Lab Task 5

Course Tittle: Microprocessor and Microcontroller Lab

Course Code: CSE3102

Section: 3

Submitted To

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Problem 1

Write three separate programs in assembly language to find the sum of the following series

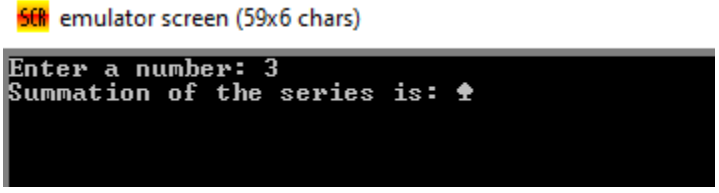
a. 1+2+3+4+....+n

Code

```
include 'emu8086.inc'
.model small
.stack 100h

.data
n db ?
a db 0
b db 1

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

print "Enter N : "
mov ah, 1
int 21h
sub al, 48

mov n, al

mov ch, 0
mov cl, n

mov bl, a

loop1:
add bl, b
inc b

loop loop1
```

```
        mov ah, 2
        mov dl, 10
        int 21h
        mov dl, 13
        int 21h

        print "Summation of the series is: "

        mov ah, 2
        mov dl, bl
        int 21h

        Exit:
        mov ah, 4ch
        int 21h

        main endp
end main
```

Output :



b. 1+3+5+7+.....+n-1

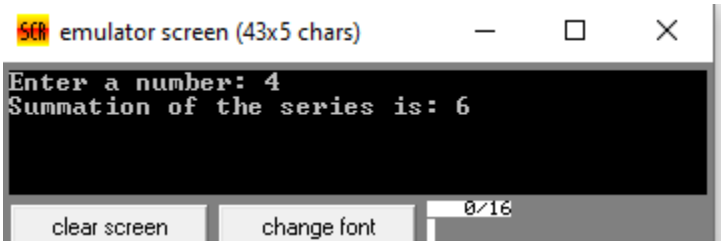
Code

```
        include 'emu8086.inc'
        .model small
        .stack 100h

        .data
        n db ?
        a db 0
        b db 1

        .code
```

```
main proc
mov ax, @data
mov ds, ax

print "Enter a number: "
mov ah, 1
int 21h
sub al, 48

mov n, al
sub n, 1

mov ch, 0
mov cl, n

mov bl, a

loop1:
add bl, b
inc b

loop loop1

add bl, 48

mov ah, 2
mov dl, 10
int 21h
mov dl, 13
int 21h

print "Summation of the series is: "

mov ah, 2
mov dl, bl
int 21h
```

```
        Exit:
        mov ah, 4ch
        int 21h

        main endp
end main
```

Output:



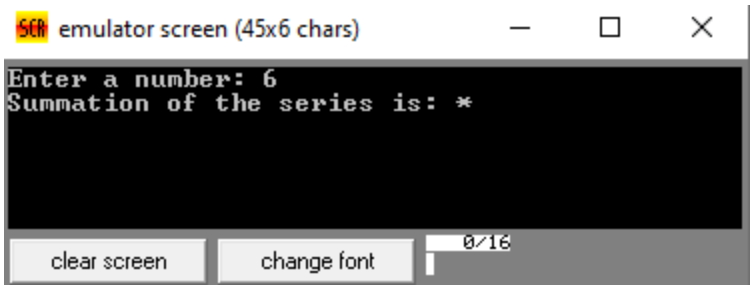
c. 2+4+6+8+.....+n

Code

```
        include 'emu8086.inc'
        .model small
        .stack 100h

        .data
        n db ?
        a db 0
        b db 2

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

        print "Enter a number: "
        mov ah, 1
        int 21h
        sub al, 48

        mov n, al

        mov ch, 0
```

```
        mov cl, n

        mov bl, a

        loop1:
        add bl, b
        inc b
        inc b

        loop loop1

        ;add bl, 48

        mov ah, 2
        mov dl, 10
        int 21h
        mov dl, 13
        int 21h

        print "Summation of the series is: "

        mov ah, 2
        mov dl, bl
        int 21h

        Exit:
        mov ah, 4ch
        int 21h

        main endp
end main
```

Output:



Problem 2 : The problem is to take N-size string input from the user input and generate a reverse string of the input.

Input: ABCD

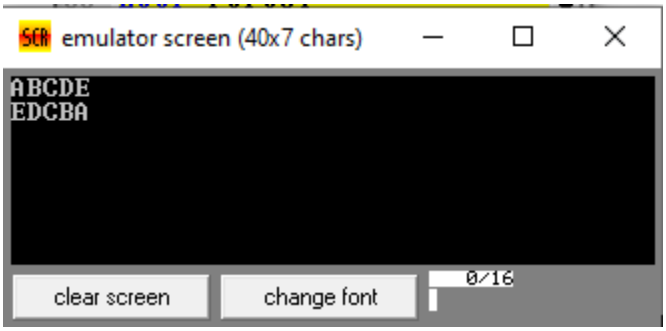
Output: DBCA

Code

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



.CODE
MAIN PROC

   MOV CX, 0

   PUSHIN:

      MOV AH, 1
      INT 21H
      MOV BL, AL

      CMP BL, 0DH
      JE NEWLINE
      PUSH BX
      INC CX
      JMP PUSHIN
```

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

    POPOUT:
        POP DX
        INT 21H
        LOOP POPOUT
MAIN ENDP
END MAIN
```

Output



Problem 3 : Write an assembly code to input a word consisting of uppercase and lowercase letters. If there is no uppercase letter the program will output, "No uppercase letters". And if there is uppercase letter the program will output the first and last uppercase letter.

Code

```
TITLE FIRST_LAST_UPPERCASE

include "emu8086.inc"
.MODEL SMALL
.STACK 100H
```

```
.DATA

a db 0
b db 0



.CODE



MAIN PROC

   MOV CX, 0

   PUSHIN:

      MOV AH, 1
      INT 21H
      MOV BL, AL

      CMP BL, 0DH
      JE NEWLINE
      INC CX
      CMP BL, "Z"
      JLE FIRST
      JMP PUSHIN

   FIRST:
   mov a,bl
   PUSHINX:

      MOV AH, 1
      INT 21H
      MOV BL, AL

      CMP BL, 0DH
      JE NEWLINE
      INC CX
```

```
    CMP BL, "Z"
    JLE LAST
    JMP PUSHINX
  LAST:
  mov b,bl
  jmp pushinx


  NEWLINE:
      MOV AH, 2       ;DISPLAY NEWLINE
      MOV DL, 0DH
      INT 21H
      MOV DL, 0AH
      INT 21H



cmp a,0
je NO_BIG
cmp b,0
je ONEBIG


print "The first uppercase leter is : "


mov dl, a
mov ah,2
int 21h



print "The last uppercase leter is : "


mov dl,b
mov ah,2
```

```
int 21h

jmp exit



ONEBIG:




print "FIRST & LAST upper case letter is : "



mov dl, a
mov ah,2
int 21h

jmp exit

NO_BIG:

print "No uppercase letters"

EXIT:
mov ah,4ch ; exit program
int 21h

MAIN ENDP
END MAIN
```

Output