

**WIA1002/WIB1002 Data Structure****Tutorial: Generics**

1. Create a generic class called Container that accepts one parameter, T. Create a no-arg constructor. Declare a private variable, t of type T. Create a method, add that returns nothing, accepting a parameter of generic type. Initialize this parameter to the initially declared variable. Create a generic method called retrieve() that returns the initially declared variable.

Create a main method within the Container class. Create two containers of type Integer and String. Append two objects to the containers, one of type Integer having value 50, another of type String having value Java. Display the Integer and String objects from the respective containers.

2. Create a class called MyArray that has two methods, a main method that creates 3 arrays of
  - a) integer containing the numbers 1,2,3,4 and 5
  - b) string containing names, Jane, Tom and Bob
  - c) character containing alphabet, a, b and c

and a generic method listAll that displays the list of arrays.

3. What is a raw type? Why is a raw type unsafe? Why is the raw type allowed in Java?
4. What is erasure? Why are Java generics implements using erasure?
5. Create a generic class named Duo that has two parameters, A and B. Declare a variable named first of type A, and the second variable named second of type B. Create a constructor that accepts these two parameters. In the constructor, assign these parameters respectively to the declared variables.
6. Use the Duo class in Question 4 to declare and create two objects as follows :
  - a. First object called sideShape consist of respectively String type and Integer type.
  - b. Second object called points consists of two Double types.

7. Assume that the following objects were created

```
ArrayList<String> vehicle = new ArrayList<>();  
ArrayList<Object> transportation = new ArrayList<>();
```

Declare a method header for generic method, allTransportation that returns nothing, which accepts two ArrayList parameters using the wildcards.

8. Assuming that two new object are created as follows

```
ArrayList<Integer> numOfCars = new ArrayList<>();  
ArrayList<Double> milesPerHour = new ArrayList<>();
```

Using the <?> wildcard, implement a generic method that displays the list.

9. When the compiler encounters a generic class, interface, or method with an unbound type parameter, such as <T> or <E>, it replaces all occurrences of the type parameter with what type?
10. When the compiler encounters a generic class, interface, or method with a bound type parameter, such as <T extends Number> or <E extends Comparable>, it replaces all occurrences of the type parameter with what type?