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Homework 7

1a add, Mux x 4, ALU, Regs x 2, J-mem,

$$70 + (20 \times 4) + 90 + 180 + 200 =$$

$$70 + 80 + 90 + 180 + 200 =$$

$$150 + 240 + 200 = 620 \text{ ps}$$

530

b I-mem, add, ALU, D-mem, sign-extend, mux x 4, reg x 2

$$200 + 70 + 90 + 250 + 15 + (20 \times 4) + 90 =$$

$$270 + 90 + 265 + 80 + 180 =$$

~~885 ps~~ = 780

c Add, I-mem, reg, ALU, sign-extend, D-mem, Mux x 2 =

$$70 + 200 + 90 + 90 + 15 + 250 + (20 \times 2) =$$

$$270 + 180 + 265 + 40 =$$

~~755 ps~~ 650

d I-mem, Mux x 2, ALU, Sign-extend, Shift << 2, Add x 2, reg =

$$200 + (20 \times 2) + 90 + 15 + 10 + (10 \times 2) + 90 =$$

$$240 + 115 + 140 + 90 =$$

~~585 ps~~ = 420

e I-mem, Add, shift << 2, mux =

$$200 + 70 + 10 + 20 =$$

$$200 + 100 =$$

~~300 ps~~ = 230

(-10)

	I-Mem 200	Add 70	Mux 20	Alu 90	Regs 90	D-Mem 250	Sign-Ex 15	Sf-L-2 10	Total ps
add	1	-	3	1	2	-	-	-	530
lw	1	-	3	1	2	1	-	-	780
sw	1	-	1	1	1	1	-	-	650
beq	1	-	2	1	1	-	-	-	420
J	1	-	1	-	-	-	-	1	230

[illegible]

b 00010100

05010100 → 20

d 00010 \rightarrow c2 \rightarrow 3