Experiment Name :

Find the maximum length of longest consecutive sequence and the longest consecutive sequence in a string.

Theory :

The objective of this program is to find the maximum length of the letter which is ordered increasingly and no letter is missing between the letters. For example, if a given string is “aertdefgabghj” then the maximum length will be – 4 (defg) as they are the longest consecutive substring of that main string.

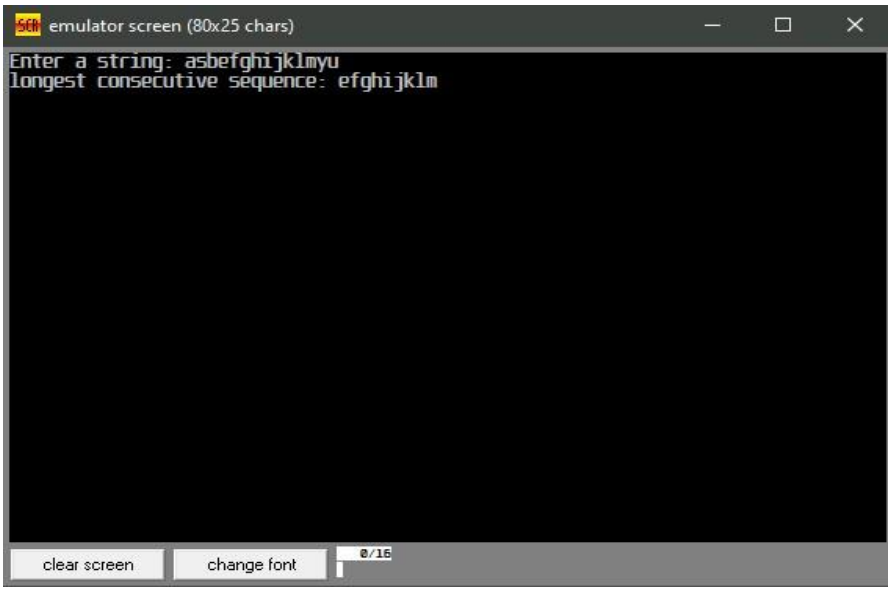
Code:

```
.MODEL SMALL
.STACK 100H

.DATA
   A DB 0
   C DB 0
   MSG1 DB 'Enter a string : $'
   MSG2 DB 0DH,0AH, 'longest consecutive sequence : $'
   MSG3 DB 0DH,0AH, 'Maximum length is : $'
.CODE

   MAIN PROC
      MOV AX,@DATA
      MOV DS,AX
      MOV AH,9
      LEA DX,MSG1
      INT 21H

      START:
         MOV AH,1
         INT 21H
         INC A
         JE LEVEL_1
         MOV CL,1
         MOV BL,AL
         MOV DH,AL

         INPUTS:
            INT 21H
            INC A
            CMP AL,0DH
            JE LEVEL_1
            INC BL
            CMP BL,AL
```

```
        JNE INI
        INC CL
        JMP INPUTS

    INI:
        CMP CH,CL
        JL UPDATE
        MOV CL,1
        MOV BL,AL
        MOV DH,AL
        JMP INPUTS

        UPDATE:
            MOV CH,CL
            MOV BH,DH
            MOV CL,1
            MOV BL,AL
            MOV DH,AL
            JMP INPUTS

    LEVEL_1:
        CMP CH,CL
        JL UPDATE2
        JMP LEVEL_2

        UPDATE2:
            MOV CH,CL
            MOV BH,DH
            JMP LEVEL_2

    LEVEL_2:
            MOV AH,9
            LEA DX,MSG2
            INT 21H
            MOV AH,2
            MOV DL,BH
            MOV CL,CH

    OUTPUT:
        CMP CH,0
        JE FINISH
        ADD C,1
        DEC CH
        INT 21H
        INC DL
        JMP OUTPUT

    FINISH:

MOV AH,4CH
INT 21H
```

```
    MAIN ENDP
END MAIN
```

Output:



Discussion:

In this above program, it will find the longest consecutive sequence of a given string and will count the length of that longest consecutive sequence. To implement the program many functions are used and conditional operator like JE ,JNE ,JNGE etc. is used. And for storing message string double (DB) type MSG1,MSG2 variables were declared and used in the program.

Experiment Name :

Write a program that identifies a hexadecimal number, EVEN or ODD using Shift.

Theory:

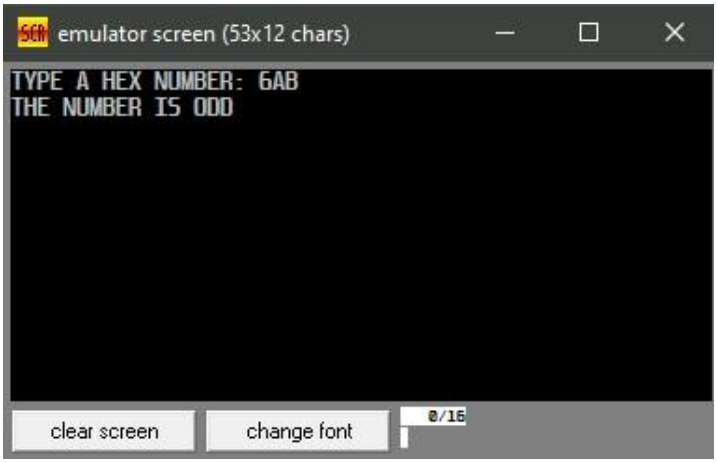
The objective of this program is to identify even or odd a hexadecimal number and it needs to be done using the left shift method of Assembly language. A hexadecimal number is basically holds 0-9 and A-F. Left Shift in Assembly means the bitwise shift towards left of a binary stream.

Code:

```
.MODEL SMALL
.STACK 100H
.DATA
   M1 DB 'TYPE A HEX NUMBER: $'
   M2 DB 'THE NUMBER IS EVEN$'
   M3 DB 'THE NUMBER IS ODD$'
.CODE
MAIN PROC
   MOV AX, @DATA
   MOV DS, AX

   XOR BX,BX

   MOV AH, 9
   LEA DX, M1
   INT 21H

   INPUT_LOOP:
      MOV AH, 1
      INT 21H
      CMP AL, 0DH
      JE CHECK

      CMP AL, 39H
      JG LETTER

      AND AL, 0FH
      JMP SHIFT
      LETTER:
      SUB AL, 37H
      SHIFT:
      SHL BX, 4
      OR BL, AL
   JMP INPUT_LOOP

   CHECK:
   SHR BX,1
   JNC EVEN:
```

```
    MOV AH, 2
    MOV DL, 0DH
    INT 21H
    MOV DL, 0AH
    INT 21H

    MOV AH, 9
    LEA DX, M3
    INT 21H
    JMP L

    EVEN:
    MOV AH, 2
    MOV DL, 0DH
    INT 21H
    MOV DL, 0AH
    INT 21H
    MOV AH, 9
    LEA DX, M2
    INT 21H

    L:
    MOV AH, 4CH
    INT 21H
MAIN ENDP
END MAIN
```

Output:



Discussion:

In the above assembly code, a hexadecimal number was taken as input using loop. After that, That very hex number was right shifted once. Then the Carry Flag (CF) was checked. If CF= 0 then the number is even, otherwise it is odd. That is how the program was done.