Microprocessor Lab Assessment-1

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Task Assigned

WRITE ASSEMBLY LANGUAGE PROGRAMS TO PERFORM THE FOLLOWING

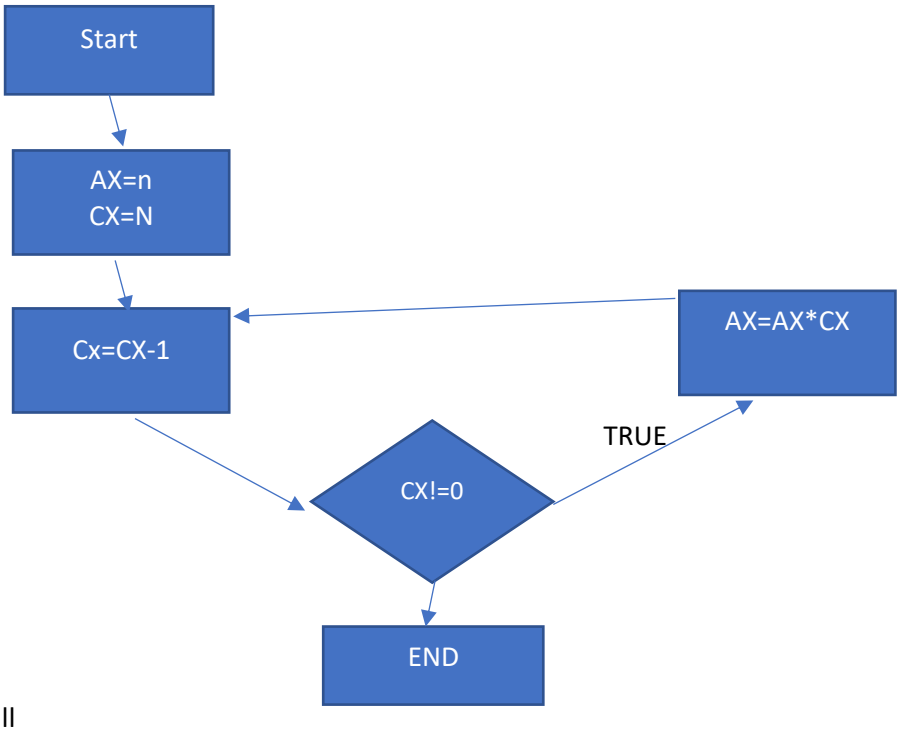
1. Factorial of a number
2. Largest number in the array
3. Grey code conversion

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

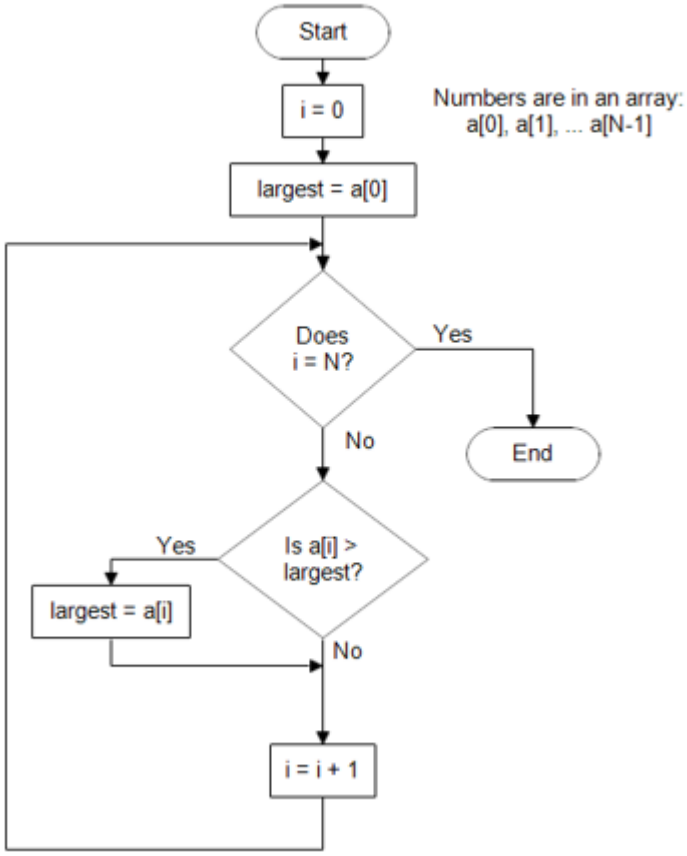
The Factorial of a number is calculated

2)

