

Week-13 Lab

- 1) Write the linear search function to use a generic type for array elements. Test the function with array of **int**, **double**, and **char** values.
- 2) Design a class named **Triangle** that extends **GeometricObject**. The class contains the following:
 - Three **double** data fields named **side1**, **side2**, and **side3** to denote three sides of triangle
 - A no-arg constructor that creates a default triangle with each side **1.0**.
 - A constructor that creates a rectangle with the specified **side1**, **side2**, and **side3**.
 - The constant accessor functions for all three data fields.
 - A constant function named **getArea()** that returns the area of this triangle.
 - A constant function name **getPerimeter()** that returns the perimeter of this triangle.

Implement the class. Write a test program that prompts the user to enter three sides of the triangle, enter a color, and enter 1 or 0 to indicate whether the triangle is filled. The program should create a **Triangle** object with these sides and set the color and filled properties using the input. The program should display the area, perimeter, color and true or false to indicate whether filled or not.

- 3) Design a class named **Person** and its two derived classes named **Student** and **Employee**. Make **Faculty** and **Staff** derived classes of **Employee**. A person has a name, address, phone number, and email address. A student has a class status (Freshman, sophomore, junior, or senior). An employee has an office, salary, and date hired. Define a class named **MyDate** that contains the fields **year**, **month**, and **day**. A faculty member has office and a rank. A staff member has a title. Define a constant virtual **toString()** function in the **Person** class and override it in each class to display the class name and person's name.

Implement the classes. Write a test program that creates a **Person**, **Student**, **Employee**, **Faculty**, and **Staff**, and invokes their **toString()** functions.