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In this project,i gather knowledge about Build a full single cycle datapath.Firstly,I take D-mux which has write enable and RD is the part of register.Then,I take 16 register which is connected by enable pin with D-mux.In register,there is two more button for reset and clock.Then I take,two mux for reading data 1 nad 2 and two selector RS and RT which is mainly the part of resgister.
Then I make 3 more file for R type,I type and lw/sw.Then I make instruction fetch which is consist of adder and Rom .Rom is used for giving instruction like OP,RS,RT,RD .Then I take the ic of register file .Then I connect everything like RS,RT,RD. After that I take the ic of 16 bit Alu from my project then I connect the result of Alu with the data input of register file which is used for writing.By the help of clock plus ,I can write the data in register file which is mainly R type.

For making I type, Then I make instruction fetch which is consist of adder and Rom .Rom is used for giving instruction like OP,RS,RT,RD .Then I take the ic of register file .Then I connect everything like RS,RT,RD.RD for immediate value and Rs is for selecting register which one I use for input. After that I take the ic of 16 bit Alu from my project then I connect the result of Alu with the data input of register file which is used for writing.By the help of clock plus ,I can write the data in register file which is mainly I type.

For doing lw/sw I use same I type,but I add a ram which is connected by AlU output wire and read data two which is use for sw.we use lw for wrting value in register and we use sw for storing value in memory.Then I take another file which is mainly merge the I type,R type,lw/sw file.For doing this task,I use 3 mux,first mux is used for which operation I will do like R type or I type.we will select the 0 for I type and 1 for R type.For 2^{nd} mux which is mainly use for selecting immediate value and read data 2.For seleting read data 2 ,I use 0 and 1 for immediate value.I use mux three for selecting lw and add/sub . if I select 0 which is working for add/sub and other thing and 0 for lw operation.

Then I design truth table for making main control.By the help of truth table,I build the main control circuit.Then The table is given below:

Instru-tino	opcode	Regdst	ALUsrc	MemtoReg	Reg write	Mem read	Mem write	ALUop
ADD	0000	1	0	0	1	0	0	1000
SUB	0001	1	0	0	1	0	0	1010
Mul	0010	1	0	0	1	0	0	1110
ADDi	0011	0	1	0	1	0	0	1000
SUBi	0100	0	1	0	1	0	0	1010
lw	0101	0	1	1	1	1	0	1000
SW	0110	0	1	x	0	0	1	1000
Nand	0111	1	0	0	1	0	0	0001
Nor	1000	1	0	0	1	0	0	0010
X-or	1001	1	0	0	1	0	0	0011
Nandi	1010	0	1	0	1	0	0	0001
Nori	1011	0	1	0	1	0	0	0010
x-ori	1100	0	1	0	1	0	0	0011
Muli	1101	0	1	0	1	0	0	1110

Then I connect the ic of main control in project part 2.