

## **Lab Assignment 3**

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A.) Multiplication of Two 8-Bit Numbers by Bit Rotation Method

### **Implementation:**

*;code*

*start: nop*

*LHLD 1000H*

*XCHG*

*LDA 1002H*

*LXI H,0000H*

*MVI C,08H*

*up: DAD H*

*RAL*

*jnc down*

*DAD D*

*down: DCR C*

*JNZ up*

*SHLD 1003H*

*Hlt*

## Input:

1000H->12

1002h->17

## Output:

1003H-> 204

The screenshot displays a 68000 simulator interface. The main window is divided into several panels. The 'Memory' panel on the left shows a table of memory addresses and their corresponding data values. The 'Registers' panel on the right shows the current values of the 68000 registers. The 'I/O Ports' panel at the bottom right shows the current port value. The 'Assembler Message' panel at the bottom left shows the output of the assembler.

**Memory Table:**

Address (Hex)	Address	Data
2000	8192	12
2001	8193	0
2002	8194	17
2003	8195	204
2004	8196	0
2005	8197	0
2006	8198	0
2007	8199	0
2008	8200	0
2009	8201	0
200A	8202	0
200B	8203	0
200C	8204	0
200D	8205	0
200E	8206	0

**Registers:**

Register	Value
A	00
BC	00 00
DE	00 0C
HL	00 CC
PSW	00 00
PC	42 1B
SP	FF FF
Int-Reg	00

**Flags:**

Flag	Value
S	0
Z	1
AC	0
P	1
C	0

**Decimal - Hex Conversion:**

Decimal: 0 Hex: 0

**I/O Ports:**

0 - + 00

**Memory:**

0 - + 00

**Assembler Message:**

Line No Assembler Message

0 Program assembled successfully

Simulator: Idle

## B.) Division of Two 8-Bit Numbers by Repeated Subtraction Method.

### **Implementation:**

jmp start

;data

;code

start: nop

LDA 2000H;divisor

MOV B,A

LDA 2001H;dividend

MVI C,00H

CMP B

JC down

up: SUB B

INR C

CMP B

JNC up

down: STA 2002H ;remainder

MOV A,C

STA 2003H;quotient

hlt

## Input:

2000H->11

2001H->61

## Output:

2002H->6(remainder)

2003H->5(quotient)

The screenshot displays an assembly simulator interface with the following components:

- Memory Window:** Shows a memory dump starting at address 2000h. The data is as follows:

Address (Hex)	Address	Data
2000	8192	11
2001	8193	61
2002	8194	6
2003	8195	5
2004	8196	0
2005	8197	0
2006	8198	0
2007	8199	0
2008	8200	0
2009	8201	0
200A	8202	0
200B	8203	0
200C	8204	0
200D	8205	0
200E	8206	0

- Registers and Flags:** A table showing the state of various registers and flags.

Register	Value	Flag	Value
A	05	S	1
BC	0B 05	Z	0
DE	00 00	AC	0
HL	00 00	P	0
PSW	00 00	C	1
PC	42 1F		
SP	FF FF		
Int-Reg	00		

- Decimal - Hex Conversion:** A section for converting between decimal and hex values. Both fields show '0'.
- I/O Ports:** A section for I/O operations. The value field shows '0'.
- Memory:** A section for memory operations. The value field shows '0'.
- Assembler Message:** A log showing the message "Program assembled successfully" at line 0.