SSN College of Engineering
Department of Computer Science and Engineering
III year A section - UCS1512 – Microprocessors Lab

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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
        inc ch
here:   mov result,ah
        mov carry,ch
        mov ah,4ch
        int 21h
        code ends
end start
```

1 b) 8 bit subtraction

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, reminder in another location

Main instructions that can be used:

div bl ; it will perform AX / BL , after execution , quotient will be stored in AL, reminder 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.