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**Section: 08**

**Assignment 4**

**Task 01:**

.MODEL SMALL

.STACK 100h

.DATA

MSG1 db "Enter a number:$"

MSG2 db "The sum is $"

.CODE

MAIN PROC

MOV AX, @DATA

MOV DS, AX

;printing the prompt message

MOV AH, 9

LEA DX, msg1

INT 21h

;taking the input number and moving it to BL

MOV AH, 1

INT 21h

MOV BL, AL

;variable BH will contain the sum, subtracting 30h from BL to get the actual number in register and I am using implicit loop

MOV BH, 0

SUB BL, 30h

MOV CX, 5

CALC\_SUM:

ADD BH, BL

ADD BL, 4

LOOP CALC\_SUM

;going to new line where cursor will be at the beginning

MOV AH, 2

MOV DL, 0Dh

INT 21h

MOV DL, 0Ah

INT 21h

;Now dividing the sum by 10 to get two digit of answer

MOV AH, 0

MOV AL, BH

MOV BL, 10

DIV BL

;adding 30h with both remainder and quotient to find the ascii code of the values

ADD AH, 30h

ADD AL, 30h

MOV BX, AX

;printing the output

MOV AH, 9

LEA DX, msg2

INT 21h

MOV AH, 2

MOV DL, BL

INT 21h

MOV DL, BH

INT 21h

MOV AX, 4C00h

INT 21h

MAIN ENDP

END MAIN

**Task 02:**

.MODEL SMALL

.STACK 100h

.DATA

MSG1 db "Enter First Number: $"

MSG2 db "Enter Second Number: $"

.CODE

MAIN PROC

MOV AX, @DATA

MOV DS, AX

;printing the prompt message

MOV AH, 9

LEA DX, MSG1

INT 21h

;taking the input number and moving it to BL

MOV AH, 1

INT 21h

MOV BL, AL

;going to new line where cursor will be at the beginning

MOV AH, 2

MOV DL, 0Dh

INT 21h

MOV DL, 0Ah

INT 21h

;printing the prompt message

MOV AH, 9

LEA DX, MSG2

INT 21h

;taking the input number and moving it to BH

MOV AH, 1

INT 21h

MOV BH, AL

;subtracting 30h from BL and BH to get the actual number in register

SUB BL, 30h

SUB BH, 30h

;DL will store the multiplied value and I am using implicit loop

MOV DL, 0

MOV CH, 0

MOV CL, BH

CALC\_MUL:

ADD DL, BL

LOOP CALC\_MUL

;copying the value of DL to BL so that the value doesn't get lost

MOV BL, DL

;going to new line where cursor will be at the beginning

MOV AH, 2

MOV DL, 0Dh

INT 21h

MOV DL, 0Ah

INT 21h

;Now dividing the result by 10 to get two digit of answer

MOV AH, 0

MOV AL, BL

MOV CL, 10

DIV CL

;adding 30h with both remainder and quotient to find the ascii code of the values

ADD AH, 30h

ADD AL, 30h

MOV DX, AX

;printing the output

MOV AH, 2

;checking whether the sum is of two digit or one digit

CMP DL, 30h

JE ONE\_DIGIT

INT 21h

ONE\_DIGIT:

MOV DL, DH

INT 21h

MOV AX, 4C00h

INT 21h

MAIN ENDP

END MAIN

**Task 03:**

.MODEL SMALL

.STACK 100h

.DATA

MSG1 db "Enter First Number: $"

MSG2 db "Enter Second Number: $"

MSG3 db "Output: $"

.CODE

MAIN PROC

MOV AX, @DATA

MOV DS, AX

;printing the prompt message

MOV AH, 9

LEA DX, MSG1

INT 21h

;taking the input number and moving it to BL

MOV AH, 1

INT 21h

MOV BL, AL

;going to new line where cursor will be at the beginning

MOV AH, 2

MOV DL, 0Dh

INT 21h

MOV DL, 0Ah

INT 21h

;printing the prompt message

MOV AH, 9

LEA DX, MSG2

INT 21h

;taking the input number and moving it to BH

MOV AH, 1

INT 21h

MOV BH, AL

;subtracting 30h from BL and BH to get the actual number in register

SUB BL, 30h

SUB BH, 30h

;CH will store the sum of the numbers divided by 3, BL is loop controler and I am using explicit loop

MOV CH, 0

MOV CL, 3

CALC\_SUM:

CMP BL, BH

JG LOOP\_EXIT

MOV AH, 0

MOV AL, BL

DIV CL

CMP AH, 0

JNE INC\_BL

ADD CH, BL

INC\_BL:

INC BL

JMP CALC\_SUM

LOOP\_EXIT:

;going to new line where cursor will be at the beginning

MOV AH, 2

MOV DL, 0Dh

INT 21h

MOV DL, 0Ah

INT 21h

;printing the prompt message

MOV AH, 9

LEA DX, MSG3

INT 21h

;Now dividing the result by 10 to get two digit of answer

MOV AH, 0

MOV AL, CH

MOV CL, 10

DIV CL

;adding 30h with both remainder and quotient to find the ascii code of the values

ADD AH, 30h

ADD AL, 30h

MOV DX, AX

;printing the output

MOV AH, 2

;checking whether the sum is of two digit or one digit

CMP DL, 30h

JE ONE\_DIGIT

INT 21h

ONE\_DIGIT:

MOV DL, DH

INT 21h

MOV AX, 4C00h

INT 21h

MAIN ENDP

END MAIN

**Task 04:**

.MODEL SMALL

.STACK 100h

.DATA

MSG1 db 'how many numbers (1-9) do you want to enter? $'

MSG2 db 'Enter a hex value 0-9 or A-F(capital letter): $'

MSG3 db 'Sum is: $'

.CODE

MAIN PROC

MOV AX, @DATA

MOV DS, AX

;printing the prompt message

MOV AH, 9

LEA DX, MSG1

INT 21h

;taking the input number and moving it to CL

MOV AH, 1

INT 21h

MOV CL, AL

;going to new line where cursor will be at the beginning

MOV AH, 2

MOV DL, 0Dh

INT 21h

MOV DL, 0Ah

INT 21h

;subtracting 30h from CL to get the actual number in register

SUB CL, 30h

MOV CH, 0

MOV BH, 0

;I am using implicit loop to take the inputs and adding them to BH

CALC\_SUM:

;printing the prompt message

MOV AH, 9

LEA DX, MSG2

INT 21h

MOV AH, 1

INT 21h

CMP AL, 65

JGE GTE10

SUB AL, 48

JMP ADD\_NUM

GTE10:

SUB AL, 55

ADD\_NUM:

ADD BH, AL

;going to new line where cursor will be at the beginning

MOV AH, 2

MOV DL, 0Dh

INT 21h

MOV DL, 0Ah

INT 21h

LOOP CALC\_SUM

;printing the prompt message

MOV AH, 9

LEA DX, MSG3

INT 21h

;Now dividing the result by 10h to get two digit of answer

MOV AH, 0

MOV AL, BH

MOV CL, 10h

DIV CL

MOV DX, AX

;printing the output

MOV AH, 2

;checking whether the sum is of two digit or one digit

CMP DL, 0

JE ONE\_DIGIT

;checking whether the digit is greater than or equal to 10 or not

CMP DL, 10

JGE ADD55

ADD DL, 48

INT 21h

JMP ONE\_DIGIT

ADD55:

ADD DL, 55

INT 21h

ONE\_DIGIT:

MOV DL, DH

;checking whether the digit is greater than or equal to 10 or not

CMP DL, 10

JL ADD48

ADD DL, 55

INT 21h

JMP EXIT

ADD48:

ADD DL, 48

INT 21h

EXIT:

MOV AX, 4C00h

INT 21h

MAIN ENDP

END MAIN