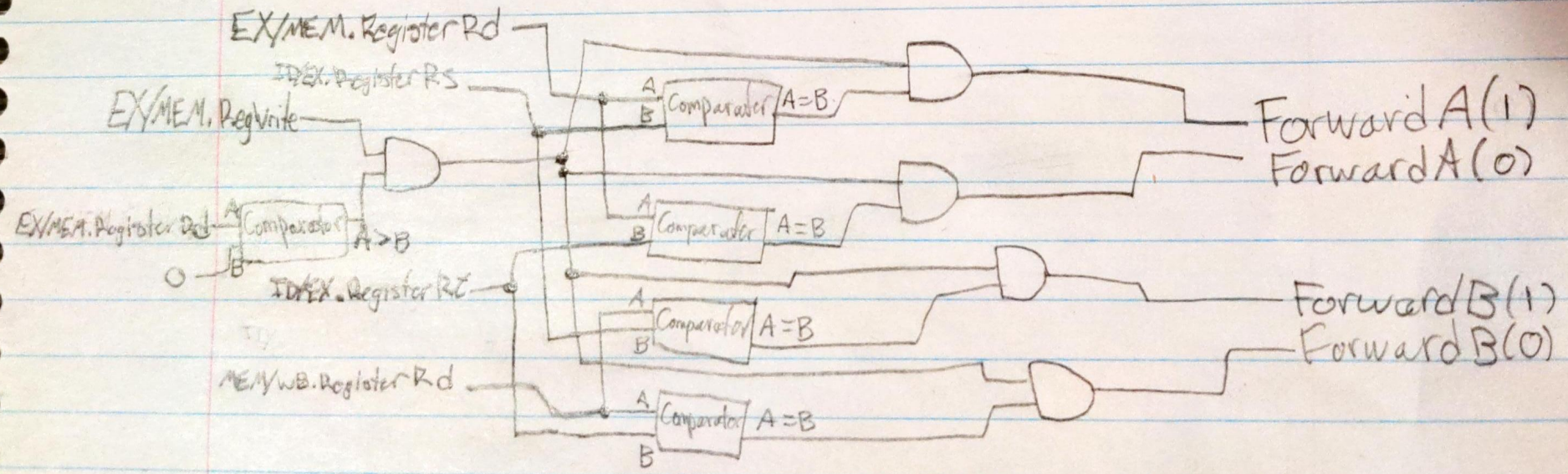
Forwarding Unit

Equations:

1. (EX/MEM.RegWrite & (EX/MEM.RegisterRd ≠ 0) & (EX/MEM.RegisterRd = ID/EX.RegisterRs))
   = ForwardA = 10 . ALUA = Prior ALU result
2. (EX/MEM.RegWrite & (EX/MEM.RegisterRd ≠ 0) & (EX/MEM.RegisterRd = ID/EX.RegisterRt))
   = ForwardB = 10 . ALUB = Prior ALU result
3. (EX/MEM.RegWrite & (EX/MEM.RegisterRd ≠ 0) & (MEM/WB.RegisterRd = ID/EX.RegisterRs))
   = ForwardA = 01 . ALUA = Data Memory or Prior ALU result
4. (EX/MEM.RegWrite & (EX/MEM.RegisterRd ≠ 0) & (MEM/WB.RegisterRd = ID/EX.RegisterRt))
   = ForwardB = 01 . ALUB = Data Memory or Prior ALU result



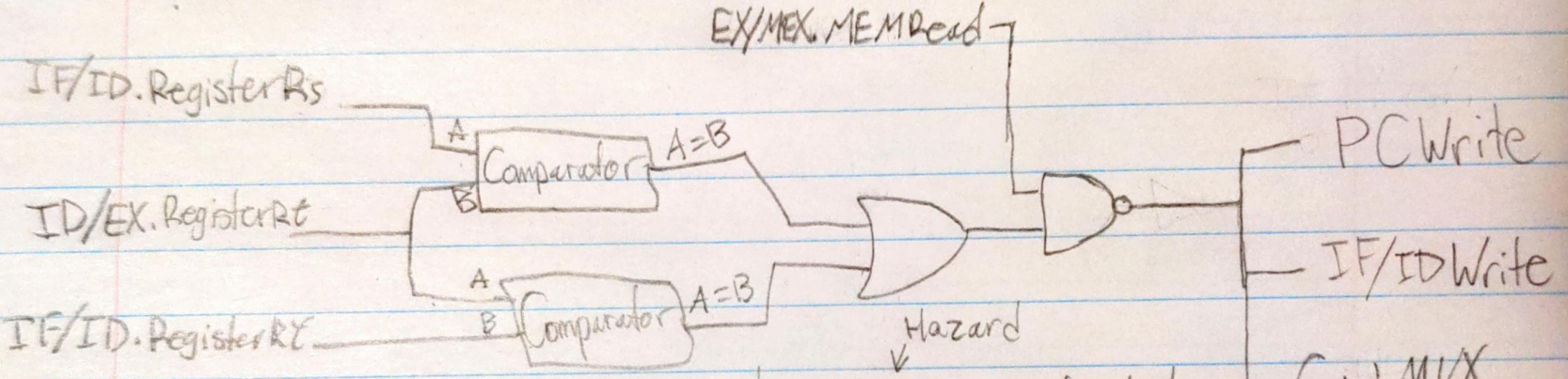
Hazard Detection Unit

Equation:

Hazard Detection Unit

Equation:

1. (EX/MEM.MemRead & ((ID/EX.RegisterRt = IF/ID.RegisterRs) or (ID/EX.RegisterRt = IF/ID.RegisterRt)))



PCWrite = 1 : PC increments, else is held

IF/IDWrite = 1 : IF/ID is written to, else is stalled

CtrlMUX = 1 : Control signals from CU, else Flushed with Zeros

* PCWrite, IF/IDWrite, and CtrlMUX are active high signals. Want them to be high Hilroy unless there is a hazard