

# Microprocessor Lab Assessment-1

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## Task Assigned

WRITE ASSEMBLY LANGUAGE PROGRAMS TO PERFORM THE FOLLOWING

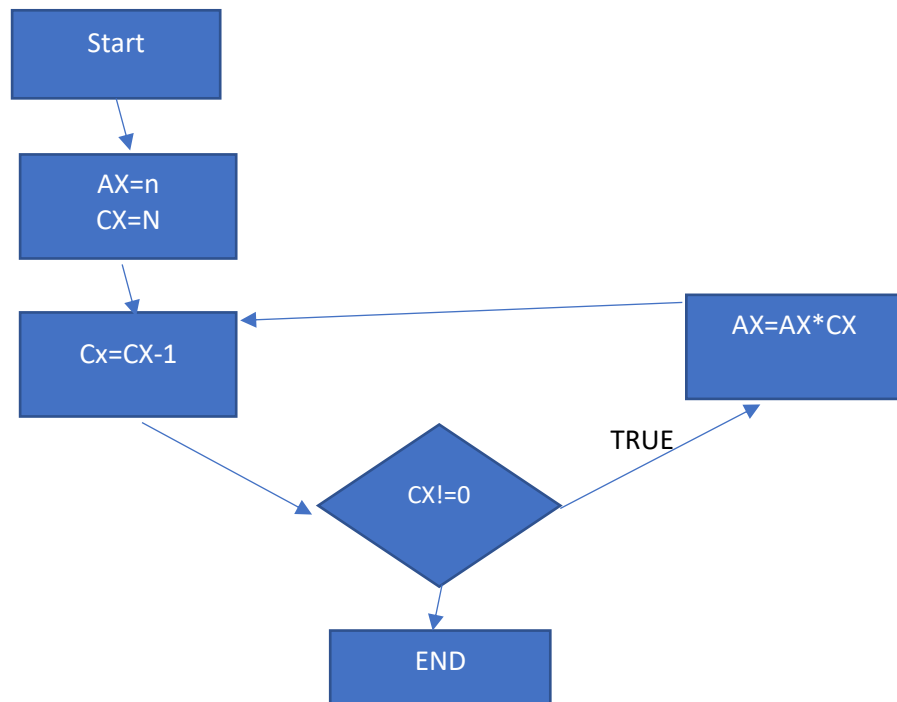
1. Factorial of a number
2. Largest number in the array
3. Grey code conversion

1)

AIM

To find the factorial of a number.

FLOWCHART



CODE

```
.model small
.stack 100h
.code
main proc
    mov AX,7h ;MOVE 7 TO AX AS WE ARE FINDING 7!
    mov cx,ax ;COPY AX TO COUNTER
    dec cx    ;DECREASE COUNTER BY 1 SO THAT MULTIPLICATION CAN BE DONE
fact:       ;LOOP LABEL
    mul cx   ;MULTIPLY WITH AX AND
    dec cx   ;DECREASE CX
    JNZ fact ;STOP WHEN CX=0
main endp
end main
```

## OUTPUT

registers		
	H	L
AX	13	B0
BX	00	00
CX	00	00
DX	00	00

Register AX = 13B0 (in hex)

Which is  $5040_{10}$  i.e. 7!

## RESULT/INFERENCE

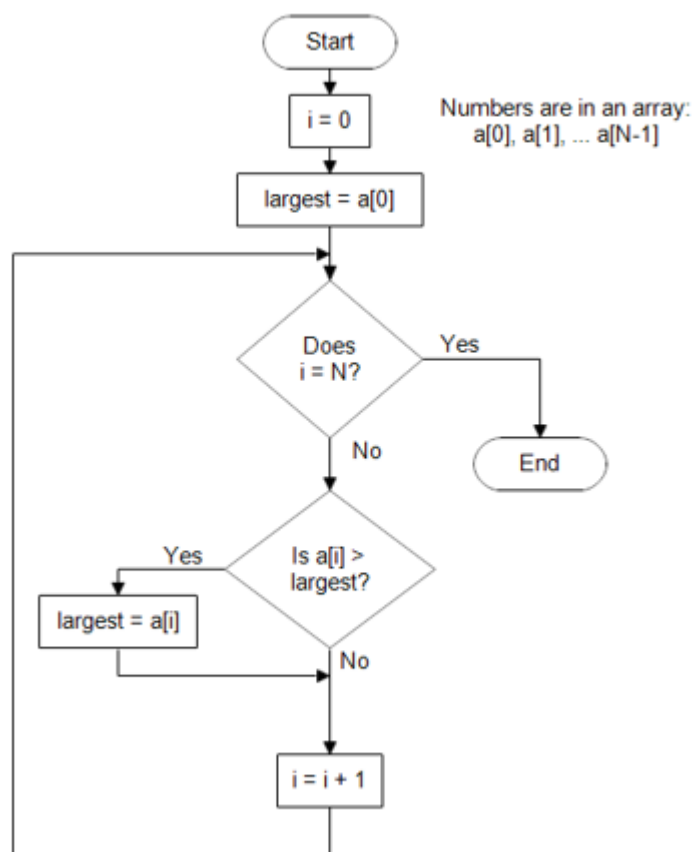
The Factorial of a number is calculated

2)

