11 CSCI 3301 Section 03 COMPUTER ARCHITECTURE AND ASSEMBLY LANGUAGE

Started on	Monday, 27 December 2021, 3:36 PM
State	Finished
Completed on	Monday, 27 December 2021, 4:30 PM
Time taken	53 mins 52 secs
Marks	10.18/40.00
Grade	**2.54** out of 10.00 (**25**%)

...ormation

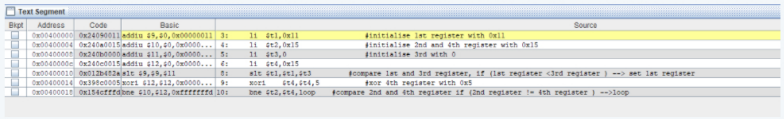
Flag question

https://italeemc.iium.edu.my/pluginfile.php/75700/question/questiontext/106309/1/243646/loop.asm

- Copy and paste this file into MARS. Then execute the program to answer the following questions.
- This asm file is referred to as Program A.
- Make sure the program is available until all 8 questions (from all 3 parts) are answered. You need to refer to this program for all 8 questions.

Information

Flag question



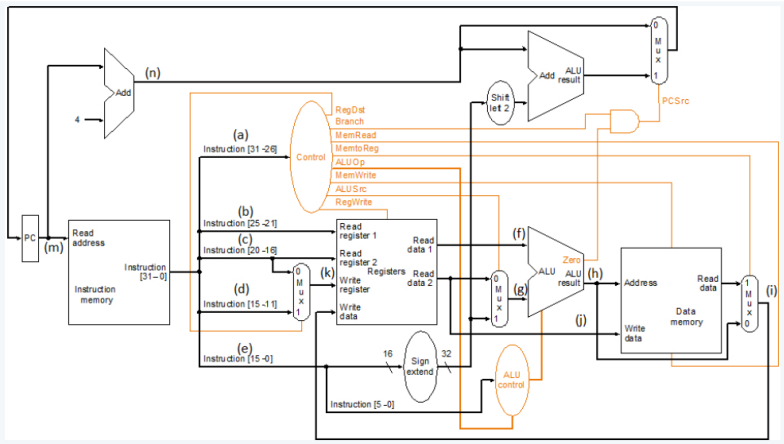
This is Program A on MARS simulator. Refer to this program to answer the following questions.

Question **1**

Partially correct

Mark 1.00 out of 10.00

Flag question



Program A runs on a single cycle processor with a clock rate of 4 GHz. What are the values for the following label in cycle 3?

b	0x00400010	✗
c	0x00400014	✗
d	0x00400008	✗
e	0x00400018	✗
f	1	✗
g	0	✓
h	x	✗
k	1	✗
m	0x15	✗
n	0x10	✗

Your answer is partially correct.

You have correctly selected 1.

The correct answer is: b → $0, c → $11, d → x, e → 0, f → 0, g → 0, h → 0, k → $11, m → 0x00400008, n → 0x0040000c

Quiz navigation

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Single Cycle Proc

1 2 3

Multi Cycle Proce

i 4 5

Pipelined Proces

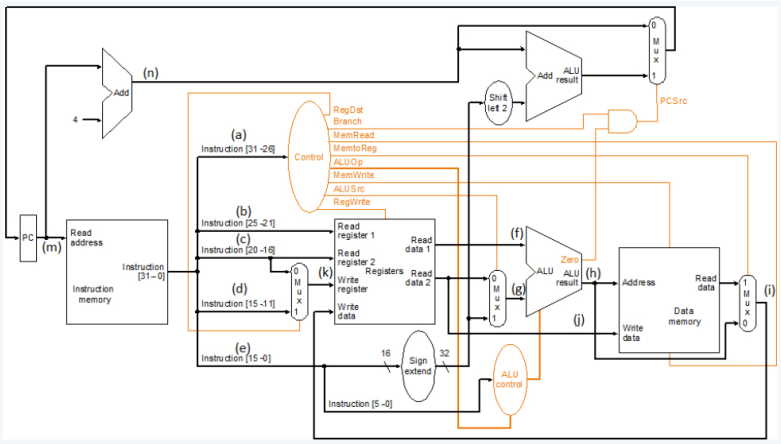
i 6 7 8

Question **2**

Partially correct

Mark 4.00 out of 7.00

Flag question



Program A runs on a single cycle processor with a clock rate of 4 GHz. What are the values for the following control signals in cycle 3?

