

Hex Address	Instruction	Binary Contents of Memory Address	Hex Contents of Memory
100	Load 104	0001 0001 0000 0100	1104
101	Add 105	0011 0001 0000 0101	3105
102	Store 106	0010 0001 0000 0110	2106
103	Halt	0111 0000 0000 0000	7000
104	0023	0000 0000 0010 0011	0023
105	FFE9	1111 1111 1110 1001	FFE9
106	0000	0000 0000 0000 0000	0000

Table 4.3 A Program to Add Two Numbers

a) Load 104

Step	RTN	PC	IR	MAR	MBR	AC
(initial values)		100	----	----	----	----
Fetch	MAR ← PC	100	----	100	----	----
	IR ← M[MAR]	100	1104	100	----	----
	PC ← PC + 1	101	1104	100	----	----
Decode	MAR ← IR[11-0]	101	1104	104	----	----
	(Decode IR[15-12])	101	1104	104	----	----
Get operand	MBR ← M[MAR]	101	1104	104	0023	----
Execute	AC ← MBR	101	1104	104	0023	0023

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b) Add 105

Step	RTN	PC	IR	MAR	MBR	AC
(initial values)		101	1104	104	0023	0023
Fetch	MAR ← PC	101	1104	101	0023	0023
	IR ← M[MAR]	101	3105	101	0023	0023
	PC ← PC + 1	102	3105	101	0023	0023
Decode	MAR ← IR[11-0]	102	3105	105	0023	0023
	(Decode IR[15-12])	102	3105	105	0023	0023
Get operand	MBR ← M[MAR]	102	3105	105	FFE9	0023
Execute	AC ← AC + MBR	102	3105	105	FFE9	000C

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c) Store 106

Step	RTN	PC	IR	MAR	MBR	AC
(initial values)		102	3105	105	FFE9	000C
Fetch	MAR ← PC	102	3105	102	FFE9	000C
	IR ← M[MAR]	102	3105	102	FFE9	000C
	PC ← PC + 1	103	2106	102	FFE9	000C
Decode	MAR ← IR[11-0]	103	2106	106	FFE9	000C
	(Decode IR[15-12])	103	2106	106	FFE9	000C
Get operand	(not necessary)	103	2106	106	000C	000C
Execute	MBR ← AC	103	2106	106	000C	000C
	M[MAR] ← MBR	103	2106	106	000C	000C

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