CSE 141L Milestone 2 Add-on Template

# Instructions

We are providing you with the template that should be copied and pasted into your Milestone 1 Report. The updated report, alongside your Verilog code, will be your submission for Milestone 2.

# Steps

1. Change the title of your report from "CSE 141L Milestone 1" to "CSE 141L Milestone 2".
2. Please make appropriate changes to your Milestone 1 content based off of feedback from the teaching staff. We will release feedback and changes on Gradescope by Tuesday, May 3, 2022. Make sure to update your Changelog with what you have changed.
3. Add your answer to the question "Will your ALU be used for non-arithmetic instructions (e.g., MIPS or ARM-like memory address pointer calculations, PC relative branch computations, etc.)? If so, how does that complicate your design?" to your Programmer Model's section (Section 4). Label this question 4.3.
4. Change the Program Implementation number from 5 to 6.

(more steps on the next page)

1. Copy, paste, and complete the section templates we provide in the following pages to your report. Omit sections that you don't intend on using from your report (e.g. lookup table if you do not have one). We want you to test two modules: the Program Counter (to see if you can perform jumps/branches) and the ALU (to verify you have implementations for your specified instructions). Your report should consist of, *in order*:
2. Team
3. Introduction
4. Architectural Overview
5. Machine Specification
6. Programmer's Model
7. Individual Component Specification
   1. Top Level
   2. Program Counter
   3. Instruction Memory
   4. Control Decoder
   5. Register File
   6. ALU
   7. Data Memory
   8. Lookup Tables
   9. Muxes
   10. (if necessary) other modules - *name sections as appropriate*
8. Program Implementation
9. Changelog

(this page intentionally left blank to avoid confusion)

# Individual Component Specification

## Top Level

Module file name: TODO

### Functionality Description

TODO. Write a brief description of the functionality of this module.

### Schematic

TODO. Show us your schematic for the top level.

## Program Counter

Module file name: TODO

Module testbench file name: TODO

### Functionality Description

TODO. Write a brief description of the functionality of this module.

### (Optional) Testbench Description

TODO. Describe your testbench. How does it work? What test cases does it test?

### Schematic

TODO. Show us your schematic for the fetch unit.

### (Optional) Timing Diagram

TODO. Show us a screenshot of the timing diagram that demonstrates all relevant functions of the fetch unit.

## Instruction Memory

Module file name: TODO

### Functionality Description

TODO. Write a brief description of the functionality of this module.

### Schematic

TODO. Show us your schematic for the fetch unit.

## Control Decoder

Module file name: TODO

### Functionality Description

TODO. Write a brief description of the functionality of this module.

### Schematic

TODO. Show us your schematic for the control decoder.

## Register File

Module file name: TODO

### Functionality Description

TODO. Write a brief description of the functionality of this module.

### Schematic

TODO. Show us your schematic for the register file.

## ALU (Arithmetic Logic Unit)

Module file name: TODO

Module testbench file name: TODO

### Functionality Description

TODO. Write a brief description of the functionality of this module.

### (Optional) Testbench Description

TODO. Describe your testbench. How does it work? What test cases does it test?

### ALU Operations

TODO. What ALU operations will you be demonstrating? What instructions are they relevant to?

### Schematic

TODO. Show us your schematic for the register file.

### (Optional) Timing Diagram

TODO. Show us a screenshot of the timing diagram that demonstrates all relevant operations you mentioned in the ALU Operations section.

## Data Memory

Module file name: TODO

### Functionality Description

TODO. Write a brief description of the functionality of this module.

### Schematic

TODO. Show us your schematic for the data memory.

## Lookup Tables

Module file name: TODO

### Functionality Description

TODO. Write a brief description of the functionality of this module.

### Schematic

TODO. Show us your schematic(s) for the lookup table(s).

## Muxes (Multiplexers)

Module file name: TODO

### Functionality Description

TODO. Write a brief description of the functionality of this module.

### Schematic

TODO. Show us your schematic for your mux(es).

## Other Modules (if necessary)

Module file name: TODO

### Functionality Description

TODO. Write a brief description of the functionality of this module.

### Schematic

TODO. Show us your schematic for your module.

# Changelog

TODO. have a bulleted list of your changes here. Example below:

* Milestone 2
  + Introduction
    - edited to change from a load/store architecture to accumulator architecture.
  + TODO: add bullet points as necessary
* Milestone 1
  + Initial version