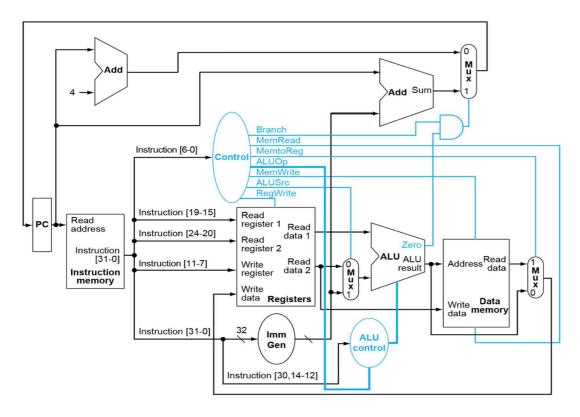
CODING ASSIGNMENT 1

DATAPATH + CONTROL SIGNALS



EXPLANATION:

I based the processor datapath entirely off of the example set out in Module 3 (Slide 95). To accommodate for the operations we haven't gone over distinctly like SRAI and JAL, I added ALUOp codes and left the calculations to the Controllers (Instruction and ALU). I didn't add different control inputs, only more options in the existing control signals. I also took out the (Shift Left) from the ImmGen and kept it internal to the function.

Introduction Decode

Instruction	Opcode	RegWrite	AluSrc	Branch	MemRe	MemWr	Mem2Reg
R-Type	0110011	1	0	0	0	0	0
I-Type	0010011	1	1	0	0	0	0
l(w/b)	0000011	1	1	0	1	0	1
s(w/b)	0100011	0	1	0	0	1	0
beq	1100011	0	0	1	0	0	0
jal	1101111	1	0	1	0	0	0

ALUOps from the main controller

Instruction opcode	ALUOp		
Load	00		
Store	00		
BEQ	01		
Jump	11		
R-Type	10		
I-Type	10		
U-Type	10		

ALU Control Input

Funct7 field	Funct 3	ALU Action	ALU Control Input
XXXXXXX	XXX	add	0010
XXXXXXX	XXX	add	0010
XXXXXXX	XXX	subtract	0110
0000000	000	add	0010
0100000	000	subtract	0110
0000000	111	AND	0000
0000000	110	OR	0001
0000000	100	XOR	0011
0100000	101	Shift Right	0100
XXXXXXX	XXX	LUI	1000
XXXXXXX	XXX	JAL	1111