

Description of the pipelineRegister circuit files for Labs 8 –Pipeline CPU

The pipeline registers are designated by a number indicating which stages they bridge and a descriptor indicating the information stored at that stage.

- 1 indicates the IF/ID register
- 2 indicates the ID/EX registers
- 3 indicates the EX/Mem registers
- 4 indicate the Mem/WB registers

- PC indicates the address information needed to compute branch and jump PC addresses
- Ctrl indicate control lines
- DP indicates the main data-path
- ALUCtrl indicates the ALU control bits going to the ALU
- Rd indicates the destination register for write-back

The initial file is pipelineRegisters.circ. It includes the following completed pipeline registers which are used in PipelineARM-CPU1-start.circ:

PipeReg1 (only one pipeline register needed here for PC and Instruction)

PipeReg2PC (stores PC)

PipeReg2Ctrl (stores all control values)

PipeReg2DP (stores data path values from A-reg, B-reg, and extended immediate)

PipeReg2ALUCtrl/Rd (ALU control bits and possible destination register rd)

You need to complete this file by determining what pipeline registers will be needed between the EX and MEM stages, labeled PipeReg3x, and what pipeline registers will be needed between the MEM and WB stages, labeled PipeReg4x, where the x is replaced by an appropriate designation.