**CS-224: Object Oriented Programming & Design Methodologies**

**Midterm Exam I– B- Fall 2017**

**Instructor: Ms. Asma Sanam Larik**

**Dated:** 20th Sept 2017 **Time:** 70 mins

**Q1.** A polynomial is represented by two attributes; one is the degree and second is the coefficient. Thus 5x2+2x+3 is degree two and its coefficients are coeff[0]=3, coeff[1]=2 and coeff[2]=5. Design a class **Polynomial** to represent single-variable polynomials which contain the following functionality:

1. A zero argument constructor that initializes the degree and coefficients to zero
2. A two argument constructor that initializes both the degree and the coefficients array
3. A method “negate” that returns negative of the polynomial. (Note: Just multiply all the coefficients with -1)
4. A method “add” that takes two polynomials as input and computes their sum (Note: a new polynomial should be created and returned; the original should not be changed. Also only same degree coefficients are added)
5. Implement the method **main** that demonstrates all the above mentioned functionalities

**Q2.** Diving competitions are scored as follows:

* Each competitor is given a mark out of 10 for a dive by each of five judges.
* The score for a dive is calculated by discarding the highest and lowest mark, determining the average, and then multiplying it by a difficulty factor (a number in the range 0.1 to 1.0 in increments of 0.1)

All competitors complete three dives. Their overall score is the sum of the marks for each dive. The winner is the competitor with the highest score. You are required to write C++ code to automate this scoring process.

**Q3.** Write a function named **shift\_right** that takes as its arguments the following:

(1) an array of floating point values

(2) an integer, call it "left", that tells the leftmost cell of the part of the array to be shifted

(3) an integer, call it "right", that tells the rightmost cell of the part of the array to be shifted

(4) a positive integer, call it "distance" that tells how many cells to shift by.

The function should make sure that left is less than or equal to right, and that distance is greater than zero. It should shift by distance cells the contents of the array cells with subscripts running from left to right .

----------------------------------------------- Good Luck ☺------------------------------------------------------