

MAWLANA BHASHANI SCIENCE AND TECHNOLOGY UNIVERSITY

SANTOSH, TANGAIL-1902



DEPARTMENT OF INFORMATION AND COMMUNICATION TECHNOLOGY

Course Title: Microprocessor and Embedded System Lab

Course Code: ICT-2204

Experiment Name: Problem Solving with Assembly Language - II

Lab Report No: 03

Submitted By	Submitted To
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Experiment no: 03

Experiment name: Problem Solving with Assembly Language – II.

Program 1: A program to (a) displays a "?", (b) read two decimal digits whose sum is less than 10, (c) display them and their sum on the next line, with an appropriate message.

Sample execution:

?27

The sum of 2 and 7 is 9

Code:

```
.model small
.data
m db 0ah,0dh,"Kuldip Saha Mugdha IT22018 $"
msg db 0ah,0dh,"THE SUM OF "
c1 db ?, " AND "
c2 db ?, " IS "
sum db ?, "$"
.code
main proc
    mov ax, @data
    mov ds, ax

    lea dx, m
    mov ah, 9
    int 21h

    mov ah, 2
    mov dl, '?'
    int 21h

    mov ah, 1
    int 21h
    mov c1, al

    int 21h
    mov c2, al

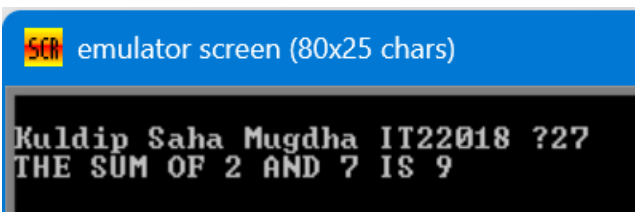
    add al, c1
    sub al, 30h
    mov sum, al

    lea dx, msg
    mov ah, 9
    int 21h

    mov ah, 4ch
    int 21h

main endp
end main
```

Output:



emulator screen (80x25 chars)

```
Kuldip Saha Mugdha IT22018 ?27
THE SUM OF 2 AND 7 IS 9
```

Program 2: A program to (a) prompt the user, (b) read first, middle, and last initials of a person's name, and (c) display them down the left margin.

Sample execution:

Enter three

initials: JFK

J

F

K

Code:

```
.MODEL SMALL
.DATA
m db 0ah,0dh,"Kuldip Saha Mugdha IT22018 $"
MSG DB 0AH,0DH,"ENTER THREE INITIALS: $"
C1 DB ?,0AH,0DH
C2 DB ?,0AH,0DH
C3 DB ?, '$'
.CODE
MAIN PROC
MOV AX,@DATA ;initialize DS
MOV DS,AX

MOV AH,9 ; display MSG
LEA DX,m
INT 21H

MOV AH,9 ; display MSG
LEA DX,MSG
INT 21H

MOV AH,1 ; read & store 1st char.
INT 21H
MOV C1,AL

INT 21H ; read & store 2nd char.
MOV C2,AL

INT 21H ; read & store 3rd char.
MOV C3,AL

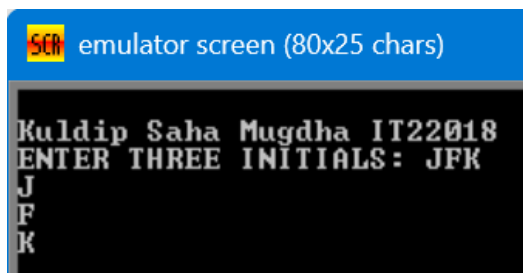
MOV AH,2 ; display enter
MOV DL,0AH
INT 21H
MOV DL,0DH
INT 21H

MOV AH,9 ; display message from c1 until $
LEA DX,C1
INT 21H

MOV AH,4CH ; return to DOS
INT 21H

MAIN ENDP
END MAIN
```

Output:



```
emulator screen (80x25 chars)
Kuldip Saha Mugdha IT22018
ENTER THREE INITIALS: JFK
J
F
K
```

Program 3: A program to read one of the hex digits A-F, and display it on the next line in decimal. Enter a hex digit A-F: C

In decimal it is: 12

Code:

```
.model small
.stack 100h
.data
m db 0ah,0dh,"Kuldip Saha Mugdha IT22018 $"
msg db 0ah,0dh,"Enter a HEX digit(A-F): $"
msg1 db 0ah,0dh,"In decimal it is: 1"
c db ?, "$"

.code
main proc
    mov ax,0data
    mov ds,ax
    mov ah,9
    lea dx,m|
    int 21h
    lea dx,msg
    int 21h

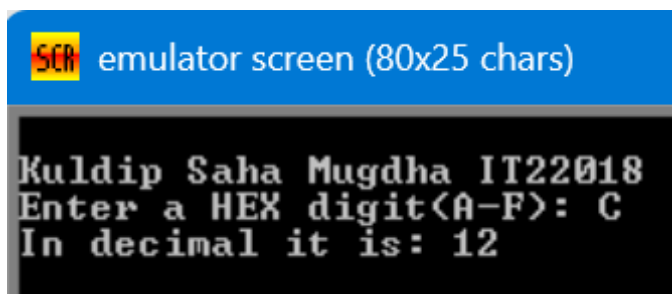
    mov ah,1
    int 21h
    sub al,11h

    mov c,al

    mov ah,9
    lea dx,msg1
    int 21h

    mov ah,4ch
    int 21h
    main endp
end main
```

