zoom.us/rec/share/4_S8Tv3RWu_fPtMlEo_GuzzouqXIKQVutHJzSOJE-PKW3TAdBykxPm4vxxUQissn.a8ybKprVIsSWekTr?startTime=1745377850000

Passcode: X1W0v*$Q

At the beginning of your recording, say your name and the lab name. Be brief in your recording. Submit the completed template to Canvas.

Make sure all your files are in the Lab2 directory. Create a zip file of the Lab2 directory. Remember to turn in the zip file and your completed template on Canvas!

Do not include the video in the zip file! This makes the file very large and you run the risk of the zip file not uploading or taking so long to upload that your submission will be late. Remember that the submission is dated at the time the upload completes, not when it starts!

LAB 4: LAB REPORT GRADE SHEET

Name: _____

NOTE: You submit the zip file in order to show your work.
If the zip file is not submitted you will receive a 0 for this lab!

Instructor Assessment

Grading Criteria	Max Points	Points Lost
Description of Assigned Tasks, Work Performed & Outcomes Met		
Task 4-1: Build and Test the Memory-Address-Generation Circuit	10	
Task 4-2: Build and Test the Controller Circuit	10	
Task 4-3: Build the Complete Microprocessor Circuit	10	
Task 4-4: Write and Execute a Simple Program for Your Microprocessor in Simulation	10	
Task 4-5: Add the 'AND', 'Zero', 'Subtract', and 'Store ACC' Instructions	30	
Task 4-6: Invent Your Own Instruction (Extra Credit)	10	
Task 4-7: Record your video	10	
Lab Score (80 points total)	**Points Lost**	
	Late Lab	
	Lab Score	