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ECE 242 – Programming Assignment #2 **Spring 2021**

Due Date: Tuesday, March 2nd 2021, 11:59PM

PART I:

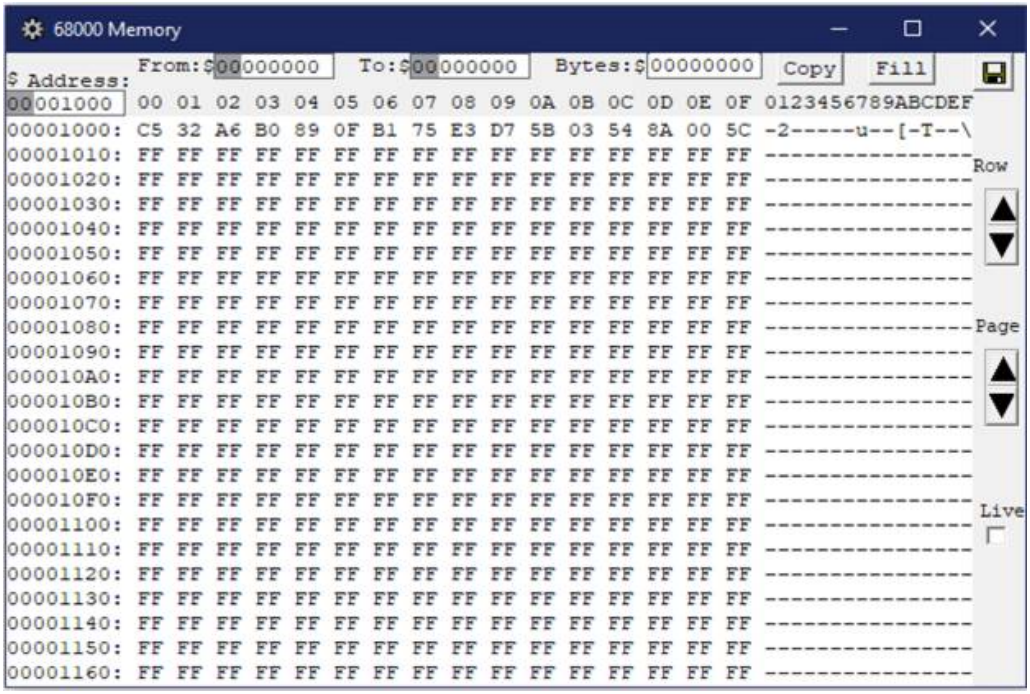
1. Write the following values in the memory locations below as the microprocessor would store them starting at address $1000.

$C532_{16}$
$A6B0_{16}$
89_{16}
F_{16}
$B175E3D7_{16}$
$5B03548A_{16}$
$005C_{16}$

Memory Contents

Address	Bits 15-8	Bits 7-0
$1000	C5	32
$1002	A6	B0
$1004	89	00
$1006	0F	00
$1008	B1	75
$100A	E3	D7
$100C	5B	03
$100E	54	8A
$1010	00	5C

6.



7. Memory Contents

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$1002	A6	B0
$1004	89	00
$1006	0F	00
$1008	B1	75
$100A	E3	D7
$100C	5B	03
$100E	54	8A
$1010	00	5C

Part II:

5. Examine the top part of your screen. Record in the box below, the names and contents of any registers that contain non-zero values. (Most registers will contain zeroes).

$D5 = 39_{16}$

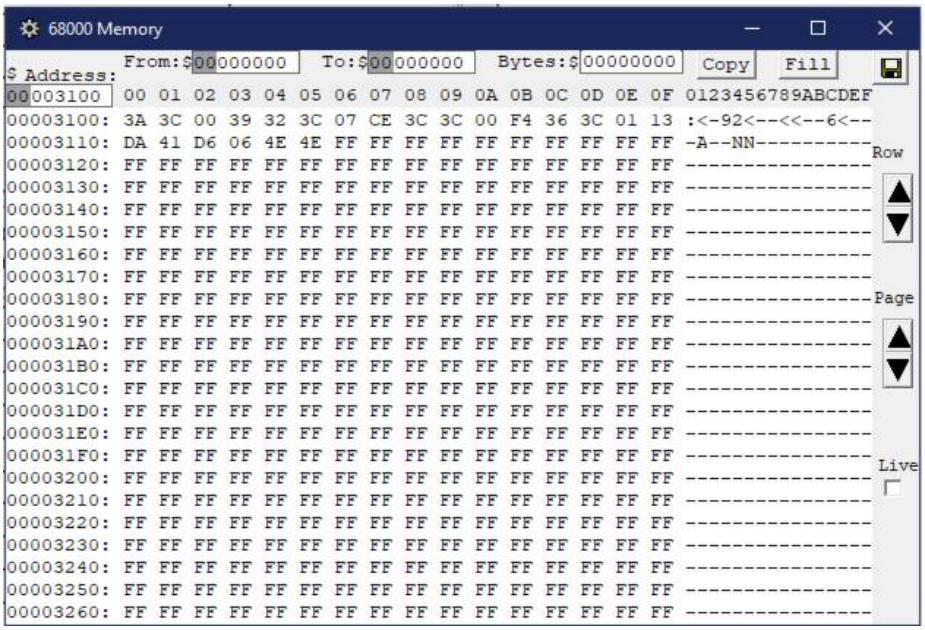
6. Examine the bottom part of your screen. Record the output by filling in the table below.

PC	Op-code	Instruction
PC=00003100	3A3C	MOVEW

7. To execute each instruction, press the Step-Over button or press F9. After each instruction is executed, record the updated values of only the data registers referenced above and the number of cycles. Repeat until all seven instructions are executed. All Data Register values in Hexadecimal

Instruction	Data Registers	Number of Cycles
MOVEW	D5=39	8
MOVEW	D1=7CE	16
MOVEW	D6=F4	24
MOVEW	D3=113	32
ADD	D5=807	36
ADD	D3=107, D5=807	40
TRAP		40

8.



9.

Hex Code	Op-Code					Data			
	Size	Destination		Source					
		Register	Mode	Mode	Register				
3A3C0039	0011	101	000	111	100	0000	0000	0011	1001
323C07CE	0011	001	000	111	100	0000	0111	1100	1110
3C3C00F4	0011	110	000	111	100	0000	0000	1111	0100
363C0113	0011	011	000	111	100	0000	0001	0001	0011
		Register	Op-Code	Effective Address					
				Mode	Register				
DA41	1101	101	001	000	001				
D606	1101	011	000	000	110				
4E4E	0100 1110 0100 1110								

10. $3A3C0039_{16}$ = MOVE.W #$39, D5

$323C07CE_{16}$ = MOVE.W #$7CE, D1

$3C3C00F4_{16}$ = MOVE.W #$F4, D6

$363C0113_{16}$ = MOVE.W #$113, D3

$DA41_{16}$ = ADD.W D1, D5

$D606_{16}$ = ADD.B D6, D3

$4E4E_{16}$ = TRAP #14