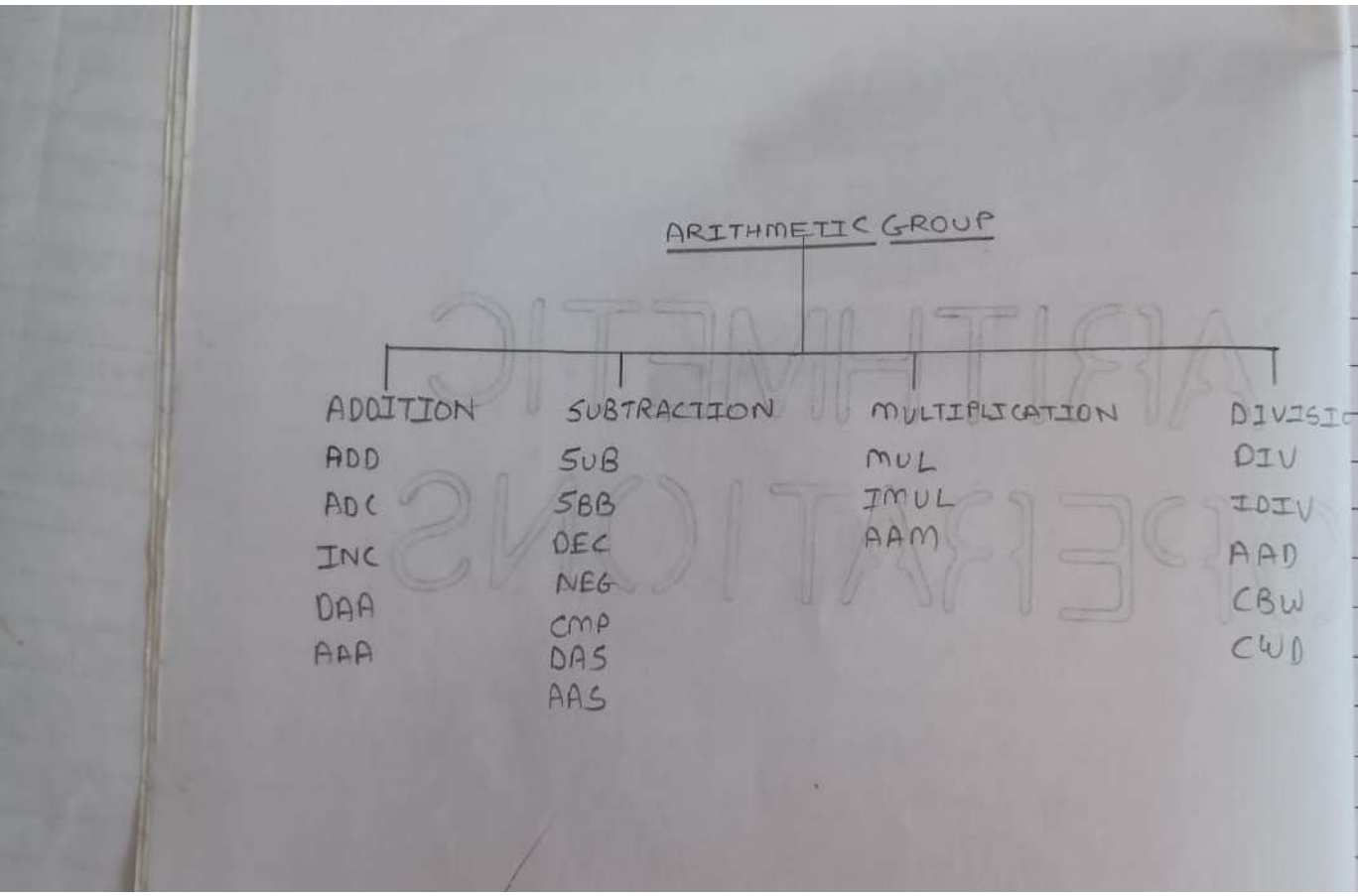

AIM: To p

THEORY:
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1. Addition
ADD - Add
this inst
result to

Program

Algorithm
Step 1: I
Step 2: G
Step 3: G

Roll NO.: B049
Date : 10/7/2024

Experiment 1

Aim:
To perform arithmetic operations on 8 bit data.

