A05 Kd-Trees - Part1

MISSING 30 Possible Points

| 10/31/2022

Attempt 1

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Assignment: Kd-Trees - Part 1

Learning Objectives

- Use Java generics and create generic classes.
- Implement two versions of the same API and analyze the performance of the different versions.

Overview

This assignment should be completed with a partner.

In this assignment, you will create two implementations of a symbol table data type whose keys are two-dimensional points. One of them is a brute-force implementation, the other uses a 2d-tree that supports efficient *range search* and *nearest neighbor search*.

To help teams pace themselves, the assignment is broken up into two parts. In this first part of the assignment, you are asked to implement one out of two classes.

Instruction

Find a partner unless you got one assigned already. Ideally, you would have a different partner for each of the team assignments.

Assignment Instructions:

The instructions are based on an assignment of Princeton's algorithm course.
http://www.cs.princeton.edu/courses/archive/fall14/cos226/assignments/kdtree.html (http://www.cs.princeton.edu/courses/archive/fall14/cos226/assignments/kdtree.html)

This first part of the assignment requires the implementation of the class **PointST<Value>**. It should be created in a **package called a05**.

In order to earn full points, they need to pass most of the JUnit tests on CodePost (see rubric). You can submit as often as you like but only up until the deadline.
Before you submit via Canvas, take a screen-shot of the CodePost website that shows your bruinmail, the class that is tested, and the number of passing/failing tests.

Heads-Up: Class KdTreeST is difficult to debug. If you want an early start on part 2, begin with the worksheet - ideally together with your partner. Then write some pseudo-code.

Additional Resources:

This time, there are multiple videos.They can be a great help in clarifying how KD trees work, in pointing out areas that need special attention, and in showing a way how to prepare before starting to code. Most of the information in the resources is directly applicable to the instructions, but not

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http://www.cs.princeton.edu/courses/archive/fall14/cos226/checklist/kdtree.html (http://www.cs.princeton.edu/courses/archive/fall14/cos226/checklist/kdtree.html)

Video:

https://www.youtube.com/watch?v=iRfNvfJszlE&feature=youtu.be (https://www.youtube.com/watch?v=iRfNvfJszlE&feature=youtu.be)

(https://www.youtube.com/watch?v=iRfNvfJszlE&feature=youtu.be)

Help: walk-through of the worksheet

https://www.youtube.com/watch?v=c_KluD_mvEU&feature=youtu.be (https://www.youtube.com/watch?v=c_KluD_mvEU&feature=youtu.be)

(https://www.youtube.com/watch?v=c_KluD_mvEU&feature=youtu.be)

Coding Tips:

https://www.youtube.com/watch?v=bkG6ECT0W3o&feature=youtu.be (https://www.youtube.com/watch?v=bkG6ECT0W3o&feature=youtu.be)

(https://www.youtube.com/watch?v=bkG6ECT0W3o&feature=youtu.be)

Submission

One team member embeds the screenshot from CodePost that shows your bruinmail, the assignment, and the number of passing tests. (Links to an external site.)

Both team members submit the name of the partner and the discussed pebble distribution. If the pebble distribution is not 50/50, include a description that explains the difference.

View Rubric

A05 Part 1 Rubric								
Criteria	**Ratings**							**Pts**
JUnit tests for class PointST view longer description	**30 to >26 pts** **Full Marks** No more than 1 test fails	**26 to >22 pts** **2 Tests fail**	**22 to >18 pts** **3 tests fail**	**18 to >14 pts** **4 tests fail**	**14 to >10 pts** **5 tests fail**	**10 to >6 pts** **6 tests fail**	**6 to >0 pts** **7 or more tests fail**	**0 pts** **Insufficient** No submission or no evidence of passed tests.	/ 30 pts
								Total Points: 0

Keep in mind, this submission will count for everyone in your Project Groups group.

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