Bioinformatics Group
Prof. Dr. Rolf Backofen
Florian Eggenhofer
Michael Uhl
Rick Gelhausen

Algorithms and Data Structures
WS 2018 / 2019

http://www.bioinf.uni-freiburg.de/Lehre/

Exercise sheet 6

Deadline: Tuesday, 27.11.2018 12:00 AM

This week's lecture introduced the concept of priority queues. In this exercise sheet you will implement a priority queue by yourself. The implemented priority queue will also be needed later on for the exercise sheet on Dijkstra's algorithm.

Exercise 1 PriorityQueue (20 points)
Implement the class *PriorityQueueMinHeap* with the following methods (as described in the lecture):

- *insert* (6 points)
- *get_min* (1 point)
- *delete_min* (6 points)
- *change_key* (6 points)
- *size* (1 point)

You can find a Python3 template file on the website, which also includes some additional hints. As usual write unit tests for all important methods, and try to first write some tests before implementing the functionalities.

Hints:

- The *insert()* method creates an item object (*PriorityQueueItem* class included in template), appends it to the priority queue list and calls the *repair_heap_up()* method
- When you swap two items, do not forget to also swap their list indices
- Mark member variables and methods that you only use inside the class as private, using an underscore before the name (see template file for examples)

Commit
Commit your code into the SVN in a new subdirectory **uebungsblatt_06**. As usual commit

your feedback in a text file *erfahrungen.txt*. Therein please note the length of time needed for the exercise. Also describe which tasks have been difficult for you and where did you have problems.