CSE218 HW 4 Generics

1. Using an **array (**not **ArrayList)** as its underlying data structure, rewrite the **StackX** class we wrote in class to make it a generic class called **GStack**. The generic class should work with any types of objects.

2. Add a generic method called pushAll to the above generic stack class. The method must allow the user to pus an array of objects to the stack, one at a time. It must avoid any runtime errors.

3. Add a generic method called popAll to the above generic stack class. The method must allow the user to remove the entire stack content in sequence and return an array containing the removed objects.

4. Write a generic bag class called **NumberBag** that can be used to store any types of **Number** objects. The generic bag class must allow the user to insert, remove, find, and display the numbers.

5. Write a generic bag class called **GBag** using an array to store any objects. Test the class with a **Demo** class to store, find, delete, and display integers, and String, respectively. When you write the find method, make sure you use functional programming with the use of a **Predicate** parameter

6. Write another class called **Student**, which contains name (String), id (String), and gpa (double) fields. Use the above generic **GBag** class from the previous problem to store five students with automatically generated id numbers. In the Demo program, you will then find, delete, and display any student by id number, by name, or by gpa.

7. Add an **automatic** backup and restore feature to the User Sign-In and Sign-Up program assigned last week.