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Class/Sem:	SE/IV
Experiment No.:	2B
Title:	Program for calculating factorial using assembly language
Date of Performance:	30/01/2024
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Marks:	
Sign of Faculty:	

Aim: Program to calculate the Factorial of a number.

Theory:

To calculate the factorial of any number, we use MUL instruction. Here, initially, we initialize the first register by value 1. The second register is initialized by the value of the second register. After multiplication, decrement the value of the second register and repeat the multiplying step till the second register value becomes zero. The result is stored in the first register.

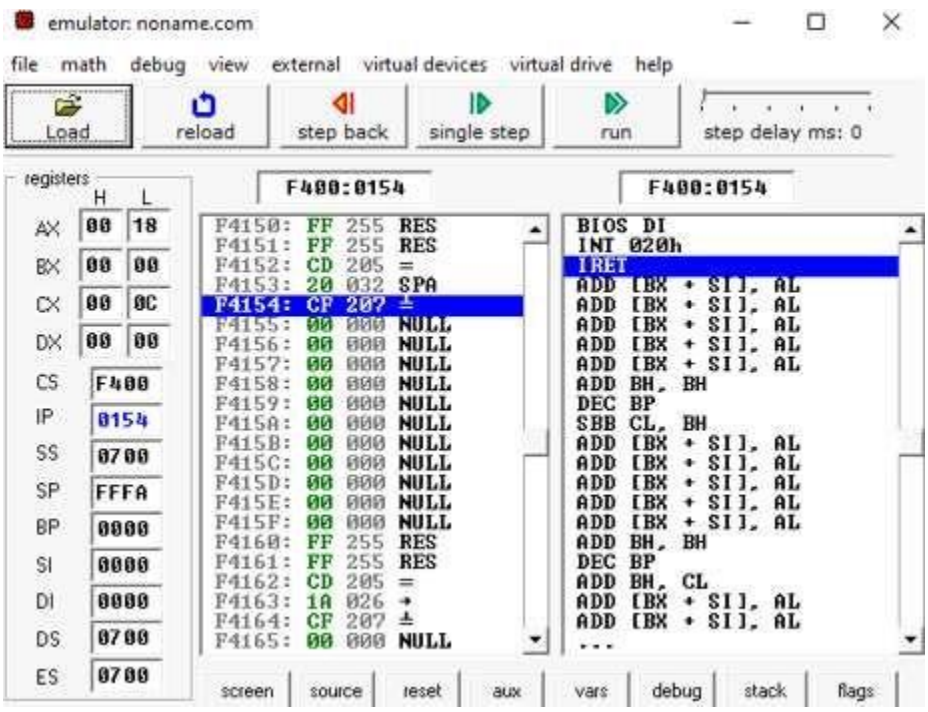
Algorithm:

1. Start.
2. Set AX=01H, and BX with the value whose factorial we want to find.
3. Multiply AX and BX.
4. Decrement BX=BX-1.
5. Repeat steps 3 and 4 till BX=0.
6. Stop.

