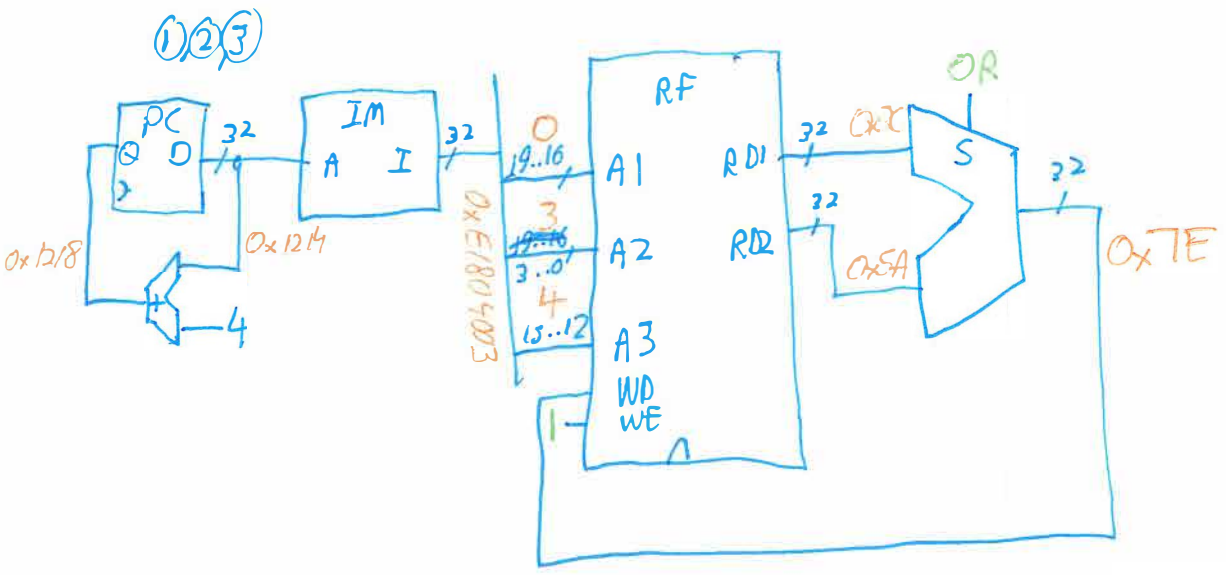


CE-1921 - Dr. Durant - Quiz 5
Spring 2018, Week 5

- (4 points) Draw the ARM single-cycle processor designed in lecture that can execute (at least) eor using (just) a (possibly shifted, but ignore this) register for the second operand (e.g., "orr r4, r0, r3"). Label bit numbers as needed. Include control inputs. Include clock inputs only where needed. You do **not** need to include which bits (op, etc.) of the instruction feed to control unit.
- (2 points) On your drawing above, label all **data** path inputs that are required to successfully complete the instruction orr r4, r0, r3.
- (2 points) List all the **control** signals for your processor above and indicate what their values (you can use symbolic values, e.g., "add" to indicate an ALU is set to add) must be when executing the instruction from the previous problem.
- (2 points) State the execution time equation. Remember that time is the product of three terms.

blue
orange
green

values (except PC & the machine lang. instr.)
giving mach. code
0x1214, 0x1804003
PC = 0x1214



This is the minimal answer. It is okay to add MUXes, sign extenders, data memory, etc.

(4)
$$T_{ex} = IC \times CPI \times T$$

↑ ↑ ↑ ↑
 execution time instr. count clocks per instr. time per clock = 1/f_{clock}