

CS 315-02 Processor Branches RAM 2025-11-06

Lab10

part1 : addi (li) , add , unimp

part2 : jal (call,j) , jalr (ret)

Submit:

lab10-part1.dig → inst-decode-part1.dig

lab10-part2.dig → inst-decode-part2.dig

PDF of your spreadsheet

Delete unused rows

Select Workbook and all sheets

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Remaining concepts and instructions

Branches

Data Memory (loads/stores)

Program / Code initialization

Remaining instructions

Data Processing		Control	Memory	
addi	sll	jnl jnlr	lb	sb
add	sra	beq	lw	sw
sub	slli	one	ld	sd
mul	srai	blt		
		bge		

Branching

beq t_0, t_1, label

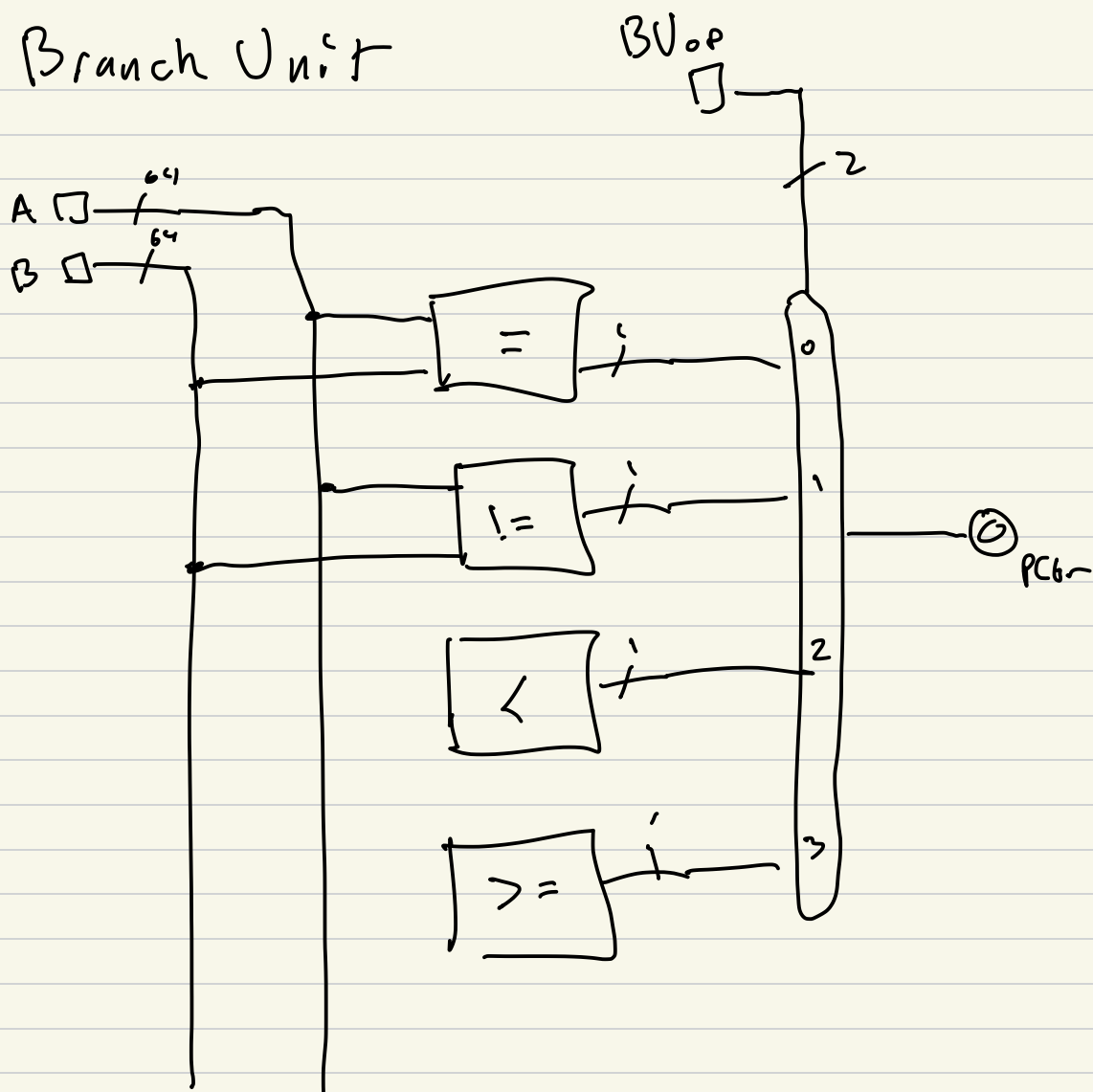
1) Compute the branch target address (BTA)

