Homework 8 - MM

Problem 1. (75 points) Implement three GC algorithms in Java. A project skeleton is provided at `https://github.com/nosrepus/gccp`. You can download the skeleton from GitHub. You can ONLY modify the following three classes in package `gc`:

(a) `RefCountHeap` (for reference counting)

(b) `MarkSweepHeap` (for mark and sweep)

(c) `CopyCollectHeap` (for copy collection)

You can add your own test programs to package `gc.test` in order to verify the correctness of your implementation. There are already several test programs in that package, and a correct implementation should at least pass all of the test cases executed in `gc.test.TestMain`.

This problem will be automatically judged by a computer program, so do not output anything to `System.out` in your implementation. You are required to submit a runnable JAR file[1] with Java source code files included. Your code should only use the classes in `java.lang.*` and `java.util.*`.

There will be more than 10 test programs. For each program, your implementation has 5 seconds to finish the execution. It is guaranteed that all the programs can finish the execution in limited time. Your implementation is executed in a sandbox, and can ONLY do computation. Any other actions including filesystem access and network access will result in a runtime error.

You need to put your JAR file in email attachment. Suppose your student ID is xxx, then the JAR file name should be xxx.jar.

Problem 2. (25 points) Can you think of a better Mark-n-Sweep algorithm that reduces the amount of waiting time when garbage collecting?

Remark: You just need to send your .pdf file to likaijian@sjtu.edu.cn. Email Subject line Format(also the pdf file name): HW_X_Name_StudentID

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[1]You can find JAVA installer and installation instruction from https://www.oracle.com/java/technologies/javase-downloads.html. Follow the installation instruction to install JAVA. Please install JAVA version 1.8 or higher. Recommended to choose 1.11. You can use an IDE (like IntelliJ IDEA) or just use an editor(like vscode) to work with JAVA. Please go online to search how to use them with JAVA. You also need to learn how to export JAR file. If you have any questions, you can contact TA