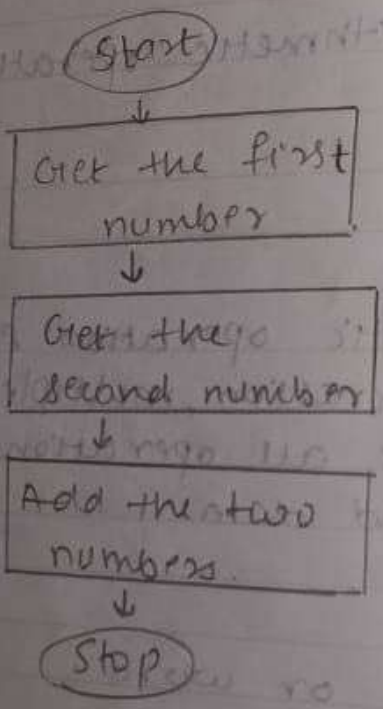
Theory:
Under arithmetic operation 8086, provides addition, subtraction, multiplication and division where all operations are performed on the operand data.

(1) Addition
ADD- Add byte or word
This instruction adds a number from source and put the result to specific destination.

Program: WAP for addition of two 8bits numbers

Algorithm
Step 1: Initialize the data segment
Step 2: Get the first number in AL register
Step 3: Get the second number in BL register
Step 4: Add two numbers
Step 5: Stop

Flowchart



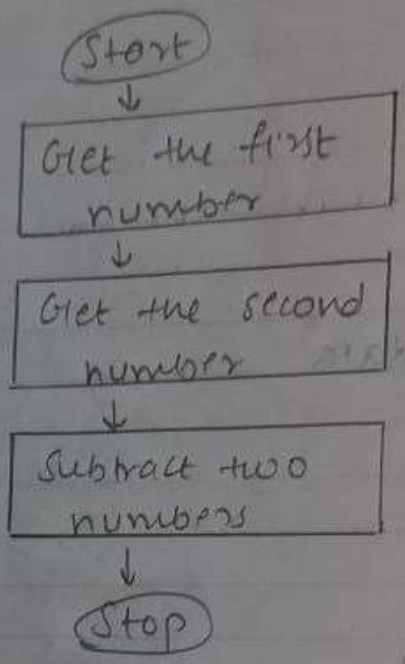
Output.

```
C:\> tasm filename.asm
C:\> tlink filename.obj
C:\> filename
04
```

Program:

```
.model small
.data
a db 02H
b db 02H
.code
mov ax, @data
mov ds, ax
mov al, a
mov bl, b
add al, bl
mov ch, 02H
mov cl, 04H
mov bh, al
12: rol bh, cl
    mov dl, bh
    and dl, 0FH
    cmp dl, 09
    jbe 14          ; 0-9  Add 30
    add dl, 07H     ; A-F  Add 37
14: add dl, 30H
    mov ah, 02H     ; To display
    int 21H
    dec ch
    jnz 12
    mov ah, 4CH     ; To terminate
    int 21H
    end
```

Flow chart



Output

```
C:\>tasm filename.asm
C:\>tlink filename.obj
C:\>filename
06
```

(2) Subtraction

Sub: SUB byte or word

This instruction subtracts a number from source to number from destination and puts the result to specific destination.

Program 1: WAP for subtraction of two 8 bits number

Algorithm

Step 1: Initialize the data segment
Step 2: Get the first number in AL register
Step 3: Get the second number in BL register
Step 4: Subtract the two numbers
Step 5: Display result
Step 6: Stop

Program

```
.model small
.data
a  db  08H
b  db  02H
.code
   Mov  ax, @data
   mov  ds, ax
   mov  ax, 0000H
   Mov  al, a
   mov  bL, b
   Sub. al, bL
```

```
mov ch, 02H
mov cl, 04H
mov bh, al
J2: rol bh, cl
   mov dl, bh
   add dl, 0FH
   cmp dl, 09H
   jbe J4
   add dl, 07H
J4: add dl, 30H
   int 21H
   dec ch
   jnz J2
   mov ah, 4CH
   int 21 H
   end
```