RegWr	1	✔
MemtoReg	1	✖
RegDst	0	✔
ALUSrc	x	✖
MemRead	1	✖
Branch	0	✔
MemWr	0	✔

Your answer is partially correct.

You have correctly selected 4.

The correct answer is: RegWr → 1, MemtoReg → 0, RegDst → 0, ALUSrc → 1, MemRead → 0, Branch → 0, MemWr → 0

Question **3**

Incorrect

Mark 0.00 out of 2.00

Flag question

How long would it take for Program A to complete the execution, assuming it is running on a single cycle processor at 4 GHz clock rate? Write the answer using a standard prefix, e.g. 45 ps

Answer: 42/4x10^9 = 105 ns ✖

The correct answer is: 2.5 ns

Information

Flag question

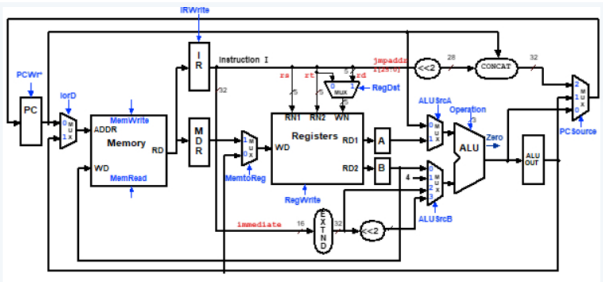
Step	Step name	Action for R-type instructions	Action for memory-reference instructions	Action for branches	Action for jumps
1: IF	Instruction fetch	IR = Memory[PC]			
		PC = PC + 4			
2: ID	Instruction decode/register fetch	A = Reg [IR[25-21]]			
		B = Reg [IR[20-16]]			
		ALUOut = PC + (sign-extend (IR[15-0]) << 2)			
3: EX	Execution, address computation, branch/ jump completion	ALUOut = A op B	ALUOut = A + sign-extend (IR[15-0])	if (A ==B) then PC = ALUOut	PC = PC [31-28] II (IR[25-0]<<2)
4: MEM	Memory access or R-type completion	Reg [IR[15-11]] = ALUOut	Load: MDR = Memory[ALUOut] or Store: Memory [ALUOut] = B		
5: WB	Memory read completion		Load: Reg[IR[20-16]] = MDR		

Question **4**

Partially correct

Mark 3.33 out of 5.00

Flag question



Program A runs on a multicycle processor with a clock rate of 4 GHz. What are the values for the following label in cycle 3?

PCWr	0	✔
IorD	1	✖
MemWrite	0	✔
MemRead	1	✖
IRWrite	0	✔
MemtoReg	x	✔
RegWr	0	✔
RegDst	x	✔
ALUSrcA	x	✖
ALUSrcB	x	✖
Operation	add	✔
PCSource	x	✔

Your answer is partially correct.

You have correctly selected 8.
The correct answer is: PCWr → 0,
IorD → x,
MemWrite → 0,
MemRead → 0,
IRWrite → 0,
MemtoReg → x,
RegWr → 0,
RegDst → x,
ALUSrcA → 1,
ALUSrcB → 0,
Operation → add,
PCSource → x

Question **5**

Incorrect

Mark 0.00 out of 2.00

Flag question

How long would it take for Program A to complete the execution, assuming it is running on a multicycle processor at 4 GHz clock rate? Write the answer using a standard prefix, e.g. 45 ps

Answer: 45/4x10^9 = 1125 ns ✖

The correct answer is: 9.5 ns

Information

Flag question

	EX				MEM			WB	
Instruction	Reg Dst	ALU Op1	ALU Op0	ALU Src	Branch	Mem Read	Mem Write	Reg write	Mem to Reg
R-format	1	1	0	0	0	0	0	1	0
lw	0	0	0	1	0	1	0	1	1
sw	X	0	0	1	0	0	1	0	X
beq	X	0	1	0	1	0	0	0	X
I-format	0	1	0	1	0	0	0	1	0

