

Design and Analysis of Algorithms

Exercises 7/8

1. Selecting start point of the TSP tour does also matter. Test your skills using the following test. The task is to select the point where you think optimal tour would start. Algorithm will then solve the optimal tour from this start point and show how far your result is from the optimal path. Complete 90 rounds and then you can see how your skills compare to others. Important: do this test only once and use your student number as your name ("who are you?"). Link to the game: <http://cs.uef.fi/~radum/StartPoint/>
2. Did you have some rule how to select the start point in task1? (a) If you developed some systematic way to select the start point, describe your rule. (b) Design simple algorithm for the start point selection.
3. Assuming we have a binary max-heap implemented using an **array**:
 - (a) Where does the smallest element reside in a max-heap?
 - (b) Give the smallest index M so that the k^{th} largest element is guaranteed to be in $A[1..M]$.
 - (c) How to find the k^{th} largest element using a max-heap?
4. In the lectures, it was shown how to do divide-and-conquer by selecting two random points. How could you divide by using 1 or 3 points, or generally divide to h parts by using m points? What other problems presented during the DAA course you could try to solve using random division?
5. Give open feedback for the course. Some guiding questions: How did you find the practical arrangements? What did you think about the covered topics (which were interesting / which not so much)? What's your opinion on the material (slides)? Were the YouTube videos watchable in terms of audio/visual quality? Which were your favourite videos, and which ones do you think need improvement? If you give enough comments, you will get a point for this.