AIM

TO FIND THE LARGEST NUMBER IN AN ARRAY

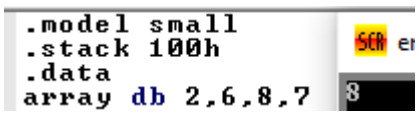
FLOWCHART



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



FOR THIS ARRAY THE ANSWER IS 8

RESULTS

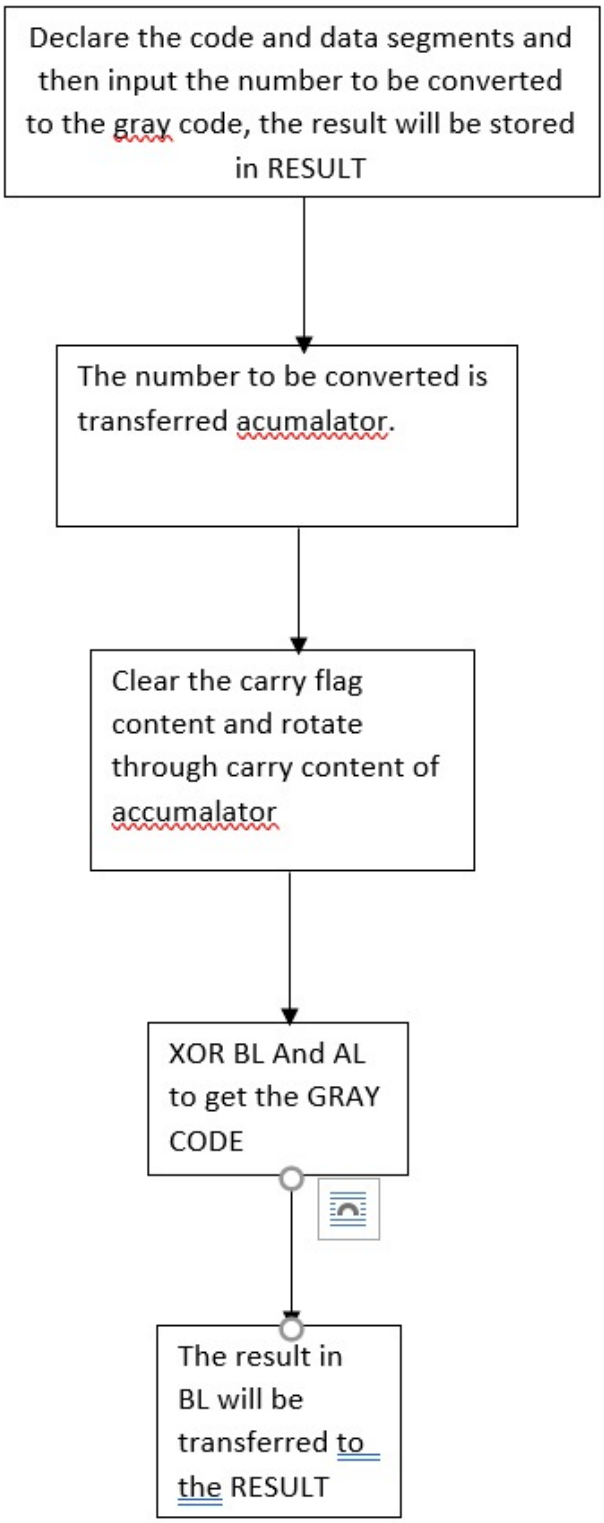
THE LARGEST NUMBER OF THE ARRAY IS CALCULATED

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

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