Exercise - Generic Programming (write a generic class and a generic method)

1. Write a generic class named Maximizer that can be used to calculate the maximum of a set of values. As shown in the code below, you should be able to:
    a. Instantiate a Maximizer for any data type that implements the Comparable interface (String, Integer, etc.)
        i. Comparable is an interface built into Java that a class can implement to make its objects "sortable" (see the Java documentation for details)
        ii. Many built-in Java classes such as String and Integer implement the Comparable interface
    b. Pass the Maximizer a set of values one-by-one by calling its `updateValue` method
    c. Call the Maximizer's `getValue` method to retrieve the maximum value that was passed to its `updateValue` method
    d. Here's some sample code that shows how the Maximizer class is used:

```
Maximizer<String> strMaximizer = new Maximizer<>
();

strMaximizer.updateValue("a");

strMaximizer.updateValue("z");

strMaximizer.updateValue("m");

String maxStr = strMaximizer.getValue();

System.out.println(maxStr);


Maximizer<Integer> intMaximizer = new Maximizer<>
();

intMaximizer.updateValue(-22);

intMaximizer.updateValue(10000);

intMaximizer.updateValue(33);

Integer maxInt = intMaximizer.getValue();

System.out.println(maxInt);
```

    e. Using the code above, write a short program that demonstrates that your Maximizer class works

2. Write a class named Algorithms that has one static, generic method named "calcStats" that can calculate the minimum and maximum values in an array of any data type that implements the Comparable interface. "calcStats" should return a "Stats" object containing the min and max values.
    a. Here's some sample code that shows how to call "calcStats":

```
String[] strArr = new String[] { "z", "a", "m" };

Stats<String> strStats = Algorithms.calcStats(strArr);

System.out.println(String.format("min: %s, max: %s",
```

```
            strStats.min, strStats.max));


        Integer[] intArr = new Integer[] { 10000, 33, -22 };
        Stats<Integer> intStats =
Algorithms.calcStats(intArr);
        System.out.println(String.format("min: %d, max: %d",
            intStats.min, intStats.max));
```

b. Using the code above, write a short program that demonstrates that your "calcStats" method works

3. Zip up your code and submit it on Canvas