Course: Computer Organization – ENCM 369
Lab #: Lab 7
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Lab Section: B03
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Exercise A

Part 1

RegWrite	ImmSrc	ALUSrc	MemWrite	ResultSrc	PCSrc	ALUControl
1	00	1	0	1	0	000

A1	A2	A3
01010	01000	01001

SrcA	SrcB	ALUResult	Result	PCNext
0x1001_0030	0x0000_0008	0x1001_0038	0x0003_4567	0x0040_00d0

WD3
0x0003_4567

Part 2

RegWrite	ImmSrc	ALUSrc	MemWrite	ResultSrc	PCSrc	ALUControl
1	xx	0	0	0	0	010

A1	A2	A3
01011	00101	11101

SrcA	SrcB	ALUResult	Result	PCNext
0x0002_468a	0x0000_03ff	0x0000_028a	0x0000_028a	0x0040_00e0

WD3
0x0000_028a

Exercise B

RegWrite	ImmSrc	ALUSrc	ALUControl	MemWrite	ResultSrc	PCSrc
1	00	1	000	0	0	0

A1	A2	A3
00111	00000	00111

SrcA	SrcB	ALUResult	Result	PCNext
0x0000_00c0	0xffff_ffa0	0x0000_0060	0x0000_0060	0x0040_00a8

WD3
0x0000_0060

Exercise C

Instruction	Opcode	RegWrite	ImmSrc	ALUSrc	TargetSrc	MemWrite	ResultSrc	Branch	ALUOp	Jump
lw	0000011	1	00	1	x	0	01	0	00	0
sw	0100011	0	01	1	x	1	xx	0	00	0
R-type	0110011	1	xx	0	x	0	00	0	10	0
beq	1100011	0	10	0	1	0	xx	1	01	0
I-type ALU	0010011	1	00	1	x	0	00	0	10	0
jal	1101111	1	11	x	1	0	10	x	xx	1
jalr	1100111	1	00	1	0	0	10	x	10	1

RegWrite – 1 because we're writing PCPlus4 to the R-File.

ImmSrc – 00 because it is an I-type instruction.

ALUSrc – 1 because we need to use the result from Extend in ALU.

TargetSrc – 0 because we need to use ALUResult for the PCTarget.

MemWrite – 0 because we don't want to write anything to D-Mem.

ResultSrc – 10 because we need PCPlus4 to be written to the R-File.

Branch – x because Jump is 1.

ALUOp – 10 because it's like addi where we add an immediate value to rs1.

Jump – 1 because PCSrc must be 1 to use PCTarget for PCNext.