

# CS 315-01 Branches and Data Memory

## Lab 06

part 1    addi    add    unimp

part 2    jal    jalr ←  
          fall    ret

Review remaining instructions to implement

Branches (conditional)

Data Memory

Setting up programs to run on our processors

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## Lab 06

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## Remaining Instructions

Data processing

addi    sll  
add     srl  
sub    slli  
mul    srli

...

Control

jal    jalr  
call    ret  
[ beq  
  bne  
  :  
  :]

Memory

[ ld    sd  
  lw    sw  
  lb    sb

# Branching

beq to, t1, label

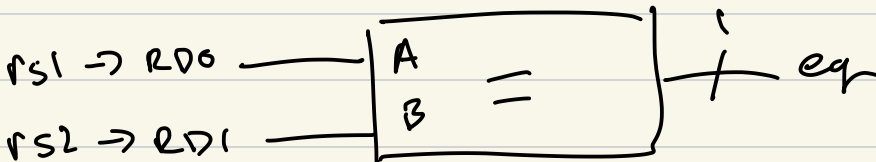
1) compute BTA (branch target address)

$$\text{BTA} = \underline{\text{PC} + \text{imm} - b}$$

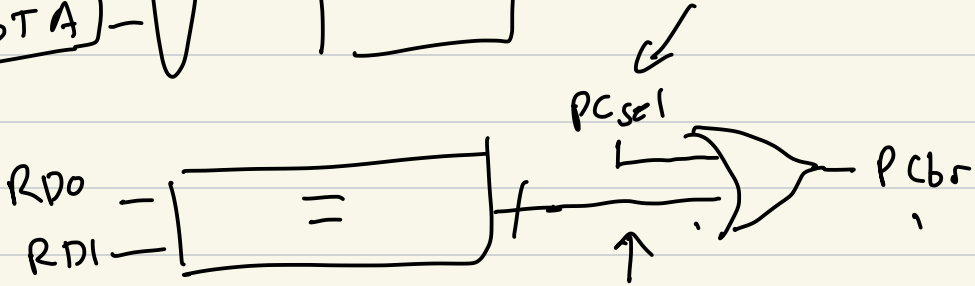
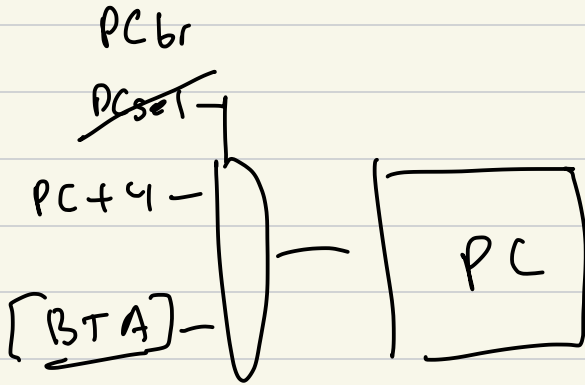
2) Determine if we are going to take the branch

How?

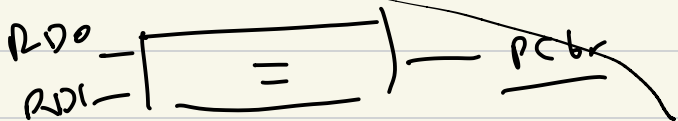
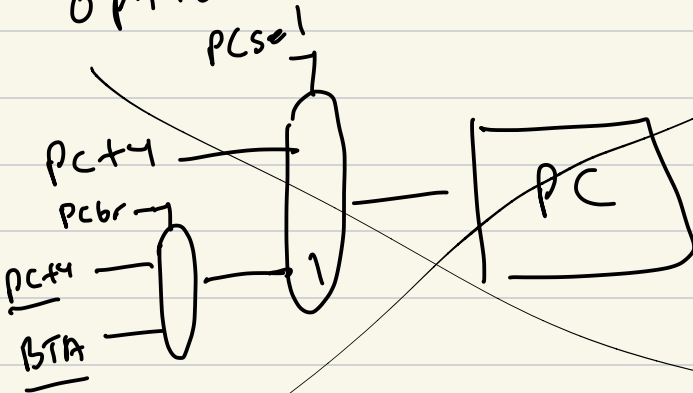
Compare



