Tutorial 3: Priority Queues

General Instructions

Please attempt these questions before attending your tutorial session. You do not need to submit your solutions beforehand.

Exercise 1 *Amortized Analysis*

Read the Chapters 3.2 and 3.3 in the book of Mehlhorn and Sanders.

1. Explain in your own words the general ideas and the approach of an amortized analysis.
2. Explain this type of analysis in detail for unbounded arrays.
3. Define a sequence of operations that answers exercise 3.9 from Melhorn.
4. Describe a data structure setup that answers exercise 3.14 from Melhorn. Hint: there is more than one answer to this (you can be creative!) but you need to answer in terms of precisely how the deletion and insertion functions behave.

Exercise 2 *More Priority Queues*

Read Chapter 6.2 in the book of Mehlhorn and Sanders.

1. Briefly explain the advantages conferred by using Fibonacci heaps over the simpler binary heap implementation of priority queues
2. Read the internet survey at:

   `http://www.leekillough.com/heaps/survey_results.html`

   The second most popular implementation structure for a priority queue is a linked-list. Why might this be so? What disadvantages would a linked-list priority queue compared to a binary heap in terms of each operation?