

Problem 5

Given a processor with the operation ADD OP1, OP2 on two explicit operands, performing $OP1 \leftarrow OP1 + OP2$

The format of the instruction is 16 bits according to

Opcode	OP1	OP2
0110		
4 bits	6 bits	6 bits

Addressing mode of both operands is equal. Given the memory positions in the table, PC=0 and base register is 5. Consider the first instruction and give in the table where the result is written and which value is written in hexadecimal for the given addressing modes. For the notation, M(10) is memory position 10 and R10 is register 10.

	OP1	OP2
ADD		

Memory

Pos	Content
0	60c2 _{hex}
1	0010 _{hex}
2	0008 _{hex}
3	0001 _{hex}
4	001a _{hex}
5	F000 _{hex}
6	5555 _{hex}
7	bafe _{hex}
8	1000 _{hex}

Adressing	where	value _{hex}
Direct to mem	0	60c2
Indirect via mem	24770	-
Relative to PC (PC increases on fetching)	0	60c2
Relative to base	5	F000

Problem 6

Given the instruction formats in the table and the initial state of the memory. Derive the new state of the memory following the program instructions.

format	Address op1	op2	op3
SUM1 op1,#op2,dest	Direct mem	immediate	Direct mem
SUM2 #op1,#op2,(dest)	immediate	immediate	indirect
SUM3 #op1,(op2),dest	immediate	indirect	Direct mem

Program

	mem	
	pos	:
	20	40
SUM1 20, #30, 40		:
SUM2 #20, #0, (60)	40	60
		:
SUM1 40, # -50, 100		:
	60	100
SUM3 #100, (100), 100		:
		:
		:
The new state of memory is 160	100	-4
		: