Lab2
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CS 301
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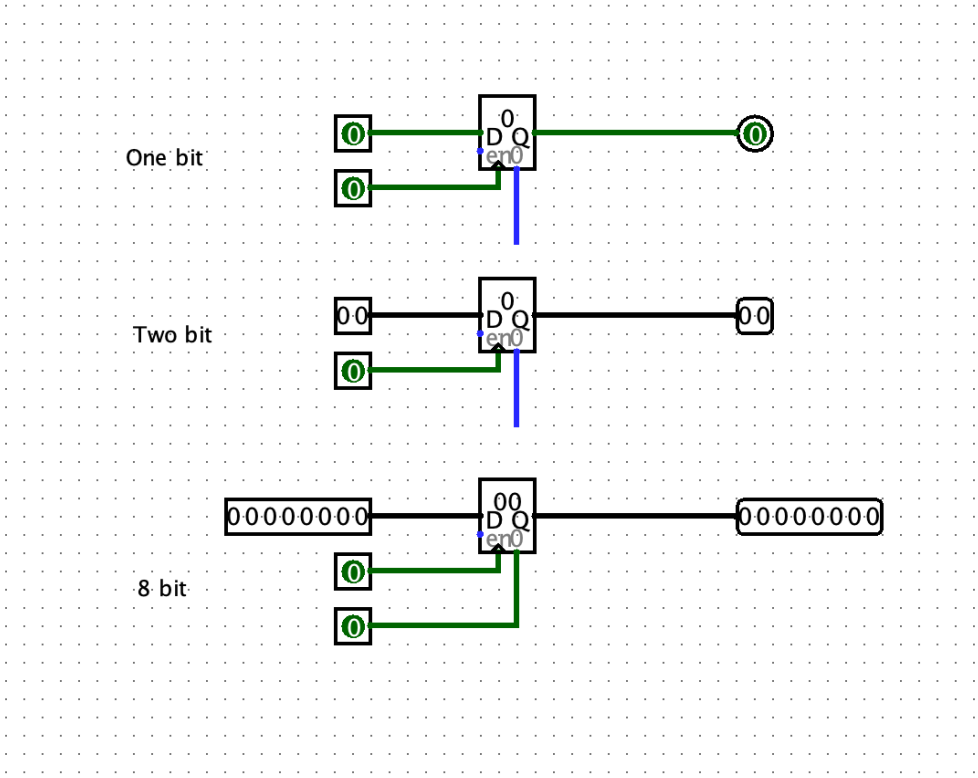
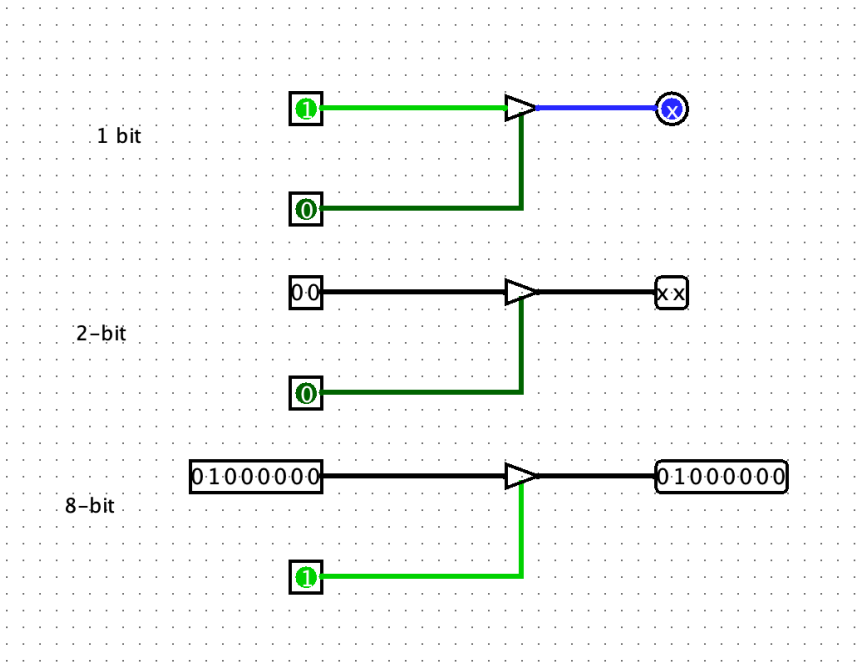
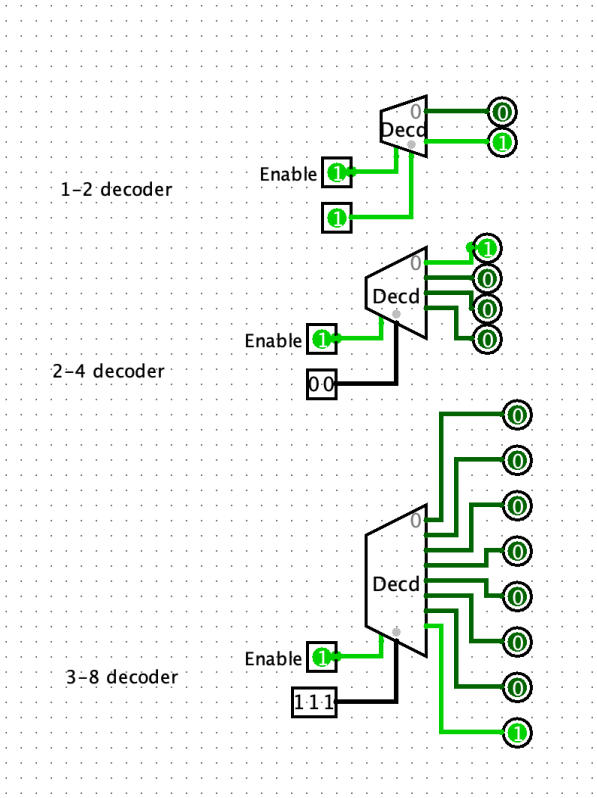
Register testing



