

The purpose of this assignment is to practice your knowledge of binary heaps. The assignment must be completed in pairs.

1. The Problem

We have been asked to construct a priority queue. A priority queue is a data structure that allows access and deletion of only the minimum item in a set, and insertion of an arbitrary item.

The priority queue is elegantly implemented with a binary min heap. The min heap is a complete binary tree and uses implicit representation (i.e., an array). The min-heap order property is such that any node is the smallest item in its subtree. There is no defined relationship between siblings - only between parent and children.

2. Requirements

PriorityQueue class

The PriorityQueue class has been started for you. PriorityQueue represents a priority queue of generically-typed items. The queue is implemented as a min-heap using an array. The following methods have been left for you to fill in.

- `public AnyType findMin()`
- `public AnyType deleteMin()`
- `public void add(AnyType x)`

Javadoc comments give descriptions of these incomplete methods (in addition to pseudocode comments within some of the methods).

The following are some notes to guide your implementation.

- Do not change the signature of any provided method or class. You may (and should) add helper methods, as needed.
- You will notice some type-safety warnings appear in Eclipse for the PriorityQueue class. These warnings are due to the use of a generically-typed basic array. You may safely ignore these warnings.
- The user may indicate that items are Comparable by using the default (i.e., no parameters) constructor, or the user may provide a functor for comparing items by using the constructor with the Comparator parameter. *Be sure to invoke compareTo or compare accordingly (there is already a helper method*

NAVIGATION

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Previous Semester

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CS_2100_S_13

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Participants

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Java review

Generic
programming;
Object Oriented
Programming

Algorithm
analysis; Data
Structures

Basic Sorting
Algorithms

Recursive Sorting
Algorithms

Linked Lists

Stacks and
Queues

to help you do this).

- This is not a doubly-ended priority queue. You do not need to implement a min-max heap - just a min-heap.
- You are strongly encouraged to use the provided method `public void generateDotFile(String filename)` and the DOT tool to visualize the binary heap during debugging.

Create your own tests and submit them with your program.

3. When preliminary coding is complete and your program compiles without error or warning, test the program thoroughly and systematically.

Your code should be well-commented (Javadoc comments are recommended) and formatted such that it is clear and easy to read. Be sure to put the names of both programming partners in the header comment of each file.

Zip your source code files (.java only) and **upload the zip file here by 5p on Thursday, April 4**. Please submit just one solution per pair.

4. [Analysis Document](#) (must be written and submitted by each programming partner) **due Thursday, April 4, at 5p**

Due date:	Thursday, 4 April 2013, 5:05 PM
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Submission feedback



Poonam Ekhelikar
Tuesday, 30 April 2013, 12:08 AM

Grade: 100.00 / 100.00

---- Scoring -----

add() tests passed: 10/10

add() points: 30/30

findMin() tests passed: 10/10

findMin() points: 10/10

Trees

Graphs

Spring Break!

Hash Tables

Binary Heaps

 Lab 8

 Lab files

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 Min-Max heaps
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 **Assignment
11**

 Assignment 11
files

 Analysis
Document

File Compression

Comprehensive
Project;
Multithreading

Wrap Up

Final Exam and
Review

29 April - 5 May

SETTINGS

Assignment administration
Submission

Course administration

deleteMin() tests passed: 10/10
deleteMin() points: 35/35

Subtotal: 75/75
Testing and style: 5/5
Analysis document: 20/20
Total: 100/100

TA Comments:

Submission

 AddAndDelete.pdf

 Analysis.pdf

 findMin.pdf

No further submissions are allowed.