Lab Report

Lab – 04

Course No: 3110

Course Name: Sessional Based on 3109 (Microprocessors and Assembly Language)

Submitted To:

Sadia Zaman Mishu

Assistant Professor,

Department of CSE, RUET

Submitted By:

Anika Tabassum Era

Roll: 1703176

Section: C

Experiment No: 04

Experiment Name: Write an assembly language program that will prompt the user to enter a HEX digit character (0-9 or A-F) and display it on next line in decimal and check whether this decimal number is odd or not. If odd then the program will repeat and if even then the program will terminate. If the user enters an illegal character, prompt the user to enter another character.

Code:

```
.MODEL SMALL

.STACK 100H

.DATA

MSG1 DB 0AH,0DH, 'Enter a hex digit: $'

MSG2 DB 0AH,0DH, 'In decimal it is: $'

MSG3 DB ' is an odd number $'

MSG4 DB ' is an even number $'

MSG5 DB ' is an illegal character $'


.CODE

MAIN PROC

      AGAIN:

   ;INITIALIZING PROMPT USER
```

```
MOV AX, @DATA

MOV DS, AX

; FIRST PROMPT USER MSG

LEA DX, MSG1

MOV AH,9

INT 21H

;INPUT HEX DIGIT

MOV AH, 1

INT 21H

MOV BL,AL

CMP BL, 57D  ; COMPARING BL WITH ASCII OF 9

JLE DIG      ; LESS OR EQUAL

JG  IS       ; GREATER

;INVALID CHECK

 ;IS HEX?

 IS:

CMP BL, 70D ; CHECK IF INPUT > F

 JG INV

 JLE HEX

INV:

;LINE FEED

 MOV DL,0AH

 MOV AH,2
```

```
 INT 21H
;CARRIAGE RETURN
 MOV DL,0DH
 MOV AH,2
 INT 21H
;PRINT
MOV DL, 0AH
 INT 21H
 MOV DL ,0DH
 INT 21H
 MOV DL, BL
 MOV AH,2
 INT 21H
 MOV AX, @DATA
 MOV DS, AX
 MOV AH, 9
 LEA DX, MSG5
 INT 21H
 MOV AH, 2
 MOV DL, 0AH
 INT 21H
 MOV DL ,0DH
 INT 21H
```

```
JMP AGAIN
 HEX:
 SUB BL,17D ;CONVERTING THE HEX CHARACTER IN DECIMAL
 ;LINE FEED
  MOV DL,0AH
   MOV AH,2
   INT 21H
   ;CARRIAGE RETURN
    MOV DL,0DH
    MOV AH,2
    INT 21H
    ;SECOND PROMPT USER MSG2
     LEA DX, MSG2
    MOV AH,9
    INT 21H
    MOV DL,49D ;PRINTING "1" BEFORE BL
    MOV AH,2
    INT 21H
    ; PRINT THE CONVERTED VALUE THAT IS STORED IN BL
    MOV DL,BL
    MOV AH,2
    INT 21H
    ;LINE FEED
```

```
MOV DL,0AH
 MOV AH,2
 INT 21H
 ;CARRIAGE RETURN
MOV DL,0DH
 MOV AH,2
 INT 21H
 MOV DL, 0AH
 INT 21H
 MOV DL ,0DH
 INT 21H
 MOV DL,49D ;PRINTING "1" BEFORE BL
 MOV AH,2
 INT 21H
 MOV DL, BL
 MOV AH,2
 INT 21H
 ;EVEN ODD
 TEST BL, 1   ;A CHECK TO EVEN ODD
 JNE ODDD
 MOV AX, @DATA
 MOV DS, AX
 MOV AH, 9
```

