CS2100 Tutorial 5

AY 24/25 Sem 2 — github/omgeta

Q1. (a.) Solution:

	Registers File				**ALU**		**Data Memory**	
	RR1	RR2	WR	WD	Opr1	Opr2	Address	Write Data
(i)	$15	$24	$24	Mem([$15]+0)	[$15]	0	[$15]	[$24]
(ii)	$1	$3	$3	Mem([$1] - [$3])	[$1]	[$3]	[$1] - [$3]	[$3]
(iii)	$20	$5	$25	[$20]-[$5]	[$20]	[$5]	[$20]-[$5]	[$5]

	RegDst	**RegWr**	**ALUSrc**	**MRd**	**MWr**	**MToR**	**Brch**	**ALUOp**	**ALUctrl**
(i)	0	1	1	1	0	1	0	00	0010
(ii)	0	0	0	0	0	0	1	01	0110
(iii)	1	1	0	0	0	0	0	10	0110

(b.)

Q2. (a.) Critical path $= 400 + 200 + 30 + 120 + 30 + 200 = 980ps$

(b.) Critical path $= 400 + 200 + 120 + 350 + 30 + 200 = 1300ps$

(c.) Critical path $= 400 + 200 + 30 + 120 + 20 + 30 + 30 = 800ps$

Q3. (a.) Right result: add $t0, $t1, $t0
Wrong result: add $t1, $t1, $t0

(b.) Right result: lw $t0, 16384($t1) (first 5 bits of $16384 = 8 = \$t0$)
Wrong result: lw $t0, 0($t1)

(c.) Right result: beq $t0, $t1, 12 (any answer)
No answer.