Question 40

Not yet answered

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Biết rằng sau khi thực hiện xong chương trình hợp ngữ MIPS dưới đây, giá trị của thanh ghi **$s0** là **0x15F**. Hãy điền nội dung phù hợp vào các ô trống để hoàn chỉnh lệnh

```
addi    [   ▼   ]  ,  $zero,    0x15
[   ▼   ]           $t2,   $t3,    4
addi        $s0,    $t2,   [   ▼   ]
```
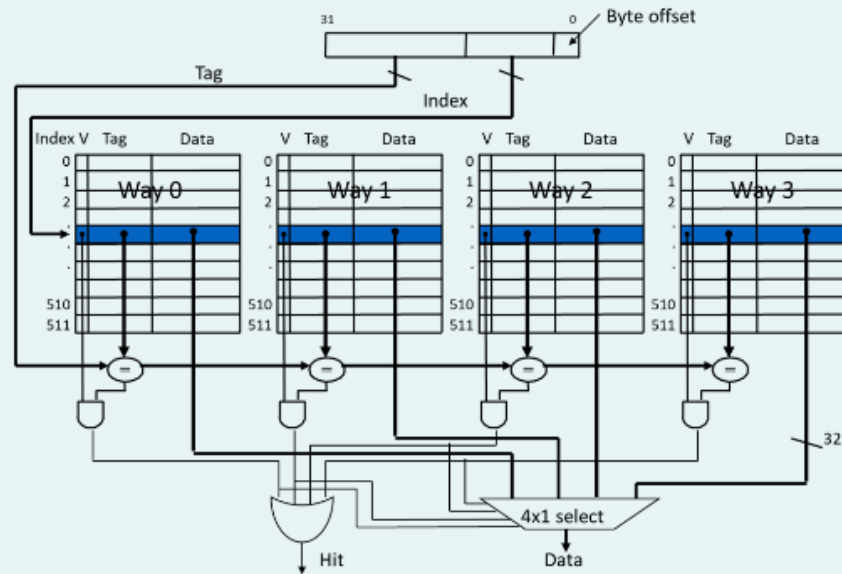
Question **13**

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Given a 4-way set associative cache memory organized as in the following figure. How many blocks are there in this cache?

- ○ a. 2048
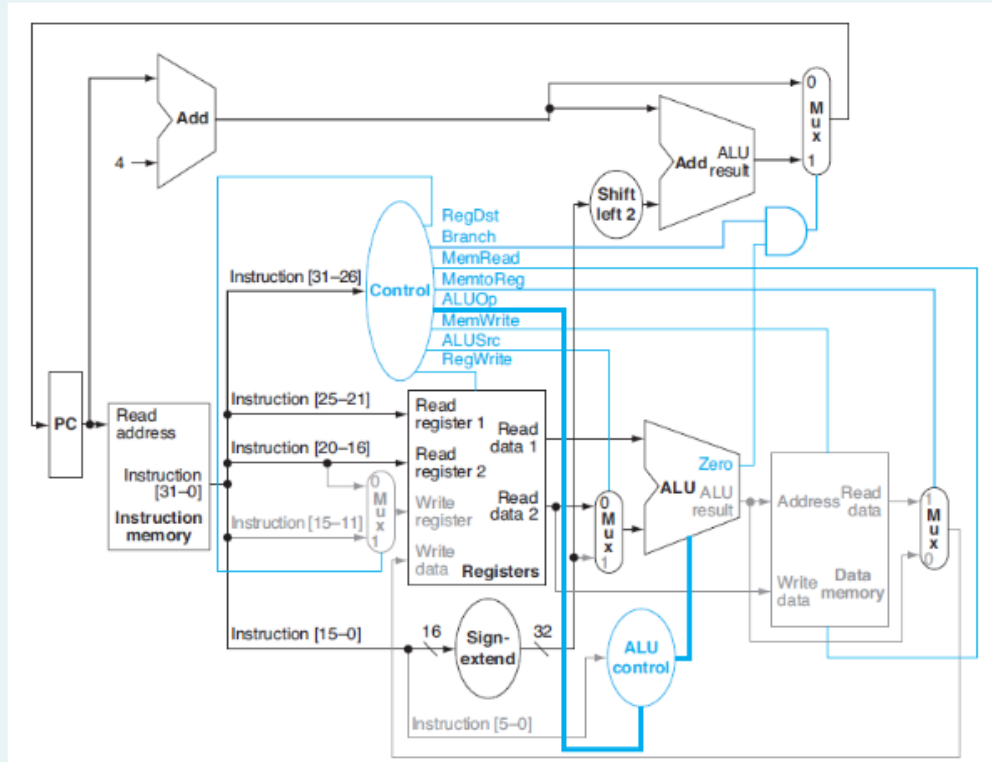- ○ b. 512
- ○ c. 1024
- ○ d. 511

