

Performance Modeling - RISC-V processor

This will be an INDIVIDUAL project

Phase 1: (Due November 7th 11:59PM)

- 1) Draw the schematic for a single stage processor and fill in your code in the provided file to run the simulator.
- 2) Measure and report average CPI, Total execution cycles, and Instructions per cycle by adding performance monitors to your code. Make sure you output these values to a file.
- 3) What optimizations or features can be added to improve performance? (Extra credit)

Your code will be tested against 10 test cases. 3 of which will be released 5 days prior to your submission. (2nd November)

Notes:

1. **Please modify the existing code to use the correct way to handle folder paths. (Use `os.path.join()` instead of hardcoding OS dependent forward/back slashes).**
2. You'll only submit a zipped folder named `netID.zip`

Make sure you follow the folder structure shown below.

Your code will be in one folder named `netID` with an entry point file (`main.py` or `main.cpp`).

There'll be a second folder called `input/` with each subfolder named `testcase0/`, `testcase1`, etc., and each of these test cases will contain 2 files, `imem.txt` and `dmem.txt`.

After running your code, a third folder should be created as an output folder with the name `output_netID/` with subfolders named `testcase0/`, `testcase1`. Each subfolder must contain 4 files: `PerformanceMetrics_Result.txt`, `SS_DMEMResult.txt`, `SS_RFResult.txt`, `StateResult_SS.txt`.

3. A sample test case is already on brightspace under the project section.

Project root

```
|
|_ input/
|   |_ testcase0
|       |_ _imem.txt
|       |_ _dmem.txt
|   |_ testcase1
|       |_ _imem.txt
|       |_ _dmem.txt
|   |_ testcasen
|       |_ _imem.txt
|       |_ _dmem.txt
|
|_ netID/
|   |_ main.py (or) main.cpp
|   |_ additional_folders_and_files
|   |_ README (in case there's anything you want to mention about your code/dependencies)
|
|_ output_netID/
|   |_ testcase0
|       |_ PerformanceMetrics_Result.txt
|       |_ SS_DMEMResult.txt
|       |_ SS_RFResult.txt
|       |_ StateResult_SS.txt
|
|   |_ testcasen
|       |_ PerformanceMetrics_Result.txt
|       |_ SS_DMEMResult.txt
|       |_ SS_RFResult.txt
|       |_ StateResult_SS.txt
```