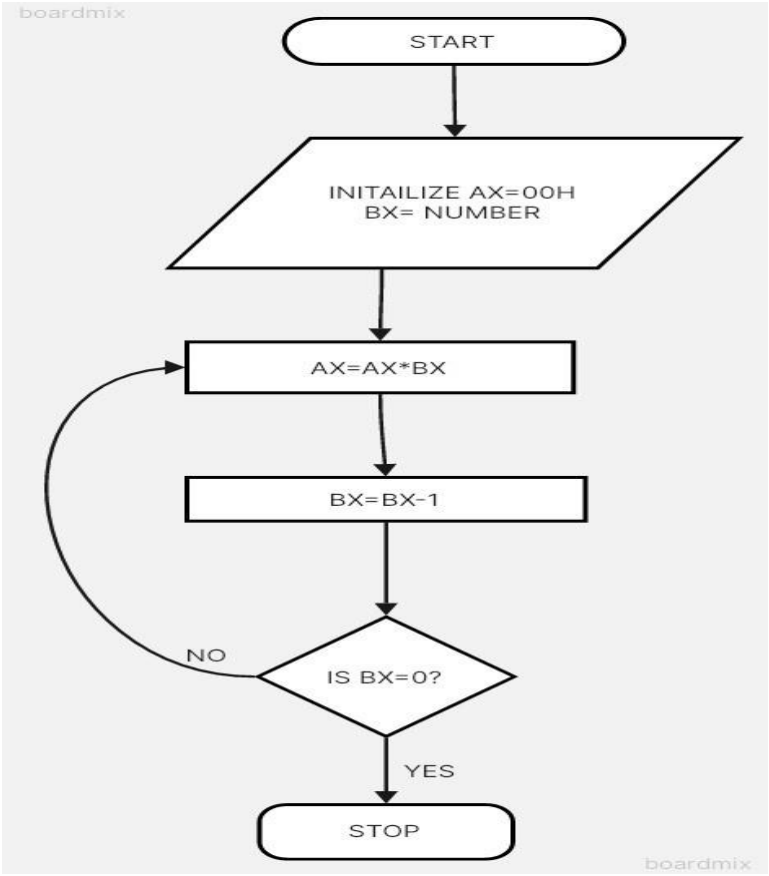
Code:

```
ORG 100H
MOV AX, 00H
MOV BX, 04H
MOV CX, 02H
L1: ADD AX, BX
    DEC CX
    JNZ L1
  RET
```

Output:-


emulator: noname.com
file math debug view external virtual devices virtual drive help
Load
reload
step back
single step
run
step delay ms: 0
registers
H L
AX 00 18
BX 00 00
CX 00 0C
DX 00 00
CS F400
IP 0154
SS 0700
SP FFFA
BP 0000
SI 0000
DI 0000
DS 0700
ES 0700
F400:0154
F4150: FF 255 RES
F4151: FF 255 RES
F4152: CD 205 =
F4153: 20 032 SPA
F4154: CF 207 ±
F4155: 00 000 NULL
F4156: 00 000 NULL
F4157: 00 000 NULL
F4158: 00 000 NULL
F4159: 00 000 NULL
F415A: 00 000 NULL
F415B: 00 000 NULL
F415C: 00 000 NULL
F415D: 00 000 NULL
F415E: 00 000 NULL
F415F: 00 000 NULL
F4160: FF 255 RES
F4161: FF 255 RES
F4162: CD 205 =
F4163: 1A 026 →
F4164: CF 207 ±
F4165: 00 000 NULL
F400:0154
BIOS DI
INT 020h
IRET
ADD [BX + SI], AL
ADD [BX + SI], AL
ADD [BX + SI], AL
ADD [BX + SI], AL
ADD [BX + SI], AL
ADD BH, BH
DEC BP
SBB CL, BH
ADD [BX + SI], AL
ADD [BX + SI], AL
ADD [BX + SI], AL
ADD [BX + SI], AL
ADD [BX + SI], AL
ADD BH, BH
DEC BP
ADD BH, CL
ADD [BX + SI], AL
ADD [BX + SI], AL
...
screen source reset aux vars debug stack flags

Flowchart:


boardmix
START
INITAILIZE AX=00H
BX= NUMBER
AX=AX*BX
BX=BX-1
NO
IS BX=0?
YES
STOP
boardmix

Conclusion:

1. Explain shift instructions.
2. Explain rotate instructions.

1)The 8086 can perform two types of Shift operations; the logical shift and the arithmetic shift. There are four shift operations (SHL, SAL, SHR, and SAR).

2)The 8086 can perform two types of rotate operations; the rotate without carry and the rotate through carry. There are four rotate operations (ROL, ROR, RCL, and RCR). ROL shifts each bit of a register to the left. The highest bit is copied into both the Carry flag and into the lowest bit of the register