Given a single-cycle MIPS CPU shown below. Which instruction requires the component **Shift left 2?**

- a.   addi $t0, $t1, 2

- b.   lw $s1, 4($s2)

- c.   sll $s1, $s2, 2

- d.   beq $t1, $t2, L1

Clear my choice

Given a 5-stage-pipelined MIPS CPU running a program with dynamic instruction counts as below:

R-type	beq	j	lw	sw
50%	15%	5%	20%	10%

The CPI in the ideal case if no hazard occurred during the program execution should be 1. However as the program consists of many conditional branch instructions, control hazard will occur and actual CPI will increase.

Assume that this CPU uses branch not taken prediction to deal with control hazard, and no other type of hazard will happen. Given the correct branch prediction rate of 80%, and the penalty of wrong prediction is 1 clock cycle. Show the new CPI in this case:

Note: use "." as the decimal separator.

Given a 5-stage pipelined MIPS CPU with clock cycle of **4 ns**, and when no hazard happens its CPI is 1. The CPU has forwarding mechanism (including ALU-ALU and Mem-ALU forwarding paths) to help solve data hazard.

How much time will this CPU take to execute the below program, including pipeline fill-up time?

```
sll   $t0, $s0, 2        # $t0 = 4*j
add   $t0, $s6, $t0      # $t0 trỏ vào A[j]
sll   $t1, $s1, 2        # $t1 = 4*i
add   $t1, $s7, $t1      # $t1 trỏ vào B[i]
lw    $t3, 0($t0)        # $t3 = A[j]
lw    $t4, 4($t0)        # $t4 = A[j+1]
sll   $t4, $t4, 2        #
add   $t5, $t3, $t4      # $t5 = A[j]+4*A[j+1]
sw    $t5, 0($t1)        # B[i] = A[j]+A[j+1]
```

- ○ a. 180.0 ns
- ● b. 36.0 ns
- ○ c. 52.0 ns
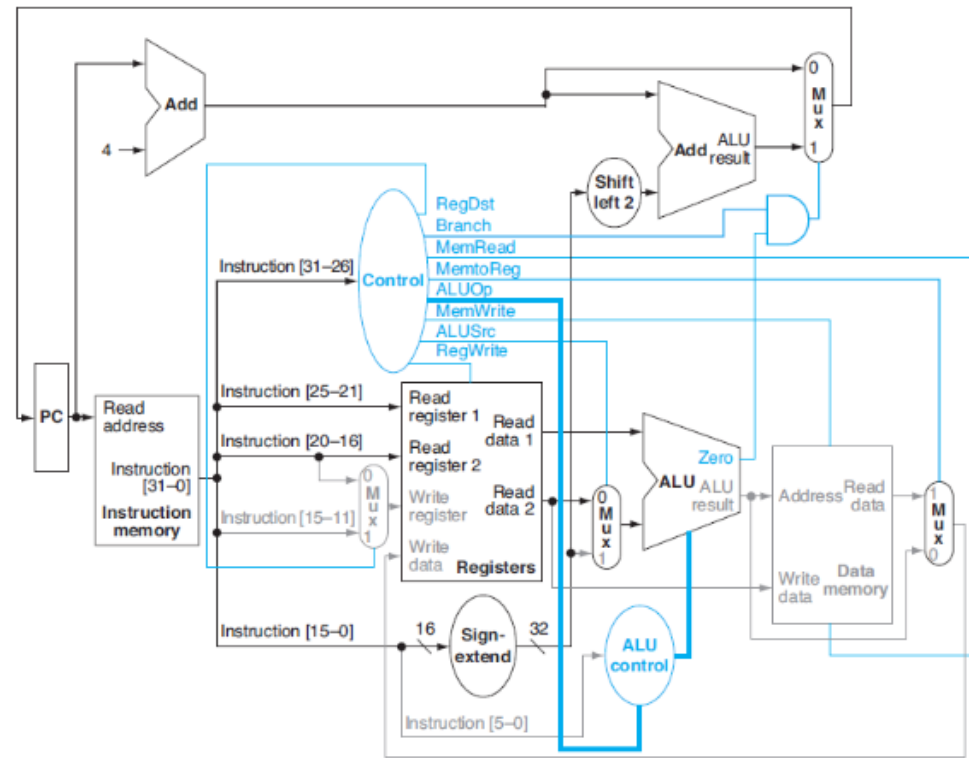- ○ d. 56.0 ns

Clear my choice

Given the single-cycle MIPS CPU below. Which instruction sends **Instruction[15-11]** to **Write register** input?

