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

Academic Year: 2020-2021 Batch: 2018-2022

Semester: V

Experiment No 1: 8-bit Arithmetic Operations

1 a) 8 bit addition

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; 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
```

1 b) 8 bit subtraction

Hints to write the program

code ends

end start

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).</pre>

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:

 $\label{eq:continuous} \textbf{div bl} \text{ ; it will perform AX / BL , after execution , quotient will be stored in AL, reminder will be stored in AH}$

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.