11/01/2022

8086 programs

① 8-bit Addition

```
ASSUME CS:CODE DS:DATA
DATA SEGMENT.
        DATA1 DB 24H
        DATA2 DB 12H
DATA ENDS
CODE SEGMENT
 BEGIN: MOV AX, DATA
        MOV DS, AX
        MOV AL, DATA1
        MOV BL, DATA2
        ADD AL, BL
        HLT.
  CODE ENDS
       END BEGIN
```

① Open DOSBOX

② mount c C:\8086

③ C:\

④ C:\> edit filename.asm
(blue screen window will open, write program, save, exit)

⑤ C:\> masm filename.asm

⑥ C:\> link filename.obj

⑦ C:\> debug filename.exe ↵
-t

② 16-bit Addition

```
ASSUME CS: CODE  DS: DATA
DATA SEGMENT.
      D1  DW  2442H
      D2  DW  3423H
DATA ENDS
CODE SEGMENT.
 BEGIN: MOV AX, DATA
        MOV DS, AX
        MOV AX, D1
        MOV BX, D2
        ADD AX, BX
        HLT
 CODE ENDS
      END BEGIN
```

③ 8-bit Multiplication

After MUL
16-bit product
will be in
AX register

```
ASSUME CS: CODE  DS: DATA
DATA SEGMENT.
      D1  DB  04H
      D2  DB  02H
DATA ENDS
CODE SEGMENT
 BEGIN: MOV AX, DATA
        MOV DS, AX
        MOV AL, D1
        MOV BL, D2
        MUL BL
        HLT
 CODE ENDS
      END BEGIN
```

(4) 16-bit Multiplication

```
ASSUME CS: CODE  DS: DATA
DATA SEGMENT.
        DATA1  DW  1111H
        DATA2  DW  FFFFH
        RESULT1 DW 0000H
        RESULT2 DW 0000H
DATA ENDS
CODE SEGMENT
BEGIN: MOV AX, DATA
       MOV DS, AX
       MOV AX, DATA1
       MOV BX, DATA2
       MUL BX
       MOV RESULT1, DX
       MOV RESULT2, AX
       HLT
DATA ENDS
       END BEGIN
```

After MUL 32-bit Product will be generated

DX: higher order 16-bit

AX: lower order 16-bit

} will store result in the memory.

To view memory location :-

-d 0000 ↵

In debug option of masm after hyper

-d address of memory

↳ by default data segment logical address starts from 0000H.

(5) 16-bit Division

```
ASSUME CS: CODE DS: DATA
DATA SEGMENT
     D1 DW 24FEH
     D2 DW 0010H
DATA ENDS
CODE SEGMENT.
BEGIN: MOV AX, DATA
       MOV DS, AX
       MOV AX, D1
       DIV D2
       HLT
CODE ENDS
     END BEGIN
```

→ Numerator (16 bit) is moved into AX register

→ Denominator (16 bit) is given as operand of DIV

→ After DIV instruction

AX → Quotient (24FH)

DX → Remainder (EH)

HW → To find the largest number from a string of bytes.

* assume the length of string is 8