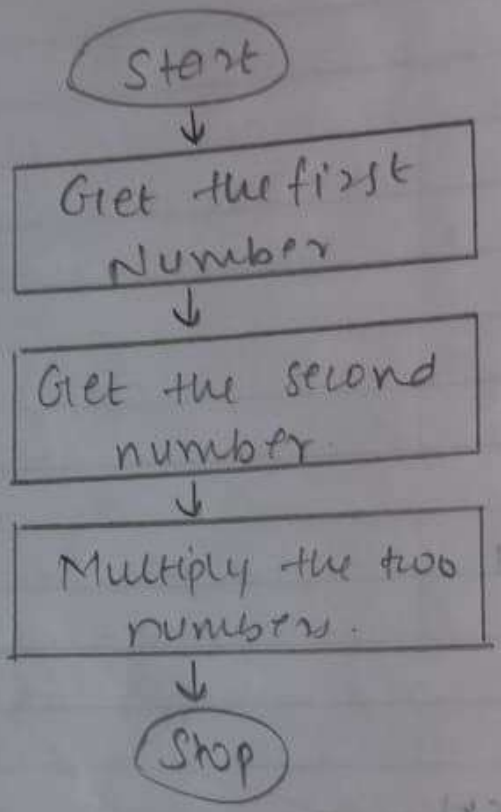
(3) Multiplication

This instruction multiplies an unsigned byte from source with a byte in the AL register as an unsigned word from source with an unsigned word in ax.

When a byte is multiplied by contents of al, result is stored in ax.

The MSB of result is stored in AH register and the LSB of the result is stored in AL register.

Flow chart



Output

```
C:\> tasm filename.asm
C:\> tlink filename.obj
C:\> filename
 04
```

Program 1: WAP for multiplication of two 8 bits number

Algorithm
Step 1: Initialize the data segment
Step 2: Store first number in BL register
Step 3: Store the second number in AL register
Step 4: Multiply two numbers
Step 5: Display result
Step 6: Stop

Program

```
.model small
.data
a db 02H
b db 02H
.code
 mov ax, @data
 mov ds, ax
 mov ax, 0000H
 Mov al, a
 mov bl, b
 mul bl
 mov ch, 02H
 mov cl, 04H
 mov bh, al
12: rol bh, cl
 mov dl, bh
```

```
and dl, 0FH
cmp dl, 09
jbe I4
add dl, 07H
I4: add dl, 30H
mov ah, 02H
int 21H
jnz I2
mov ah, 4CH
int 21H
end
```

(4) Division

This instruction divides an unsigned byte from source with an unsigned byte AL register or an unsigned word from source with an unsigned word in AX.

When a byte is divided the result is stored in AX.

Program 1: WAP for division of two 8 bit numbers.

Algorithm

Step 1: Initialize the data segment

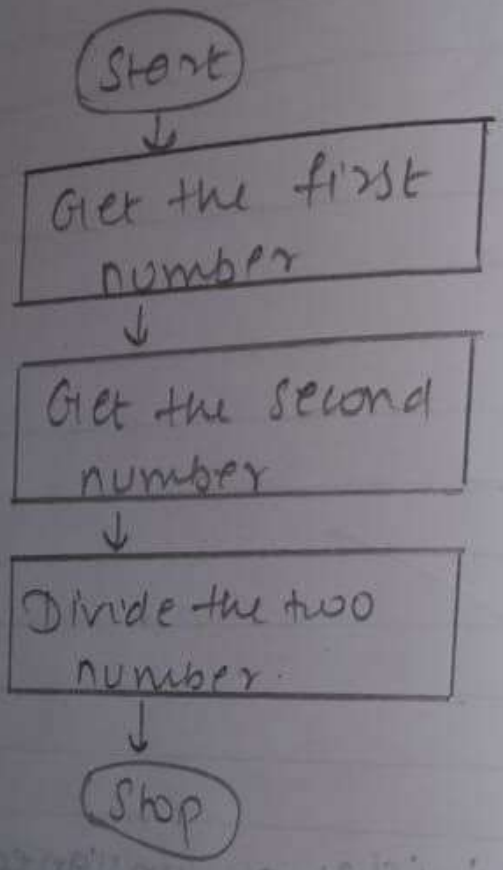
Step 2: Store first number in AL register

Step 3: Store second number in BL register

Step 4: Divide the two numbers.

Step 5: Display result.; Step 6: Stop.

Flowchart



Output:

```
C:\> tasm filename.asm
C:\> form filename.obj
C:\> filename
 04
```

Program

```
.model small
.data
a  db  08H
b  db  02H
.code
   mov ax, @data
   mov ds, ax
   mov ax, 0000H
   mov dl, a
   mov bl, b
   div bl
   mov ch, 02H
   mov cl, 04H
   mov bh, al
I2: rol bh, cl
   mov dl, bh
   and dl, 0FH
   cmp dl, 09
   jbe I4
   add dl, 07H
I4: add dl, 30H
   mov ah, 02H
   int 21H
   dec ch
   jnz I2
   mov ah, 4CH
   int 21H
   end
```