

**SSN College of Engineering**  
**Department of Computer Science and Engineering**  
**III yearA section - UCS1512 – Microprocessors Lab**

Academic Year: 2022-2023  
Semester: V

Batch: 2020-2024

**Experiment No 1: 8-bit Arithmetic Operations**

**1 a) 8 bit addition**

; Program for adding 2, 8 bit numbers

```
assume cs:code,ds:data
data segment
    opr1 db 11h
    opr2 db 99h
    result db 00H
    carry db 00H
data ends
code segment
    org 0100h
start:  mov ax,data
        mov ds,ax
        mov ah,opr1
        mov bh,opr2
        mov ch,00h
        add ah,bh
        jnc here
        incch
here:   mov result,ah
        mov carry,ch
        mov ah,4ch
        int 21h
        code ends
end start
```

**1 b) 8 bitsubtraction**

Hints to write the program

**Input** : two 8 bit values

**Output**: difference in one memory location, indication of sign in another location

(eg: FF-FE = 01, indication of sign is 00 i.e. positive

FE – FF = 01, indication of sign is 01 i.e. negative)

**Main instructions that can be used:**

**sub ah,bh** ; ah=ah-bh, carry will be generated if ah < bh.

**neg ah** ; ah = 2's complement(ah).

## 1 c) 8 bit multiplication

**Input** : two 8 bit values

**Output**: product in 16 bits

Main instructions that can be used:

**mul bl** ; AX = AL x BL, AL is the default operand register for this instruction for one operand.

## 1 d) 8 bit division

**Input** : two 8 bit values

**Output**: quotient in one location, remainder in another location

**Main instructions that can be used:**

**div bl** ; it will perform AX / BL , after execution , quotient will be stored in AL, remainder will be stored in AH

**Hints:**

No dedicated instruction available in 8086 to perform 8 bit / 8 bit;

So the above instruction can be used, but ensure that AH is loaded with 00 before execution.