**Assignment #6 (10 points)**

**Note: You may use either Java or C++ for implementation.**

1. Write a generic ADT Matrix which defines an n x m matrix of type T. In addition to constructors (if needed), create a method named find\_max within ADT that finds the first occurrence of the “largest” element in a matrix. For example, in the following 3x4 matrix of integers [[1,2,4,4],[5,5,4,2],[3,1,1,5]], the first occurrence of the largest element is 5 at position/indices (1,0). In the following 5x2 matrix of strings [[“David”, “Kelin”, “Peter”, “Zag”, “Diana”], [“Elin”, “Adam”, “Young”, “Peter”, “Zag”]], the first occurrence of the largest element is “Zag” at position/indices (0,3). Write a main method that creates the above two matrices, and calls the find\_max method to find the first occurrence of the largest element as well as the corresponding indices.
2. Write a parent class Rectangle with an area calculation method and a circumference calculation method. Write a child class Square with an area calculation method that overrides the Rectangle class’s area method. Use dynamic binding for the area method and static binding for the circumference method (note: in C++ use ***virtual*** for dynamic binding, in Java use ***final*** for static binding.) Write a main program that calls both the dynamically bound method and the statically bound method a large number of times (say 1000 times), timing the calls to static binding method as well as to the dynamic binding one separately. Compare the results and explain the difference.