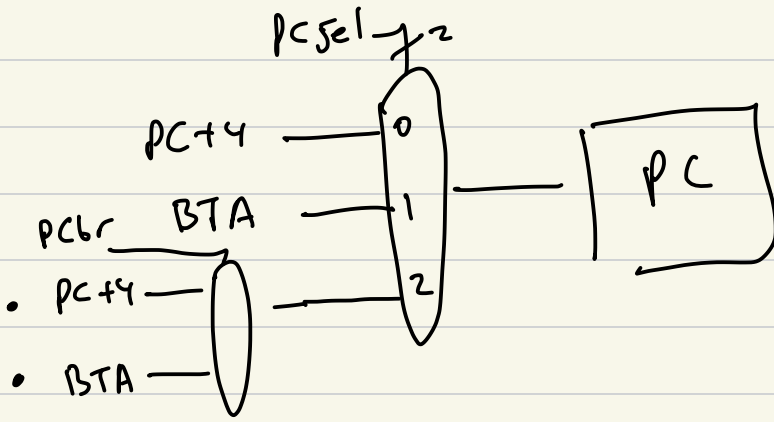
# Option # 1



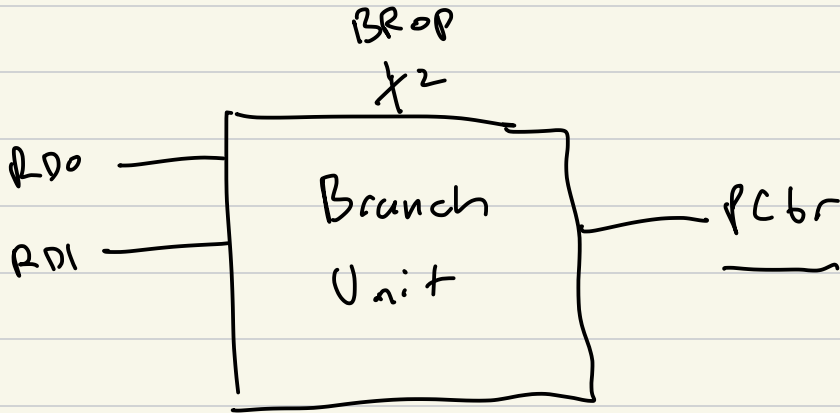
# Option # 2



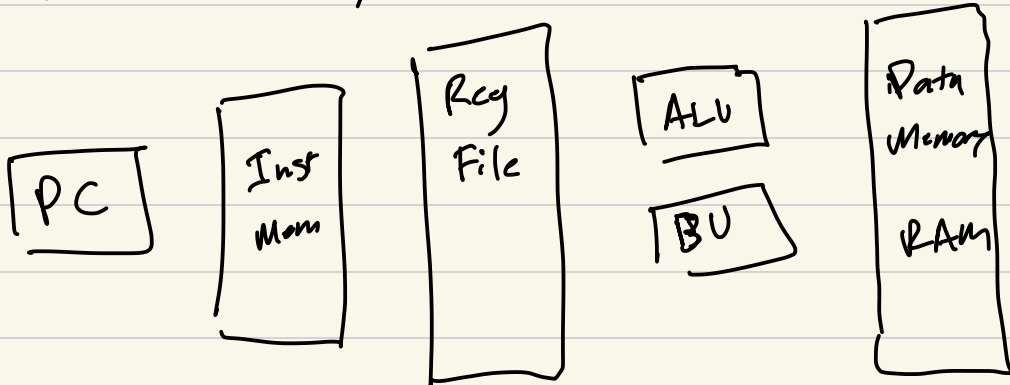
Option #3 \* my favorite



Branch Ops - beq, bne, blt, bgt



# Data Memory



sd / ld  
sw / lw  
sb / lb  
└──┬──  
Stack

# Digital

RAM as data memory  
(stack)

Use 64 databits } 128 doubles  
7 addr bits }

How to load/store words and bytes?  
double

