# Lab #7 – Design of an Adder/Subtractor unit

**<u>Objective</u>**: In this lab we will design an arithmetic circuit that will perform both addition and subtraction.

Using 74LS86 (XOR), 74LS83A (4-bit adder) and other TTL gates, design a 4-bit adder/subtractor circuit and demonstrate its functionality. The circuit receives two 4-bit numbers (A and B) and a control signal SUB. When SUB = 0, addition A+B is performed, and when SUB = 1, subtraction A-B is performed.  Use 2's complement algorithm to do subtraction. Your design should include Carry, Sign, Overflow, and Zero flags. Use LED's to display the output and flags.

In preparation for this lab, each student should draw a complete logic schematic for the circuit he/she intends to construct.

Implement your circuit first in electronic workbench and verify its operation. Once satisfied, construct it on your breadboard. Upon completion, have TA or instructor verify the design and sign both the lab cover page and your notebook.