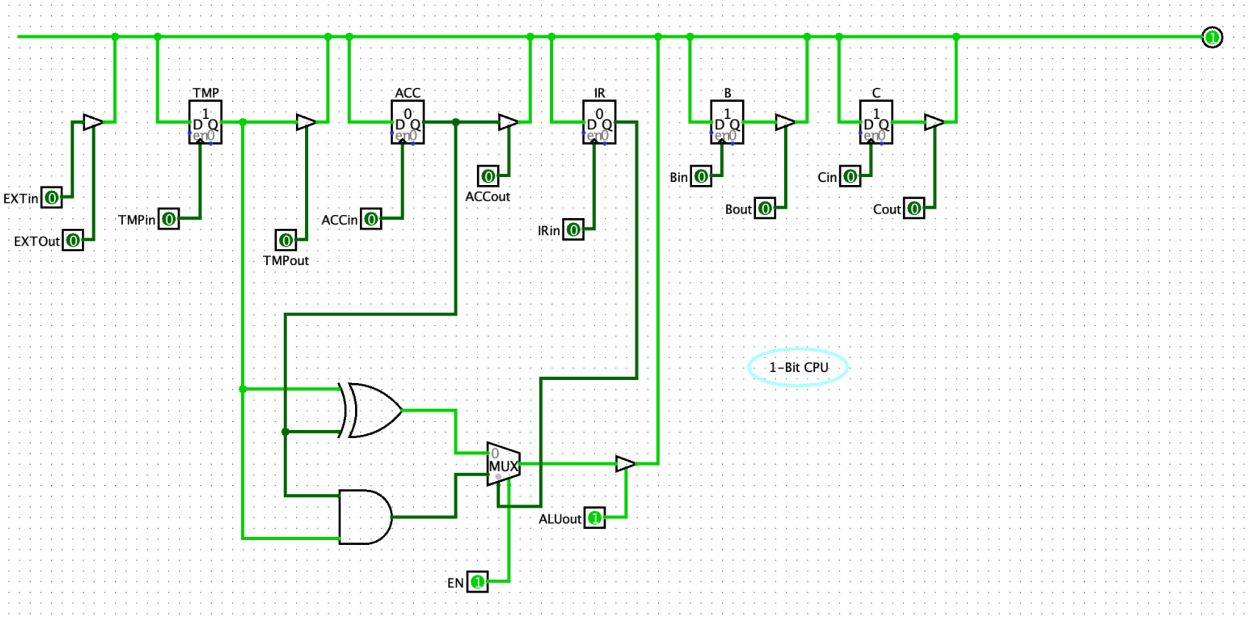
Buffer testing



Decoder testing



1 bit cpu



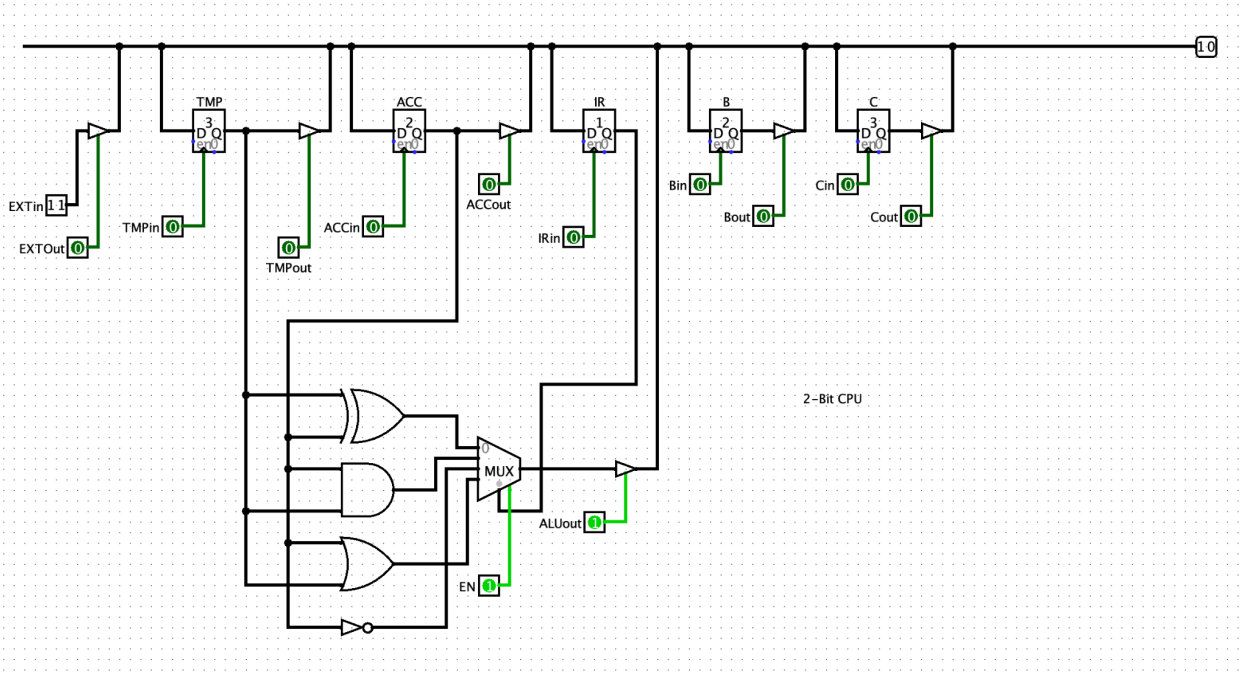
1 Bit CPU

What are control signals EXTin, EXTout and Cin for?
EXTin: The value for the EXT buffer. This is used to pass in external values
EXTout: The ‘enable’ for the EXT buffer. When 1, output EXTin, when 0, output X
Cin: This is the ‘enable’ for register C. When 1, it will load from the bus.

Write out the steps necessary to implement the operation **XOR** that uses the operands in the register ACC and register C, and then stores the result in register B.

1. EXTin, EXTout, IRin. // Load '0' in register IR for XOR operation.
2. EXTin, EXTout, ACCin. // Load '0' in register ACC.
3. EXTin, EXTout, Cin. // Load '1' in register C.
4. Cout, TMPin.
5. ALUout, Bin. // Store result in register B

2 bit CPU



2 Bit CPU

For instruction 00, do 2-bit **XOR**, test 10 XOR 11 = 01
Do the XOR operation with the values in register B and C, and store the result in C.

1. EXTin, EXTout, IRin. // Load '0' in register IR for XOR operation.
2. EXTin, EXTout, Bin. // Load '10' in register B.
3. EXTin, EXTout, Cin. // Load '11' in register C.
4. Cout, TMPin. // Load contents of C into TMP
5. Bout, ACCin. // Load contents of B into ACC
