Assignment 3 (Total marks 20):

Date of posting: 8th Oct, 2018;

Last date of submission: 22nd Oct ; Last date for Demo : 24th Oct

Implement the following problems in SML

1. (4) SML function for the following.

   - (mark 2) recursive function **sum : int * int --> int**, where sum(m, n) = m + (m+1) + ...(m +(n-1)) + (m + n). Raise exception if m > n and handle it appropriately

   - (mark 2) function **bin_coeff : int * int --> int** to compute binomial coefficient.

2. (2) SML functions in both the following cases to test whether time t1 comes before time t2. The time **t** is represented as

   - (mark 1) triple (hour, min, f), where f is either AM or PM e.g., t = (11, 45, "AM")

   - (mark 1) record {hour = 11, min = 45, f = "AM"}

3. (6) Polynomial can be represented as list of pairs (coeff, exp). Write SML functions for adding and multiplying two polynomials.

4. (8) SML functions for manipulating complex numbers in structure. Declare and define the following infix operators.

   - ++ (Complex addition) e.g., (a, b) ++ (c, d) = (a + c, b + d)

   - ** (Multiplication) e.g., (a, b) ** (c, d) = (a*c - b*d, b*c + a*d)

   - Multiplicative inverse e.g., 1 / (a, b) = (a / (a * a + b * b), -b / (a * a + b * b))

   - Complex division using multiplicative inverse function