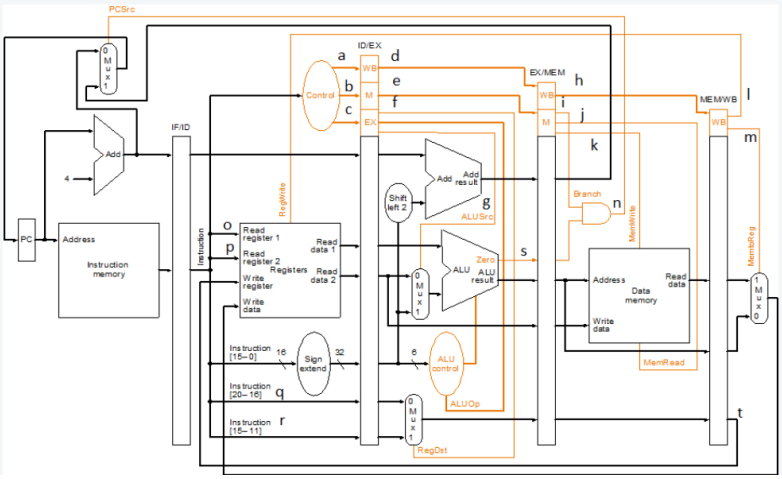
Referring to this table, answer the following questions.

Question **6**

Partially correct

Mark 1.85 out of 6.00

Flag question



Program A runs on a pipelined processor with a clock rate of 4 GHz. What are the values for the following label in cycle 3?

a 0101 ✗
b 1100 ✗
c 10 ✗
d 1 ✗
e 0 ✗
f 0 ✓
g 000 ✗
h x ✓
i x ✓
j 0 ✗
k 0 ✗
l 1 ✗
m x ✓

Your answer is partially correct.

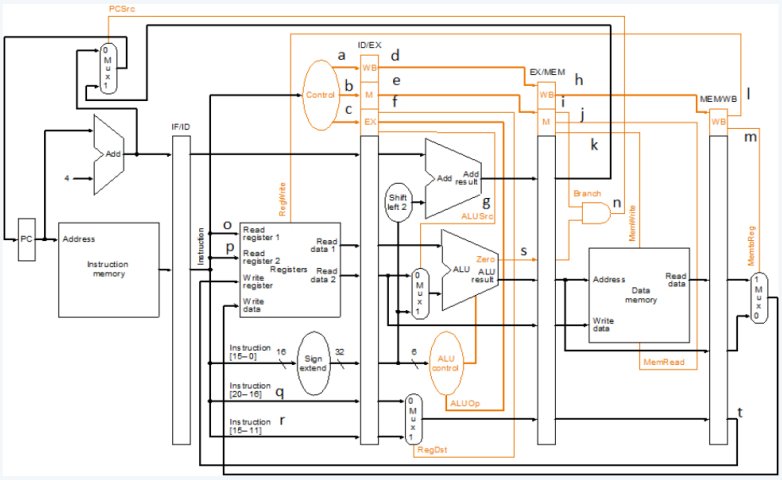
You have correctly selected 4.
The correct answer is: a → 10, b → 000, c → 0101, d → 10, e → 000, f → 0, g → 1, h → x, i → x, j → x, k → x, l → x, m → x

Question **7**

Incorrect

Mark 0.00 out of 5.00

Flag question



Program A runs on a pipelined processor with a clock rate of 4 GHz. What are the values for the following label in cycle 3?

o 0x15 ✗
p $12 ✗
q x ✗
r $0 ✗
t 0x11 ✗

Your answer is incorrect.

The correct answer is: o → $0, p → x, q → $10, r → x, t → x

Question **8**

Not answered

Marked out of 3.00

Flag question

How long would it take for Program A to complete the execution, assuming it is running on a pipelined processor at 4 GHz clock rate? Write the answer using a standard prefix, e.g. 45 ps

Answer: ✗

The correct answer is: 3.5 ns

Finish review