Ahsanullah University of Science & Technology

Department of Computer Science and Engineering

Course No : CSE 2214

Course Title : Assembly Language Programming Sessional

Assignment no : 04

Date of Performance : 26.02.20

Date of Submission : 03.03.20

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Year : 2nd

Semester : 2nd

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Question 1:

Write a program to input an uppercase letter and display its corresponding lowercase letter.

Answer:

```
.MODEL SMALL
.STACK 100H
.DATA
CR EQU 0DH
LF EQU 0AH
MSG1 DB 'ENTER A UPPERCASE LETTER:$'
MSG2 DB 0DH,0AH,'IN LOWERCASE IT IS:'
CHAR DB ?,'$'

.CODE
MAIN PROC
    ;initialize DS
    MOV AX,@DATA
    MOV DS,AX

   ;print user prompt
   LEA DX,MSG1
    MOV AH,9
    INT 21H
```

```
;input a uppercase character and convert to lowerCase
MOV AH,1
INT 21H
ADD AL,20H
MOV CHAR,AL

;display on the next line
LEA DX,MSG2
MOV AH,9
INT 21H

;DOS exit
MOV AH,4CH
INT 21H
END MAIN
```

Question 2:

Write a program to read two decimal digits whose sum is less than 10 and display them and their sum in the next line with appropriate message.

Answer:

```
.MODEL SMALL
.STACK 100H
.DATA
MSSG1 DB 'ENTER FIRST NUMBER : $'
MSSG2 DB 0DH,0AH,'ENTER SECOND NUMBER : $'
MSSG3 DB 0DH,0AH,'FINAL OUTPUT : $'
.CODE

MAIN PROC

    MOV AX,@DATA
    MOV DS,AX

    LEA DX,MSSG1
    MOV AH,9     ;PRINT FIRST MESSSAGE
     INT 21H

    MOV AH,1
    INT 21H      ;FIRST INPUT
    MOV BL,AL
```

```
MOV AH,2
MOV DL,0DH
INT 21H      ;FOR NEW LINE
MOV DL,0AH
INT 21H

LEA DX,MSSG2
MOV AH,9     ;PRINT SECOND MESSSAGE
INT 21H

MOV AH,1
INT 21H      ;SECOND INPUT
MOV BH,AL

MOV AH,2
MOV DL,0DH
INT 21H      ;FOR NEW LINE
MOV DL,0AH
INT 21H

LEA DX,MSSG3
MOV AH,9     ;PRINT MESSSAGE 3
INT 21H
```

```
MOV AH,2
ADD BL,BH
SUB BL,48     ;SUM OF TWO NUMBERS
MOV DL,BL
INT 21H

MOV AH,4CH
INT 21H

END MAIN
```

Question 3:

Using only MOV, ADD, SUB, INC, DEC and NEG, translate the following high level language assignment statements into assembly language. A, B, and C are word variables.

a. A = B – A

b. A = - (A + 1)

c. C = A + B

d. B = 3 × B + 7

e. A = B – A – 1

Answer: a. A = B-A

MOV AX,B

SUB AX,A

MOV A,AX

b. A = -(A+1)

MOV AX,A

INC AX

NEX AX

MOV A,AX

c. C = A+B

MOV AX,A

ADD AX,B

MOV C,AX

d. B = 3×B+7

MOV AX,B

ADD AX,B

ADD AX,B

ADD AX,7

MOV B,AX

e. A = B-A-1

```
MOV AX,B
SUB AX,A
DEC AX
MOV A,AX
```