MAWLANA BHASHANI SCIENCE AND TECHNOLOGY UNIVERSITY

Santosh,Tangail-1902

LAB REPORT

Lab Report No : 06

Lab Report name : Assembly Language-06

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Course Code : ICT- 3106

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MBSTU

01.Write a program in assembly language to check whether a number is even or odd.

Algorithm:

1.Start the program.

2.Take one input.

3.check whether it is even or odd.

4.If even print “Even” otherwise print “Odd”.

5.Stop the program.

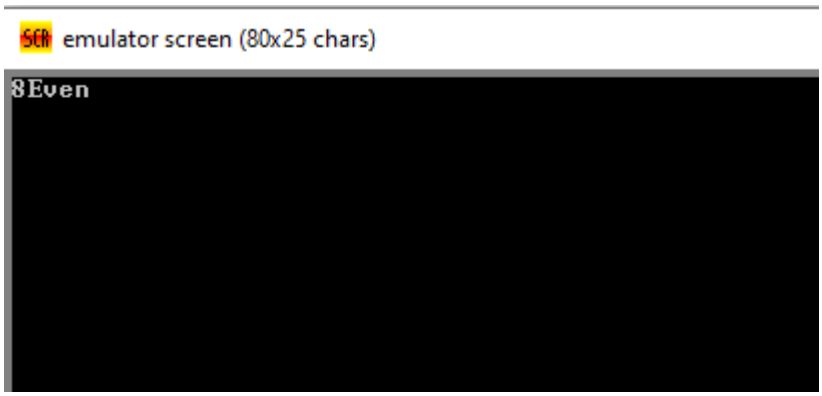
Source code:

```
.model small
.stack 100h
.data
even db 'Even$'
odde db 'Odd$'
.code
main proc
 mov ax,@data
 mov ds, ax
 mov ah,1
 int 21h
 mov bl,al
 test bl,01h
 jne odd
  mov ah, 9
 lea dx,even
```

```
int 21h
jmp exit

odd:
mov ah,9
lea dx,odde
int 21h
exit:
mov ah,4ch
int 21h
main endp
end main
```

Output:



02.Write a program in assembly language to load a byte in memory location 8000H and increment the contents of the memory location.

Source code:

```
DATA SEGMENT

NUM1 DB 7H

NUM2 DB ?

ENDS

CODE SEGMENT

ASSUME DS:DATA CS:CODE

START:

MOV AX,DATA

MOV DS,AX

MOV AL,NUM1

MOV [8000H],AL

INC [8000H]

MOV AL,[8000H]

MOV NUM2,AL

MOV AH,4C

INT 21H

ENDS

END START
```

3. Write a program in assembly language to swap two numbers.

Source code:

```
.MODEL SMALL

.STACK 100H

.DATA

 NUM1 DB '6'
```

```
 NUM2 DB '5'
.CODE
 MOV AX , @DATA
 MOV DS , AX
 MOV BL , NUM1
 MOV CL , NUM2
 MOV NUM2 , BL
 MOV NUM1 , CL

 MOV AH,2
 MOV DL,NUM1
 INT 21H
 MOV DL,NUM2
 INT 21H
 EXIT:
 MOV AH , 4CH
 INT 21H
END
```

Output:

04. Write Assembly program to read ten (10) characters from console.

Source code:

```
.model small

.stack 100h

.data

arr db 10 dup(?)

.code

main proc

 mov ax,@data

 mov ds,ax


 mov cx,10

 mov si,offset arr

  loop1:

 mov ah,1

 int 21h

 mov [si],al

 inc si
```

```
loop loop1

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

mov si,offset arr
mov cx,10

loop2:
mov dl,[si]
mov ah,2
int 21h

mov dl,32
mov ah,2
int 21h

inc si
loop loop2
```

Output:

05. Write an Assembly program to read in two decimal inputs and print out the smaller of the two, in decimal.

Algorithm:

1.Start the program.

2.Enter two numbers in ‘bl’ and ‘bh’ register from ‘al’ register.

3.compare two number.

4.If ‘bl’ is small jump to l2 else jump l1.And Display the smaller number.