- ○ a. lw $t0, 0($t1)
- ⦿ b. slt $t1, $s1, $s2
- ○ c. slti $t1, $t0, 3
- ○ d. addi $t0, $t1, 100

Clear my choice
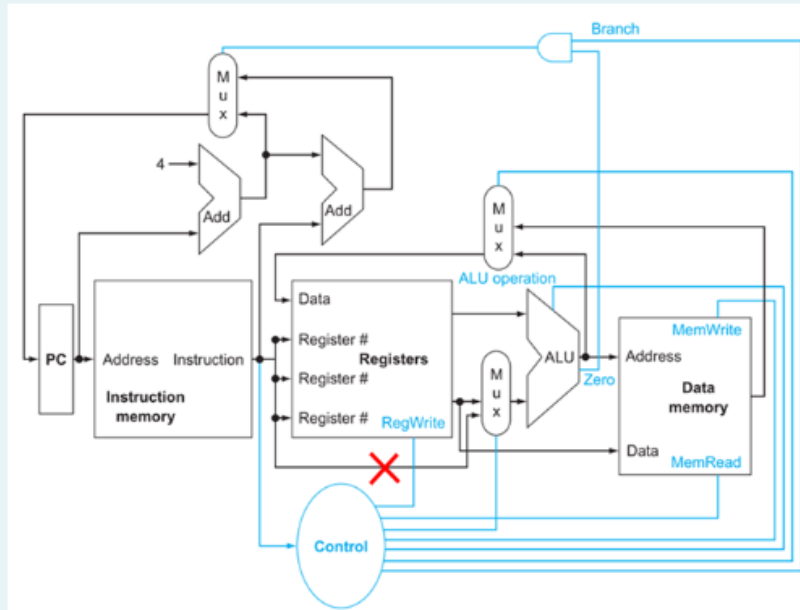
For the MIPS datapath shown below. Select the instruction that **will be affected** if the wire marked with "X" is cut (disconnected).

- a. and $s1, $s2, $s3
- b. sub $s1, $s2, $s3
- c. addi $t1, $t2, 3
- ● d. add $t1, $t2, $t3

Clear my choice

What is the value of register $s5 in decimal system after executing the follow program

```
.data: A: .word 1, 3, 5, 7, 9, 11, 13, 15, 17, 19
.text
    li $s1, 0
    li $s5, 0
    li $s3, 8
    la $s2, A

loop:
add $t1,$s1,$s1
add $t1,$t1,$t1
add $t1,$t1,$s2
lw $t0,0($t1)
add $s5,$s5,$t0
addi $s1,$s1,1
bne $s1,$s3,loop
```

==

What is the value of register $t1 in decimal system after executing the follow program

.text

    li $s1, 902

    li $s2, 1007

    slt $t0,$s1,$s2

    beq $t0,$zero,else

    addi $t1,$s1, 15

    j   endif

else:

addi $t1,$s2, 15

endif:

==

What is the value of Z in decimal system after executing the follow program

```
.data
    X : .word 900
    Y : .word -400
    Z : .word
.text
    la $t8, X
    la $t9, Y
    lw $t1, 0($t8)
    lw $t2, 0($t9)
    sll $s0, $t2, 2
    add $s0, $s0, $t1
    la $t7, Z
    sw $s0, 0($t7)
```

===

What is the value of $s1 in decimal after the following code is executed?

```
li $t0, 1001
li $t1, 2009
add $s1, $t0, $t1
```

==

Given A is an array of 4-byte integers, that has already been allocated in memory. What is the value of A[2] in decimal after the below code is executed?

```
la $s0, A
li $t0, 100
addi $t0, $t0, 0x08
sw $t0, 0x08($s0)
```

==

What is the value of $s1 in decimal after the following code is executed?

```
li $t0, 0x5566
sll $t1, $t0, 1
and $s1, $t0, $t1
```