AIM

TO FIND THE LARGEST NUMBER IN AN ARRAY

## FLOWCHART



## CODE

```
.model small
.stack 100h
.data
array db 2,6,8,7
result db ?

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

    mov cx,4 ; array size is 4
    mov bl,0
    lea SI,array
l1:
    mov al,[si]
    cmp al,bl
    JL l2:
    mov bl,al
l2:
    inc si
    dec cx
    JNZ l1

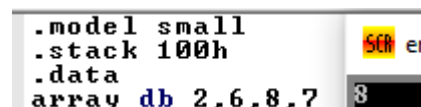
    mov result,bl
    mov dl,result

    add dl,48
    mov ah,2
    int 21h

    mov ah,4ch
    int 21h

main endp
end main
```

## OUTPUT

A screenshot of a code editor showing assembly code. The code includes directives for model, stack, and data, followed by an array of values 2, 6, 8, and 7. Below the code, there is a small window showing the output, which is the number 8. The code is color-coded: directives are in blue, data is in red, and the array values are in green. The output window has a yellow background and a black border.

```
.model small
.stack 100h
.data
array db 2,6,8,7
```

**FOR THIS ARRAY THE ANSWER IS 8**

## RESULTS

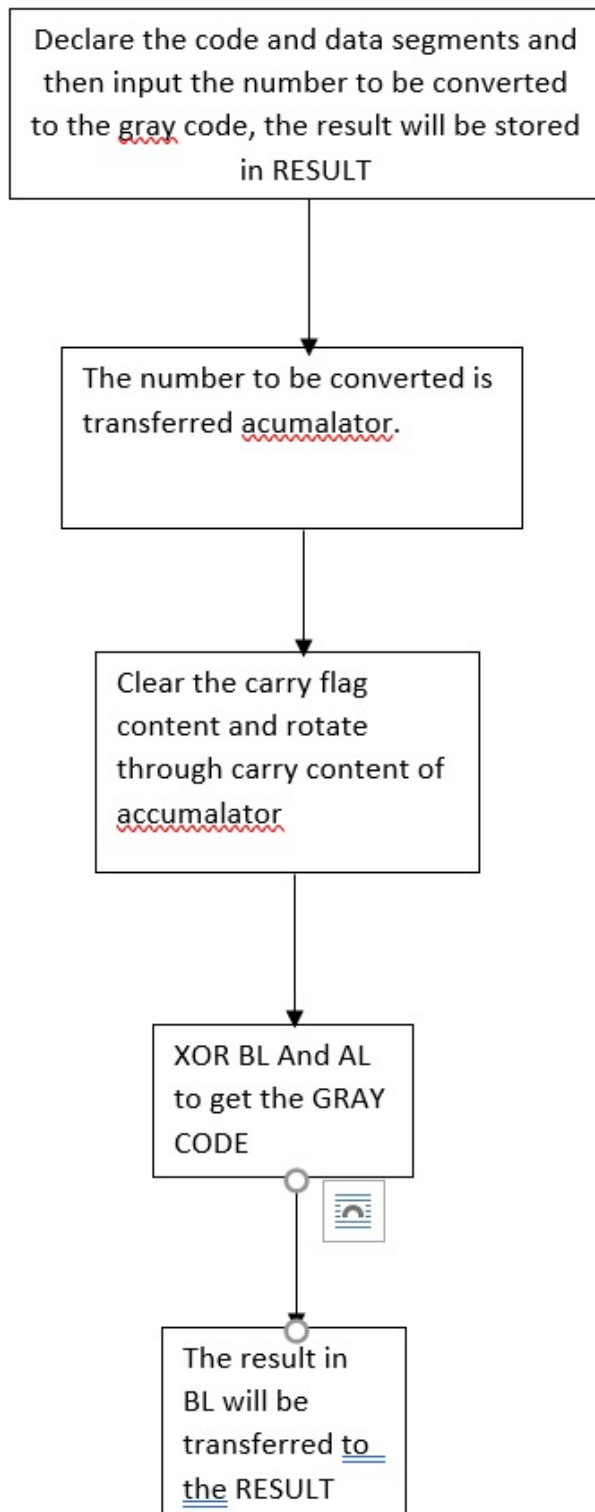
THE LARGEST NUMBER OF THE ARRAY IS CALCULATED

3)

AIM

TO FIND GREY CODE OF A GIVEN NUMBER

FLOWCHART



## CODE

```
.model small  
.stack 100h
```

```
assume cs:code,ds:data  
data segment  
    result db ?  
data ends
```

```
code segment  
Start:
```

```
    mov ax,data  
    mov ds,ax  
    mov al,07h  
    mov bl,al  
    clc  
    shr al,1    ;shift right by 1  
    xor bl,al   ;ans in b1
```

```
    mov result,bl  
    mov dl,result
```

```
    add dl,48  
    mov ah,2  
    int 21h    ; print answer
```

```
code ends  
end start
```

## OUTPUT

```
mov ax,ax  
mov al,07h  
mov bl,al  
clc
```

4

FOR GIVEN NUMBER 7 =  $(0111)_2$

GREY CODE = 0 (0 XOR 1) (1 XOR 1) (1 XOR 1) =  $(0100)_2 = (4)_{16}$

## RESULT

The grey code has been calculated