5.Stop the program

Source code:

```
.model small

.stack 100h

.data

.code

main proc

 mov ah,1

 int 21h

 mov bl,al

 int 21h

 mov bh,al
```

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

cmp bl,bh
jl l1
jmp l2

l2:
mov ah,2
mov dl,bh
int 21h
jmp exit

l1:
mov ah,2
mov dl,bl
int 21h
jmp exit
exit:
mov ah,4ch
int 21h
main endp
```

end main

Output:

06. Write an Assembly program to calculate the average of three given numbers stored in memory.

Algorithm:

1.Start the program.

2.Define three variables.

3.Initialize those variables.

4.Move num1 to al register.add num2 and num3 to al register.

5.set the value of ah register value as 0

6.Set the value of dl register as 3.

7.perform div operation.

8.Stop the program.

Source code:

.model small

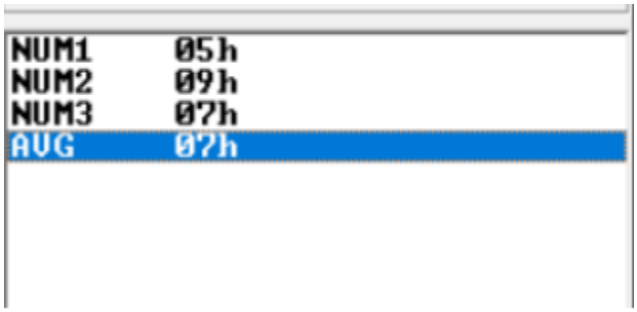
```
.stack 100h
.data
num1 db 5
num2 db 9
num3 db 7
avg db ?
.code
main proc
 mov ax,@data
 mov ds,ax

 mov al,num1
 add al,num2
 add al,num3
 mov ah,0
 mov dl,3
 div dl

 mov avg,al

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

Output:



07. Write an Assembly program in which a procedure converts Hexadecimal value to print its Decimal form on Screen.

Algorithm:

1.start the program.

2.Enter a hex digit.

3.Compare the digit .if it is greater than 9 then jump to hex level else jump to num level.

4.In num level just print the number.

5.in hex level print the decimal value of the hex digit.

6.Stop the program.

Source code:

```
.model small

.stack 100h

.data

msg1 db 10,13,'ENTER A HEX DIGIT:$'

msg2 db 10,13,'IN DECIMAL IS IT:$'

msg4 db 10,13,'ILLEGAL CHARACTER- ENTER 0-9 OR A-F:$'

.code

again:

 mov ax,@data
```

```
 mov ds,ax
 lea dx,msg1
 mov ah,9
 int 21h
 mov ah,1
 int 21h
 mov bl,al
 jmp go
go:
 cmp bl,'9'
 ja hex
 jb num
 je num
hex:
 cmp bl,'F'
 ja illegal
 lea dx,msg2
 mov ah,9
int 21h
 mov dl,49d
 mov ah,2
 int 21h
 sub bl,17d
 mov dl,bl
 mov ah,2
```

```
 int 21h
 jmp exit
num:
 cmp bl,'0'
 jb illegal
 lea dx,msg2
 mov ah,9
 int 21h
 mov dl,bl
 mov ah,2
 int 21h
 jmp exit
illegal:
 lea dx,msg4
 mov ah,9
 int 21h
 mov ah,1
 int 21h
 mov ah,1
 int 21h
 mov bl,al
 jmp go
exit:
end
```

Output:

08. Write an Assembly program to convert Centigrade (Celsius) to Fahrenheit temperature measuring scales.

Algorithm:

1.Start the program.

2.Enter a value to al register and sub 30h from this.

3.Store 0 to ah register and 10 to bl register.

4.Multiply bl register with al register.

5.Move the value of al register to bl register.

6.Move al register value to T.

7.Store 9 to dl register.

8.Multiply dl register with al register and divide with 5.

9.Display the value.

10.Stop the program.

Source code:

```
DATA SEGMENT

T DB ?
```

```
RES DB 10 DUP ('$')
MSG1 DB "ENTER TEMPERATURE IN CELSIUS (ONLY IN 2 DIGITS) : $"
MSG2 DB 10,13,"CONVERTED IS FAHRENHEIT (TEMPERATURE) : $"
DATA ENDS
CODE SEGMENT
ASSUME DS:DATA,CS:CODE
START:
MOV AX,DATA
MOV DS,AX
LEA DX,MSG1
MOV AH,9
INT 21H
MOV AH,1
INT 21H
SUB AL,30H
MOV AH,0
MOV BL,10
MUL BL
MOV BL,AL
MOV AH,1
INT 21H
SUB AL,30H
MOV AH,0
ADD AL,BL
MOV T,AL
```

```
MOV DL,9
MUL DL
MOV BL,5
DIV BL
MOV AH,0
ADD AL,32
LEA SI,RES
CALL HEX2DEC
LEA DX,MSG2
MOV AH,9
INT 21H
LEA DX,RES
MOV AH,9
INT 21H
MOV AH,4CH
INT 21H
CODE ENDS
HEX2DEC PROC NEAR
MOV CX,0
MOV BX,10
LOOP1: MOV DX,0
DIV BX
ADD DL,30H
PUSH DX
INC CX
```

```
CMP AX,9

JG LOOP1

ADD AL,30H

MOV [SI],AL

LOOP2: POP AX

INC SI

MOV [SI],AL

LOOP LOOP2

RET

HEX2DEC ENDP

END START
```

Output: