National University of Computer and Emerging Sciences

Laboratory Manual

for

Computer Organization and Assembly Language Programming

(EL 213)

Course Instructor	Ms. Sana Fatima
Lab Instructor(s)	Mr. Hazoor Ahmad Mr. Muhammad Salman Mubarik
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Department of Computer Science

FAST-NU, Lahore, Pakistan

Exercise 1: [Extended Subtraction] Write a program for subtracting 64 bits given below.

Initially				
num1:	**1000 1000 0000 0000**	**0110 0000 1111 1111**	**0100 0000 0000 0000**	**1111 1111 1111 1111**
num2:	**1000 1111 0000 1111**	**0000 0000 0000 0000**	**0100 0000 0000 0001**	**1000 0000 0000 0000**
result:	**0000 0000 0000 0000**	**0000 0000 0000 0000**	**0000 0000 0000 0000**	**0000 0000 0000 0000**

Exercise 2: [Extended Multiplication] Write a program to multiply two 32-bit numbers and store the answer in a 64-bit location.

Sample Run:

a: **dq 0xABCDD4E1** ; **dq** allocates 64-bit memory space. a is 32-bit number but it has space allocation of 64 bits

b: **dd 0xAB5C32** ; 32-bit space for multiplier

result: dq 0x0 ; result should be 0x73005CB8FF6FF2 verify on calculator programmer's view

Exercise 3: Fill the following table. These instructions are from same program and are not independent. Write the corresponding output for the given registers' and flags' values.
AX=0x5CAA DX=0x3729 CX=0x235A

Instructions	Updated value after executing the instruction			Flag values after the instruction execution		
	AL	DL	CL	CF	OF	SF
xor al, dl						
add dl, dl						
sub cl, dl						
sar al, cl						
adc al, dl						