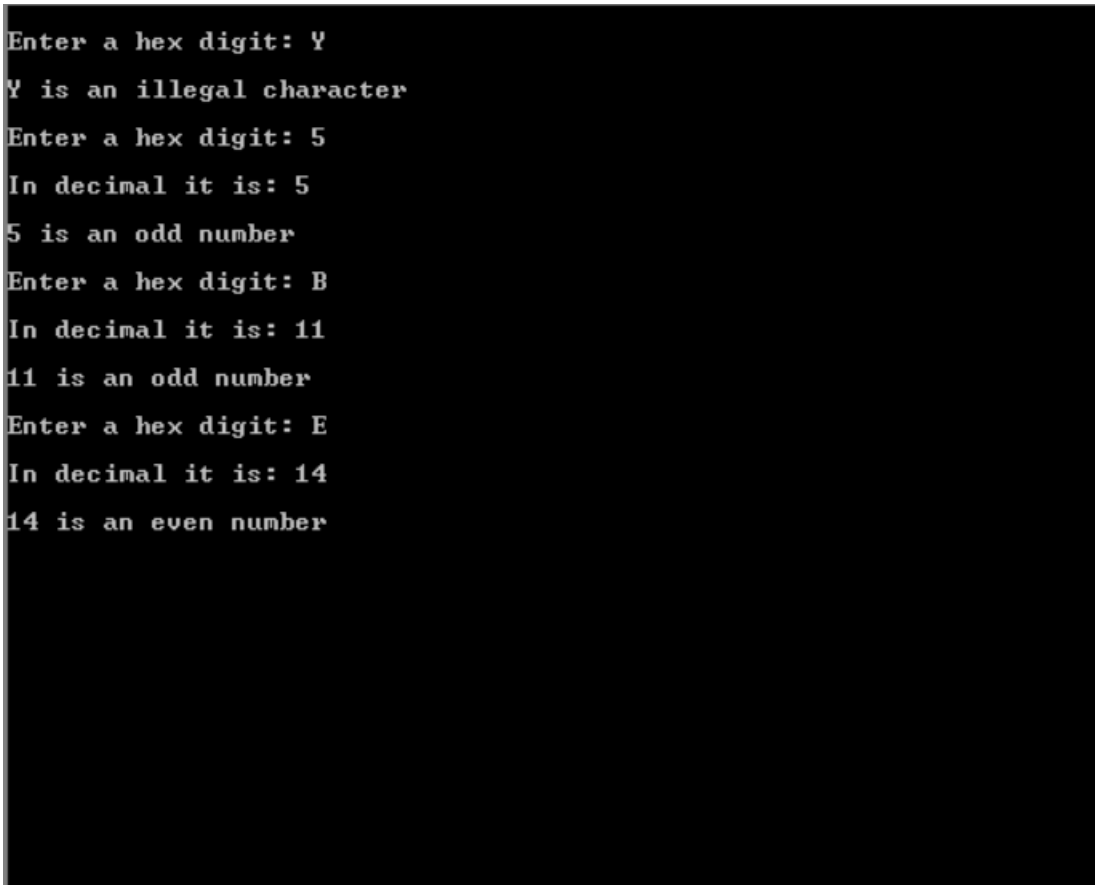
```
LEA DX, MSG4
    INT 21H
    JMP EXIT
    ODDD:
    MOV AX, @DATA
    MOV DS, AX
    MOV AH, 9
    LEA DX, MSG3
    INT 21H
    MOV AH, 2
    MOV DL, 0DH
    INT 21H
    MOV DL, 0AH
    INT 21H
    JMP AGAIN
    DIG:
    SUB BL, 0D
    ;LINE FEED
    MOV DL,0AH
    MOV AH,2
    INT 21H
   ;CARRIAGE RETURN
```

```
MOV DL,0DH
MOV AH,2
INT 21H
;SECOND PROMPT USER MSG2
LEA DX, MSG2
MOV AH,9
INT 21H
;PRINTS THE CONVERTED NUMBER
MOV AH, 2
MOV DL, BL
INT 21H
;LINE FEED
MOV DL,0AH
MOV AH,2
INT 21H
;CARRIAGE RETURN
MOV DL,0DH
MOV AH,2
INT 21H
MOV DL, 0AH
INT 21H
MOV DL ,0DH
INT 21H
```

```
MOV DL, BL
  MOV AH,2
  INT 21H
 ;EVEN ODD
 TEST BL, 1   ;A CHECK TO EVEN ODD
  JNE ODD
  MOV AX, @DATA
  MOV DS, AX
  MOV AH, 9
  LEA DX, MSG4
  INT 21H
  JMP EXIT
  ODD:
 MOV AX, @DATA
  MOV DS, AX
  MOV AH, 9
  LEA DX, MSG3
  INT 21H
  MOV AH, 2
  MOV DL, 0DH
  INT 21H
  MOV DL, 0AH
  INT 21H
```

```
    JMP AGAIN

    EXIT:

    ;DOS RETURN

    MOV AH, 4CH

    INT 21H

    MAIN ENDP

END MAIN
```

Output:



Discussions:

The solution to the given problem statement was comprehensible yet, there was some difficulties while coding. It was at first tough to making the loop process functional, later on the hexadecimal-decimal conversion seemed puzzling.

Overall the functions are running without error.