Microprocessor Assignment

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Table of Contents

1 Write a program to perform the addition, subtraction, multiplication and division of two 8-bit numbers using Microprocessor 8085 instructions.

```
1
2  ;Addition
3  LDA 2001
4  MOV B, A
5  LDA 2002
6  ADD B
7  STA 2004
8
9
10 ;Subtration
11 MVI A,00H
12 MVI B,00H
13 LDA 2002
14 MOV B, A
15 LDA 2001
16 SUB B
17 STA 2005
18
19
20 ;Multiplication
21 MVI A,00H
22 MVI B,00H
23 LXI H, 2001
24 MOV B,M
25 INX H
26 MOV C,M
27 LOOP: ADD B
28 DCR C
29 JNZ LOOP
30 STA 2006
31
32
33 ;Division
34 MVI A, 00H
35 MVI B, 00H
36 MVI C, 00H
37
38 LXI H, 2001
39 MOV B, M
```

```
MVI C, 00H
INX H
MOV A, M
LOOPk: CMP B
JC CARRY_SET
SUB B
INR C
JMP LOOPk
CARRY_SET: STA 2007
MOV A, C
STA 2008
HLT
```

Code 1: Code

2 Write a program to find the largest number in an array using Microprocessor 8085 instructions.

```

LXI H, 0000H
MVI B, 05H
MOVA, M
LOOP: DCR B
JZ EXIT
INX H
CMP M
JC STORE_BIG
JMP LOOP
STORE_BIG: MOV A, M
JMP LOOP
EXIT: STA 0007H
HLT
```

Code 2: Code

3 Write a program to find the smallest number in an array using Microprocessor 8085 instructions.

```

```

```
LXI H, 0000H
MVI B, 05H
MOV A, M
LOOP: DCR B
JZ EXIT
INX H
CMP M
JNC STORE_SMALL
JMP LOOP
STORE_SMALL: MOV A, M
JMP LOOP
EXIT: STA 0007H
HLT
```

Code 3: Code

4 Code to develop a subroutine to add two floating point number.

```
ADD_FLOATS:
LXI H, 0030
LXI D, 0032
MOV A, M
INX H
MOV B, M
INX D
SUB B
MOV B, A
MVI C, 0
LOOP_SHIFT:
RRC
RRC
DCR B
JNZ LOOP_SHIFT
MOV A, M
ADD C
MOV M, A
HLT
```

Code 4: Code

5 Program to add two double byte numbers.

```
LXI D, 2002H
MOV A, M
ADD E
STAX D
INX H
INX D
MOV A, M
ADC E
STAX D
HLT
```

Code 5: Code

6 Program to divide 4byte number with the another 4 byte number.

```
LXI H, 0050H
MOV A, M
INX H
MOV B, M
INX H
MOV C, M
INX H
MOV D, M
LXI H, 0060H
MOV E, M
INX H
MOV H, M
INX H
MOV L, M
INX H
MOV M, A
LXI D, 5000H
MVI A, 00H
MVI B, 00H
MVI C, 00H
MVI D, 00H
LOOP:
MOV A, M
MOV H, E
SUB H
MOV M, A
INX D
```

```
JNC NOBORROW
INR C
NOBORROW:
INX H
INX H
DCR L
JNZ LOOP
HLT
```

Code 6: Code

7 Program to divide 8 -bit number with 8-bit number upto to fractional coefficient of 16 bit

```
MVI B, 52H
MVI C, 17H
MVI A, 00H
MVI D, 00H
XRA A
DIV_LOOP:
RLC B
RLC D
MOV E, A
CMP C
JC NO_SUBTRACTION
SUB C
MOV A, E
INR D
NO_SUBTRACTION:
DCR C
JNZ DIV_LOOP
HLT
```

Code 7: Code

8 Program to Adding first N natural number and store result on memory location x.

```
MVI C,0AH
MVI A,00H
LOOP: MOV B,C
ADD B
```

```
DCR C
JNZ LOOP
STA 0050H
HLT
```

Code 8: Code

9 Program to Sort an array using bubble sort

```
; Initialize data
MVI A, 96H    ; Load the dividend into the accumulator
MVI B, 4H     ; Load the divisor into register B

; Initialize quotient and remainder to 0
MVI C, 00H    ; Quotient
MVI D, 00H    ; Remainder

; Loop for division
LOOP:
  CMP B       ; Compare A and B
  JC DONE     ; If A < B, we are done
  SUB B       ; Subtract B from A
  INR C       ; Increment quotient
  JMP LOOP    ; Repeat the loop

DONE:
; The result is in C (quotient) and D (remainder)

HLT          ; Halt the program
```

Code 9: Code

10 Program to find the factorial of a number

```
LXI H,0050H
MOV B,M
MVI D,01H
FACTORIAL: CALL MULTIPLY
DCR B
JNZ FACTORIAL
INX H
MOV M,D
HLT
```

```
MULTIPLY: MOV E,B
MVI A,00H
MULTIPLY_LOOP: ADD D
DCR E
JNZ MULTIPLY_LOOP
MOV D,A
RET
```

Code 10: Code

11 Program to find the 1's and 2's compliment of a giving number

```
LDA 0050H
MVI B,01H
CMA
STA 0051H
ADD B
STA 0052H
HLT
```

Code 11: Code

12 Program to find addition of 2 four BYTE number

```
LDA 0100H
LXI H,0200H
MOV B,M
ADC B
STA 0300H
INX H
LDA 0101H
MOV B,M
ADC B
STA 0301H
INX H
LDA 0102H
MOV B,M
ADC B
STA 0302H
INX H
```

```
17 LDA 0103H
18 MOV B,M
19 ADC B
20 STA 0303H
21 HLT
```

Code 12: Code