$$\text{BTA} = \text{PC} + \text{imm}_6$$

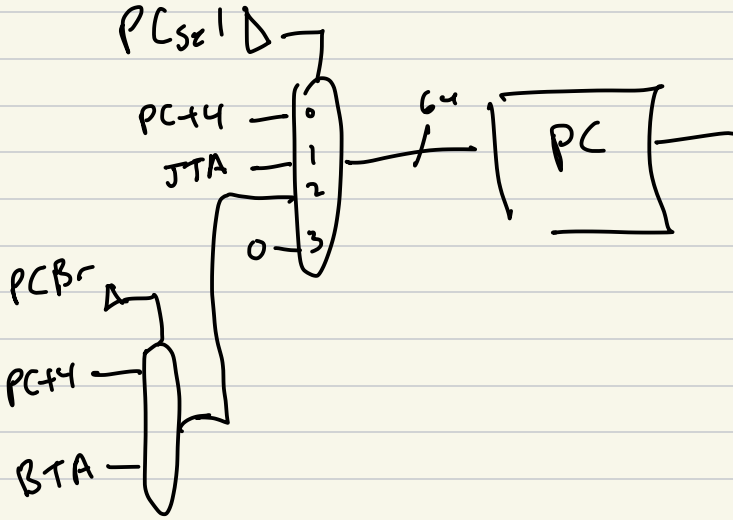
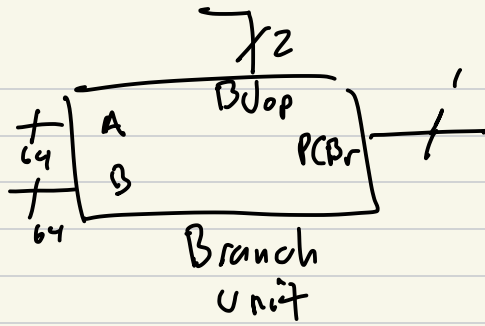
2) Determine if we take the branch by comparing rs_1 to rs_2

3) Update PC to BTA conditionally

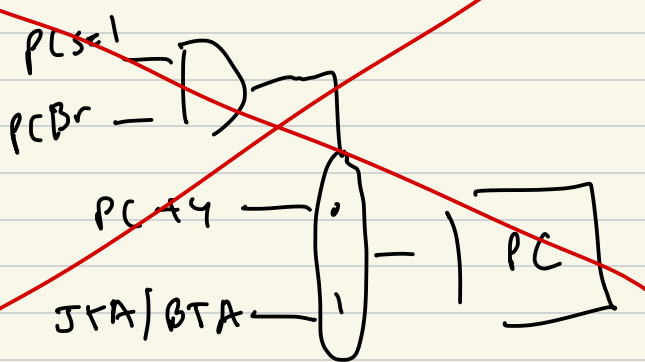
Branch Unit



PCBr
Option #1

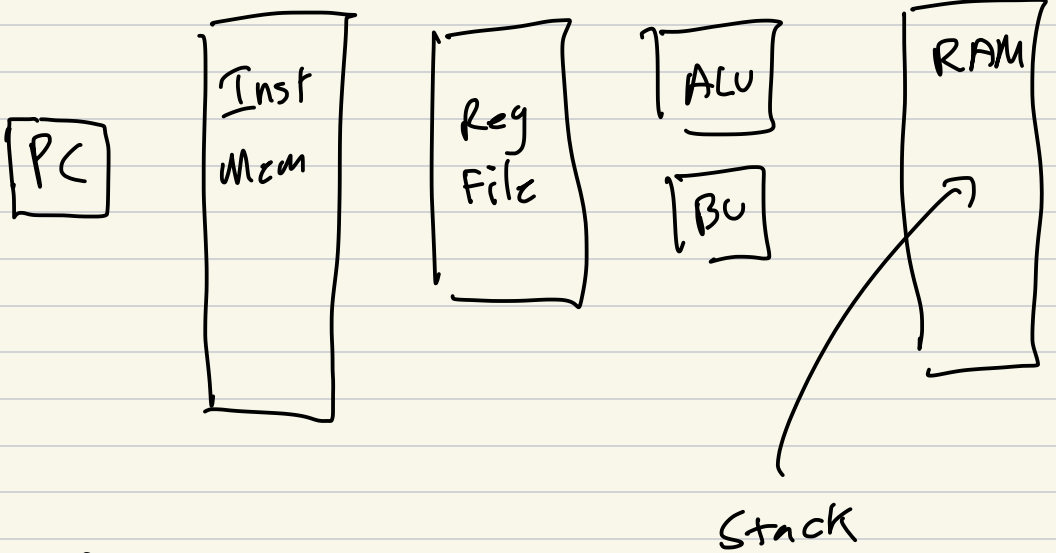


Option #2



Data Memory

Data Memory



$$\underline{2^{10}} = \underline{1024}$$

element size

is 64 bits

or 8 bytes

7 addr bits

$$2^3 = 8$$

$$2^3 \times 2^n = 2^{10}$$

↑

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