**Module Descriptions**

✓***Register File:***

***Ports:***

***Inputs:***

* Write Select
* Write enable
* 3 read selects
* Write Data
* Clock

***Outputs:***

* 3 registers

***Details:***

32 registers, 64-bits each

There can be 3 reads *(2or3 64-bit registers can be read)* and 1 *write (1 64-bit value can be written when write enable is asserted)* each cycle.

*Data forwarding* must be used so that a write and read to the same register returns the new value for the read.

***Program Counter (Instruction Select)***

***Inputs:***

* Clock

***Output:***

* Instruction Address

***Decoder***

***Inputs:***

* 24-bit Instruction
* Clock

***Outputs***

* Depends (TBD)

✓***Instruction Memory***

***Ports:***

***Inputs:***

* Instruction Select (PC)
* Clock

***Outputs:***

* 24-bit Instruction

***ALU***

***Ports:***

***Inputs:***

* 3 (64-bit) Reg. Inputs
* Opcode (4 bits)

***Outputs:***

* Data output (Calculation)

***Details:***

13 different kinds of ALU operations (for R-3 instruction format)