6. ALUout, Cin. // Store result in register C

For instruction 01, do 2-bit **AND**, test 10 AND 11 = 10
Do the AND operation with the values in register B and C, and store the result in B.

1. EXTin, EXTout, IRin. // Load '01' in register IR for AND operation.
2. EXTin, EXTout, Bin. // Load '10' in register B.
3. EXTin, EXTout, Cin. // Load '11' in register C.
4. Cout, TMPin. // Load contents of C into TMP
5. Bout, ACCin. // Load contents of B into ACC
6. ALUout, Bin. // Store result in register B

For instruction 10, do 2-bit **NOT**, test NOT 10 = 01
Do the NOT operation with the value in register C and store the result in register B.

1. EXTin, EXTout, IRin. // Load '10' in register IR for NOT operation.
2. EXTin, EXTout, Cin. // Load '10' in register C.
3. Cout, ACCin. // Load contents of C into ACC
4. ALUout, Bin. // Store result in register B

For instruction 11, do 2-bit OR, test 10 OR 11 = 11
Do the OR operation with the values in register B and TMP, and store the result in C.

1. EXTin, EXTout, IRin. // Load '11' in register IR for OR operation.
2. EXTin, EXTout, Bin. // Load '10' in register B.
3. EXTin, EXTout, TMPin. // Load '11' in register TMP.
4. Bout, ACCin. // Load contents of B into ACC
5. ALUout, Cin. // Store result in register C