ELEC 2543 Object-Oriented Programming and Data Structures

Exercise 10

Topics: Recursions

Due Date: Apr 20, 2017

**Pascal’s Triangle**

Pascal’s triangle tells the binomial coefficients of different binomial powers. Please refer to the wiki page for an illustrative animation. The first five rows are shown below:

1st row: 1

2nd row: 1 1

3rd row: 1 2 1

4th row: 1 3 3 1

5th row: 1 4 6 4 1

Use recursion to compute the *k*th row in the Pascal’s Triangle. The driver program PascalTriangle.java has been provided. Implement method public static int[] computePT(int k). The returned array should contain the numbers on the *k*th row. (Hint: Row *k*+1 can be developed from Row *k*).

No credit is given if method computePT is not a recursive method. You cannot define other methods.

**Binary Search**

Binary Search is a technique to quickly search an item in a sorted array. Given an array of size *n*, binary search can locate an item in *O(log n)* time. Please refer to the notes posted to understand how binary search works.

Implement method binSearch in class BinarySearch using recursion. You can assume parameter Comparable[] list is always sorted in ascending order. The driver program BinarySearchDemo is provided to test your program.

Handin

Submit your PascalTriangle.java and BinarySearch.java as separate files to Moodle before the deadline.