

Supplementary

What will we test

We will run these tests

```
HW3
|-- ALU                                     // Part 1
|   |-- alu.f                             <-- specify the files you use
|   '-- codes                             <-- put all the *.v here
|       '-- alu.v
|   -- test_alu                           <-- run the test
|   -- testbench.v                       <-- test for correctness
|-- testcases/                             <-- testcases
|   '-- generate.cpp                       <-- used to generate testcases
|-- FPU                                     // Part 2
|   |-- fpu.f
|   '-- codes
|       '-- fpu.v
|   -- test_fpu
|   -- testbench.v
|   '-- testcases/
|       '-- generate.cpp
|-- CPU                                     // Part 3
|   |-- cpu.f
|   '-- codes
|       |-- instruction_memory.v         <-- instruction memory with access latency
|       |-- data_memory.v               <-- data memory with access latency
|       '-- cpu.v
|   -- test_cpu
|   -- testbench.v
|-- testcases/
|   |-- generate.s
|   '-- generate.cpp
```

How we score

```
=====
Test #0: Correct!
Test #1: Correct!
Test #2: Correct!
Test #3: Correct!
ALL PASS!
Finish flip test.
=====
Test #0: Correct!
Test #1: Correct!
Test #2: Correct!
Test #3: Correct!
ALL PASS!
Finish reverse test.
=====
Finish all tests.
Score: 30.0/30.0
```

alu

```
ALL PASS!
Finish add test.
=====
Test # 0: Correct!
Test # 1: Correct!
Test # 2: Correct!
Test # 3: Correct!
Test # 4: Correct!
Test # 5: Correct!
Test # 6: Correct!
Test # 7: Correct!
Test # 8: Correct!
Test # 9: Correct!
ALL PASS!
Finish mul test.
=====
Finish all tests.
Score: 20.0/20.0
```

fpu

```
VCD info: dumpfile cpu.vcd opened for output.
Load test
Check memory
Correct!
VCD info: dumpfile cpu.vcd opened for output.
Add sub test
Check memory
Correct!
VCD info: dumpfile cpu.vcd opened for output.
And or xor test
Check memory
Correct!
VCD info: dumpfile cpu.vcd opened for output.
Andi ori xori test
Check memory
Correct!
VCD info: dumpfile cpu.vcd opened for output.
Slli srli test
Check memory
Correct!
VCD info: dumpfile cpu.vcd opened for output.
Bne beq test
Check memory
Correct!
```

cpu

You can test cpu testcase one by one

```
iverilog -D T0 -f cpu.f  
vvp ./a.out
```

```
iverilog -D T1 -f cpu.f  
vvp ./a.out
```

```
iverilog -D T2 -f cpu.f  
vvp ./a.out
```

```
iverilog -D T3 -f cpu.f  
vvp ./a.out
```

```
iverilog -D T4 -f cpu.f  
vvp ./a.out
```

```
iverilog -D T5 -f cpu.f  
vvp ./a.out
```

```
iverilog -D T6 -f cpu.f  
vvp ./a.out
```

```
iverilog -D T7 -f cpu.f  
vvp ./a.out
```

About instruction_memory.v

- We will read the testcase to instruction memory at the beginning
- The starting address of instructions is 0.
- You should send 64-bit address and one cycle valid signals to fetch instructions.
- The 32-bit instruction will be fetched 5 cycles later.

About data_memory.v

- Switch to read mode when MemRead is high
- Switch to write mode when MemWrite is high
- Do not read and write memory simultaneously
- The data will be read 5 cycles later.
- The data will be written 7 cycles later.

Submit format

- Please put your files in the following format. And upload as a **zip** file

```
r09922028                <-- zip this folder
|-- ALU
|   |-- codes/
|   |   '-- *.v  <-- files you used
|   '-- alu.f    <-- list all the files needed
|-- FPU
|   |-- codes/
|   |   '-- *.v  <-- files you used
|   '-- fpu.f    <-- list all the files needed
|-- CPU
|   |-- codes/
|   |   '-- *.v  <-- files you used
|   '-- cpu.f    <-- list all the files needed
'-- report.pdf
```

Deadline

- 2020/11/27 21
- Please start working on this homework as soon as possible