# Dhaka University of Engineering & Technology, Gazipur

Department of Computer Science and Engineering (CSE)

**Course Title:** Microprocessor and Interfacing Sessional (CSE 3812)

**Lab # 01**

*Program Structure and Arithmetic Operations using Assembly Language Program in EMU8086.*

# Objective:

Getting familiar with Program Structure and Arithmetic operations using Assembly Language Program in EMU8086.

# Theory:

* **Data Transfer Instructions:**

**Registers (Direct):** Move contents of BX register to AX register MOV AX, BX

**Direct:** Move contents of the variable labeled COUNT to AX register MOV AX, COUNT

**Immediate:** Load CX register with the value 240d MOV CX, 00F0H

MOV CX, 240d

**Memory:** Load CX register with the value at address 240 MOV CX, [0F0H]

**Registers (Indirect):** Move contents of AL register to memory location in BX MOV [BX], AL

# Arithmetic / Logic Instructions:

Arithmetic and logic instructions can be performed on 8-bit (byte) and 16-bit values. The first operand has to be a register and the result is stored in that register.

**Increment** the contents of BX register by 4 ADD BX, 4

**Add** the contents of AX register with the contents of CX register ADD AX, CX

**Subtract** 1 from the contents of AL register SUB AL, 1

**Subtract** the contents of CX register from the contents of DX register SUB DX, CX

**Multiply** AL by BL, the result will be in AX MUL BL

**Divide** the contents of AX register with the value of CL and store the result in AX DIV CL

**Increase** or decrease the contents of BX register by 1 INC BX ; Increase

DEC BX ; Decrease

**Compare** (subtract and set flags of flag register but without storing result) CMP AX, 0054H

**Clear** the contents of AX register XOR AX, AX

**Negation** of a register value NEG AX

# Assembly Language Program Skeleton:

ORG 0100h

.DATA ; Data Segment Starts A DW 11

B DW 4 SUM DW ?

DIFFERENCE DW ? MULTIPLICATION DW ? DIVISION DW ?

.CODE ; Code Segment Starts MAIN PROC ; Initialize Data Segment

MOV AX, @DATA MOV DS, AX

…

…

MAIN ENDP ; End Procedure END MAIN ; End MAIN

RET ; Return to DOS

# Tasks to do:

* 1. Write an appropriate assembly language code to accomplish the following tasks (use as many as possible arithmetic instructions with less number of registers):
     1. Convert 260o C (Celsius) to F (Fahrenheit) using the following expression and store in a variable F:

°F = °C x 9/5 + 32 - 1

* + 1. Convert 1000 oF (Fahrenheit) to oC (Celsius) using the following expression and store in a variable C:

°C = (°F - 32) x 5/9 + 1