AHSANULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

Department of Computer Science and Engineering

Course No : CSE 2214

Course Title : Assembly Language Programming Sessional

Assignment no : 10

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Submitted To : Ms.Tahsin Aziz & Md.Siam Ansary

Submitted By:

Group : A1

Name : Nusrat Jahan

Id : 18.01.04.020

Section : A

Question no: 01

Question: Suppose the class records are stored as follows

CLASS

DB 'MARY ALLEN ',67,45,98,33

DB 'SCOTT BAYLIS',70,56,87,44

DB 'GEORGE FRANK',82,72,89,40

DB 'SAM WONG ',78,76,92,60

Each name occupies 12 bytes. Write a program to print the name of each student and his or her average (truncated to an integer) for the four exams.

Solution:

```
.STACK 100H
.DATA
   PROMPT_1  DB  'The Class Marks are as follows : ',0DH,0AH,'$'
   PROMPT_2  DB  0DH,0AH,'The Average Marks of Students are as follows : ',0DH,0AH,'$'
      AVERAGE DW  4 DUP(0)
        CLASS    DB  'MARY ALLEN  ',67,45,98,33
                 DB  'SCOTT BAYLIS',70,56,87,44
                 DB  'GEORGE FRANK',82,72,89,40
                 DB  'SAM WONG    ',78,76,92,60
```

```
.CODE
        MAIN PROC
        MOV AX, @DATA
        MOV DS, AX
        LEA DX, PROMPT_1
        MOV AH, 9
        INT 21H
        LEA SI, CLASS
        MOV BH, 4
        MOV BL, 16
CALL PRINT_2D_ARRAY
        LEA DI, AVERAGE
        LEA SI, CLASS
        ADD SI, 12
        MOV CX, 4
@COMPUTE_AVERAGE:
        XOR AX, AX
        MOV DX, 4
  @SUM:
        XOR BH, BH
        MOV BL, [SI]
        ADD AX, BX
        INC SI
        DEC DX
   JNZ @SUM
        MOV BX, 4
        DIV BX
        MOV [DI], AX
        ADD DI, 2
```

```
        ADD SI, 12
LOOP @COMPUTE_AVERAGE
        LEA DX, PROMPT_2
        MOV AH, 9
        INT 21H
        LEA SI, AVERAGE
        LEA DI, CLASS
        MOV CX, 4
@PRINT_RESULT:
        MOV BX, 12
        MOV AH, 2
  @NAME:
        MOV DL, [DI]
        INT 21H
        INC DI
        DEC BX
JNZ @NAME
        MOV DL, 20H
        INT 21H
        MOV DL, ":"
        INT 21H
        MOV DL, 20H
        INT 21H
        XOR AH, AH
        MOV AL, [SI]
CALL OUTDEC
        MOV AH, 2
        MOV DL, 0DH
        INT 21H
```

```
        MOV DL, 0AH
        INT 21H
        ADD SI, 2
        ADD DI, 4
    LOOP @PRINT_RESULT
        MOV AH, 4CH
        INT 21H
        MAIN ENDP
       INCLUDE D:\ASSEMBLY\TEST_10A\OUTDEC_10(a).ASM
     INCLUDE D:\ASSEMBLY\TEST_10A\PRINT_10(a).ASM
END MAIN


PRINT_2D_ARRAY PROC
        PUSH AX
        PUSH CX
        PUSH DX
        PUSH SI
        MOV CX, BX
    @OUTER_LOOP:
        MOV CL, BL
        MOV AH, 2
    @PRINT_NAME:
        MOV DL, [SI]
        INT 21H
        INC SI
        DEC CL
        CMP CL, 4
```

```
JG @PRINT_NAME
        MOV DL, 20H
        INT 21H
  @INNER_LOOP:
        MOV AH, 2
        MOV DL, 20H
        INT 21H
        XOR AH, AH
        MOV AL, [SI]
   CALL OUTDEC
        INC SI
        DEC CL
  JNZ @INNER_LOOP
        MOV AH, 2
        MOV DL, 0DH
        INT 21H
        MOV DL, 0AH
        INT 21H
        DEC CH
 JNZ @OUTER_LOOP
         POP SI
         POP DX
         POP CX
         POP AX
         RET
PRINT_2D_ARRAY ENDP
```

```
OUTDEC PROC
        PUSH BX
        PUSH CX
        PUSH DX
        XOR CX, CX
        MOV BX, 10
  @OUTPUT:
        XOR DX, DX
        DIV BX
        PUSH DX
        INC CX
        OR AX, AX
    JNE @OUTPUT
        MOV AH, 2
     @DISPLAY:
        POP DX
        OR DL, 30H
        INT 21H
   LOOP @DISPLAY
        POP DX
        POP CX
        POP BX
        RET
OUTDEC ENDP
```

Question no: 02

Question: Write a program that uses XLAT to

(a) read a line of text, and

(b) print it on the next line with all small letters converted to capitals.

The input line may contain any characters - small letters, capital letters, digit,characters, punctuation and so on.

Solution:

```
.MODEL SMALL
.STACK 100H
.DATA

MSG DB 'ENTER TEXT: $'
MSG2 DB 'IN UPPERCASE: $'
TEXT DB 100 DUP ('$')

TABLE DB 97 DUP (' '), 'ABCDEFGHIJKLMNOPQRSTUVWXYZ'

.CODE
    MAIN PROC
            MOV AX, @DATA
            MOV DS, AX
            MOV AH, 9
            LEA DX, MSG
```

```
      INT 21H
      LEA SI, TEXT

INPUT:
   MOV AH, 1
   INT 21H

   CMP AL, 13D
   JE END_INPUT

   CMP AL, 'a'
   JL BOTTOM
   CMP AL, 'z'
   JG BOTTOM

   LEA BX, TABLE
   XLAT

   BOTTOM:
      MOV [SI], AL
      INC SI

   JMP INPUT
END_INPUT:

CALL NEWL

MOV AH, 9
LEA DX, MSG2
```

```
    INT 21H
    LEA DX, TEXT
    INT 21H

    MOV AH, 4CH
    INT 21H
  MAIN ENDP

  PROC NEWL
    MOV AH, 2
    MOV DL, 10D
    INT 21H
    MOV DL, 13D
    INT 21H
    RET
  NEWL ENDP
END MAIN
```