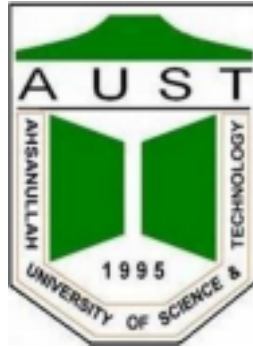


AHSANULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY



Department of Computer Science and Engineering Program: BSc in Computer Science and Engineering

Course Code: CSE 2214

Assignment No: 02

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Submitted by,

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Lab Section: B-1

Question 01: Write a program that will prompt the user to enter a hex digit character(0-F), display it on the next line in decimal and ask the user if he or she wants to do it again. If the user types “Y”, the program repeats. If the user types “N” the program terminates. If the user enters an illegal character, prompt the user to try again.

Solution:

```
.MODEL SMALL
.STACK 100H

.DATA
A DB "ENTER A HEX DIGIT (0-F): $"
B DB "THE DECIMAL OF YOUR HEX DIGIT IS: $"
C DB "DO YOU WANT TO DO IT AGAIN? (Y/N): $"
D DB "TRY AGAIN! $"

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

START:
    CALL NEWLINE
    MOV AH, 9
    LEA DX, A
    INT 21H

    ; Input char
    MOV AH, 1
    INT 21H

    ; Convert to uppercase if lowercase
    CMP AL, 'a'
    JB CHECK_DIGIT
    CMP AL, 'f'
    JA INVALID
    SUB AL, 32 ; convert 'a'-'f' to 'A'-'F'
```

```
CHECK_DIGIT:
    CMP AL, '0'
    JB INVALID
    CMP AL, '9'
    JBE IS_NUM
    CMP AL, 'A'
    JB INVALID
    CMP AL, 'F'
    JBE IS_ALPHA
    JMP INVALID
```

```
IS_NUM:
    SUB AL, '0'
    JMP PRINT
```

```
IS_ALPHA:
    SUB AL, 'A'
    ADD AL, 10
```

```
PRINT:
    MOV BL, AL
    CALL NEWLINE
    MOV AH, 9
    LEA DX, B
    INT 21H

    ; Display decimal
    CMP BL, 9
    JBE SINGLE
    MOV DL, '1'
    MOV AH, 2
    INT 21H
    MOV AL, BL
    SUB AL, 10
    ADD AL, '0'
    JMP OUT
```

```
SINGLE:
    MOV AL, BL
    ADD AL, '0'
```

OUT:

```
MOV DL, AL
MOV AH, 2
INT 21H
JMP ASK
```

INVALID:

```
CALL NEWLINE
MOV AH, 9
LEA DX, D
INT 21H
```

ASK:

```
CALL NEWLINE
MOV AH, 9
LEA DX, C
INT 21H
MOV AH, 1
INT 21H
CMP AL, 'Y'
JE START
CMP AL, 'y'
JE START
```

```
; Exit
MOV AX, 4C00H
INT 21H
```

MAIN ENDP

; Subroutine for newline

```
NEWLINE PROC
MOV AH, 2
MOV DL, 13
INT 21H
MOV DL, 10
INT 21H
RET
NEWLINE ENDP
```

END MAIN

Question 02: Write a program to read two capital letters and display them on the next line in alphabetical order.

Solution:

```
.MODEL SMALL
.STACK 100H
.DATA
MSG1 DB 'ENTER 1ST ALPHABET: $'
MSG2 DB 'ENTER 2ND ALPHABET: $'
MSG3 DB 'FIRST : $'
MSG4 DB 'SECOND: $'
A DB ?
B DB ?
.CODE
MAIN PROC
    MOV AX, @DATA
    MOV DS, AX

    ; Input A
    MOV AH, 9
    LEA DX, MSG1
    INT 21H
    MOV AH, 1
    INT 21H
    MOV A, AL

    ; Newline
    MOV AH, 2
    MOV DL, 13
    INT 21H
    MOV DL, 10
    INT 21H
```

```
; Input B
MOV AH, 9
LEA DX, MSG2
INT 21H
MOV AH, 1
INT 21H
MOV B, AL
```

```
; Newline
MOV AH, 2
MOV DL, 13
INT 21H
MOV DL, 10
INT 21H
```

```
; Compare and display in order
MOV AL, A
CMP AL, B
JG SWAP
```

```
; A is smaller
LEA DX, MSG3
MOV AH, 9
INT 21H
MOV DL, A
MOV AH, 2
INT 21H
```

```
MOV DL, 13
INT 21H
MOV DL, 10
INT 21H
```

```
LEA DX, MSG4
MOV AH, 9
INT 21H
MOV DL, B
MOV AH, 2
INT 21H
JMP ENDPRG
```

SWAP:

; B is smaller

LEA DX, MSG3

MOV AH, 9

INT 21H

MOV DL, B

MOV AH, 2

INT 21H

MOV DL, 13

INT 21H

MOV DL, 10

INT 21H

LEA DX, MSG4

MOV AH, 9

INT 21H

MOV DL, A

MOV AH, 2

INT 21H

ENDPRG:

MOV AH, 4CH

INT 21H

MAIN ENDP

END MAIN