Output:

The screenshot shows a terminal window titled "emulator screen (80x25 chars)". The output of the program is displayed in three lines: "Kuldip Saha Mugdha IT22018", "Enter a HEX digit(A-F): C", and "In decimal it is: 12". The text is in a monospaced font on a black background.

```
emulator screen (80x25 chars)
Kuldip Saha Mugdha IT22018
Enter a HEX digit(A-F): C
In decimal it is: 12
```

Program 4: A program to display a 10 x 10 solid box of asterisks.

Hint: declare a string in the data segment that specifies the box, and display it with INT 21h, function 9h.

Code:

```
.DATA
STARS DB 0AH,0DH,'*****','$'
m db 0ah,0dh,'Kuldip Saha Mugdha IT22018 $'
.CODE
MAIN PROC

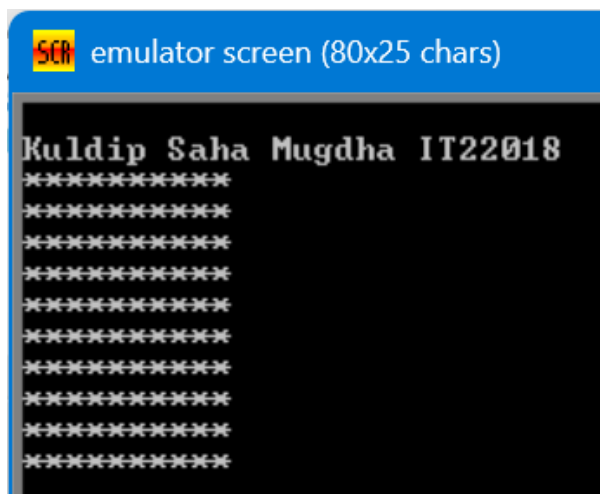
MOV AX,@DATA ;initialize DS
MOV DS,AX

mov ah,9
lea dx,m
int 21h

MOV AH,9 ; prepare to display
LEA DX,STARS
INT 21H ; display 10 times *
INT 21H
INT 21H
INT 21H
INT 21H
INT 21H
INT 21H
INT 21H
INT 21H
INT 21H
INT 21H
MOV AH,4CH ;return to DOS
INT 21H

MAIN ENDP
END MAIN
```

Output:



Program 5: A program to (a) display "?", (b) read three initials, (c) display them in the middle of an 11 x 11 box of asteriks, and (d) beep the computer.

Code:

```
.model small
.stack 100h
.data
msg1 db "Kuldip Saha Mugdha IT22018 $"
m1 db 0dh,0ah,'*****',0ah,0dh
m2 db '*****',0ah,0dh
m3 db '*****',0ah,0dh
m4 db '*****',0ah,0dh
m5 db '*****',0ah,0dh
m6 db '*****'
c1 db ?
c2 db ?
c3 db ?
m7 db '*****',0ah,0dh
m8 db '*****',0ah,0dh
m9 db '*****',0ah,0dh
m10 db '*****',0ah,0dh
m11 db '*****',0ah,0dh
m12 db '*****','?'

.code
main proc
    mov ax,@data
    mov ds,ax

    lea dx,msg1
    mov ah,9
    int 21h

    mov ah,2
    mov dl,'?'
    int 21h

    mov ah,1
    int 21h
    mov c1,al

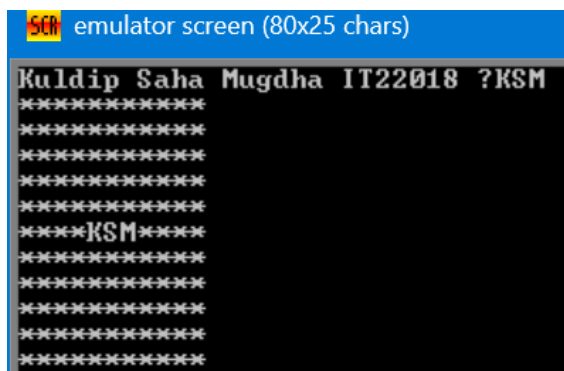
    int 21h
    mov c2,al

    int 21h
    mov c3,al

    lea dx,m1
    mov ah,9
    int 21h

    mov ah,4ch
    int 21h
main endp
```

Output:



emulator screen (80x25 chars)

```
Kuldip Saha Mugdha IT22018 ?KSM
*****
*****
*****
*****
****KSM****
*****
*****
*****
*****
*****
```