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Homework 3
Collaborated with Sergio Zavala

1.
M[Sp] ← Register Value
SP ← SP – 1

a.
Register Value is store at memory and we know memory takes in 2 cycles. Each PUSH takes 2 cycle and there is total PUSH of 3. Register $Value_1$, Register $Value_2$, and Register $Value_{result}$. Storing only takes 1 cycle and it waits for a cycle.

2(3) + 1 + 1 = 8 cycles

b.
SP = 7Dh = 125d = 8'b01111101
Since PUSHA instruction updates the register and is decremented by 1 (SP – 1), the value now will be – in decimal – 125 - 1 = 124d → 7C
The new value = 7C

2.

	7	6	5	4	3	2	1	0	Comments *OpCode*
3C	0	0	0	0	0	0	0	0	LODA *0000*
3D	0	0	0	0	0	1	0	1	5H *Content = 0101*
3F	0	0	0	0	0	0	1	0	ADDA *02 = 0010*
40	0	0	0	0	1	0	1	0	10 *Content = 1010*
41	0	0	0	0	0	0	1	1	ADDO *03 = 0011*
42	0	0	0	0	0	1	1	0	JMPP *06 = 0110*
43	0	0	0	1	1	1	0	0	1C *Content 0001 1100*
44	0	0	0	0	0	0	0	1	STOA *01= 0001*
45	1	1	1	1	0	0	1	0	F2 *1111 0010*