CSC 230: Elementary Data Structures and Algorithms

Fall 2022

Assignment 08

- General programming guidelines:
  - Create a separate NetBeans project with the name `QuestionXX`, where `XX` is the question number.
  - Do not forget necessary javadoc comments before classes and methods.
  - You should use *single line* or *multiline* comments, **if it is required**. Do not put unnecessary comments (Do not state the obvious!!!).
  - Use meaningful identifier.
  - Don't forget to check the parameters of your methods and throw appropriate exceptions as necessary.
  - **Creating correct NetBeans projects, zipping your final assignment folder, and testing it before uploading are your responsibilities. If any of these steps fails, you will receive a grade of zero.**
- Academic integrity policy
  - You are **not** allowed to use any online resources EXCEPT Revel, class lecture notes and Java documentation.
  - All programs/ code must be your own work.
  - You should be able to clearly explain every line of your code, if instructor requests you to do so.
  - Any violation of these policies will be considered as plagiarism and dealt accordingly.

Note/ Hint: Write each sorting algorithm for a primitive integer array. After you make sure it works, introduce type parameters. You must test your algorithms using an array of `Integer`s and an array of `Circle`s. The defined `Circle` should be comparable based on the radius of the circle.

```
Integer[] a1 = {10, 5, 56, 67, 4, 59, 13};
Circle[] a2 = {new Circle(20), new Circle(3), new Circle(15), new Circle(45),
new Circle(20), new Circle(10)};
```

You should print the content of the above arrays *before* and *after* sorting.

Question 1 (25 points): Write Java code for bubble sort algorithm (pick the good one out of the two algorithms we learned in the class).

Question 2 (25 points): Write Java code for selection sort algorithm.

Question 3 (25 points): Write Java code for insertion sort algorithm.

Question 4 (25 points): Write Java code for quick sort algorithm. Pick the pivot randomly.