

2. Processor Design (25 Points).

Modify the single-cycle datapath on the following page to include the **minc** instruction. A **minc** instruction reads the word pointed to by the src register, increments it by one, and stores it back into the src register. Specifically, it performs the following rtl:

$$R[rs] \leftarrow M[R[rs]] + 1$$

Assume that **minc** uses the I-format. Your modifications can include: severing wires, assigning wires values, adding mux inputs, adding wires, and duplicating any component in the below diagram (and adding corresponding control signals). Assign values to each control signal (both old and new).

Control Signal	Value
RegDst	X
RegWrite	1
ALUSrc	0
ALUOp	Add
PCSrc	0
MemWrite	0
MemRead	1
MemtoReg	1
Minc	1

