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# Experiment No. 9

**AIM - 8086 ALP to find Factorial of a number using MACRO and PROCEDURE.**

**Theory – A Macro** is a set of instructions grouped under a single unit. It is another method for implementing modular programming in the 8086 microprocessors

The Macro is different from the Procedure in a way that unlike calling and returning the control as in procedures, the processor generates the code in the program every time whenever and wherever a call to the Macro is made.

A Macro can be defined in a program using the following assembler directives:
MACRO (used after the name of Macro before starting the body of the Macro) ,
ENDM (at the end of the Macro).

All the instructions that belong to the Macro lie within these two assembler directives.
The following is the syntax for defining a Macro in the 8086 Microprocessor:

```
Macro_name  MACRO  [ list of parameters ]
   Instruction 1
   Instruction 2
   - - - - - - - - - - -
   - - - - - - - - - - -
   - - - - - - - - - - -
   Instruction n
ENDM
```

**MACRO call in main function -**

```
Macro_name [ list of parameters]
```

---

**Procedure -** A procedure is a set of code that can be branched to and returned from in such a way that the code is as if it were inserted at the point from which it is branched to. The branch to procedure is referred to as the call, and the corresponding branch back is known as the return. The return is always made to the instruction immediately following the call regardless of where the call is located.

```
Procedure_name PROC parametres
        --------------------------
        --------------------------
Procedure name ENDP

Procedure call –
PUBLIC   ARY, COUNT, SUM
```

---

**Program –**

```
DATA SEGMENT
NUM DB ?
FACT DB 1H
RES DB 10 DUP ('$')
MSG1 DB "ENTER NUMBER : $"
MSG2 DB 10,13,"RESULT : $"
DATA ENDS
```

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```
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 NUM,AL
MOV AH,0
MOV AL,FACT
MOV CH,0
MOV CL,NUM
LABEL1: MUL CL
LOOP LABEL1
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** –

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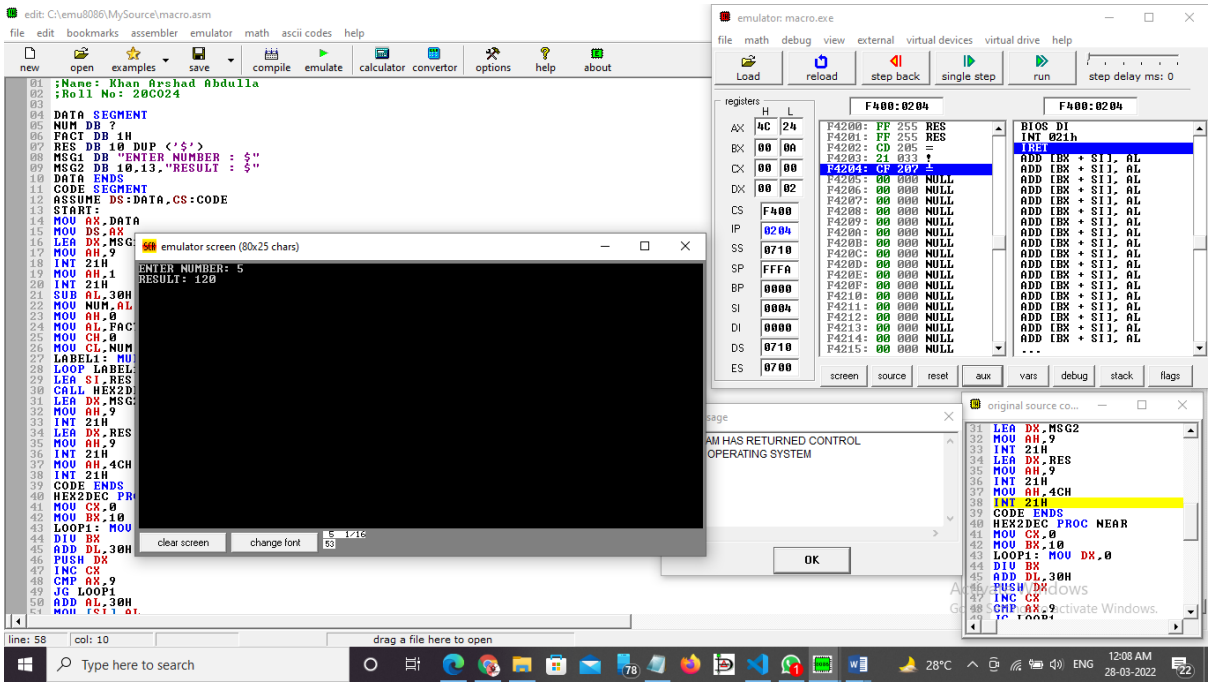


**Conclusion –** To find Factorial of a number using MACRO and PROCEDURE.