Lab 4: Sorting by Brute-Force

COSC 3020: Algorithms and Data Structures

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03 October 2018

Instructions

Attempt to finish the tasks below during the lab time. You have until Friday, 05 October 2018, 23:59h to submit the solutions to WyoCourses. You may ask your TA for feedback before submitting, but this feedback will be qualitative only.

You may *not* use external libraries in your code unless explicitly stated.

1 Permutation Sort

We talked about the complexity of the sorting problem, and used an argument over all permutations of a list to be sorted to determine its complexity. Implement a function to sort a list by systematically trying all permutations of the input list. It should have the following signature:

```
function permutationSort(a);
```

The return value should be the number of permutations that were tried until the sorted list was "discovered".

Submit your complete code, including a function that demonstrates that your implementation works with a few test inputs.

Total 6 points.

2 Runtime Analysis

What is the runtime complexity of the algorithm that you implemented? What does a best case input for your implementation look like, what does a worst case input look like? How would this complexity change if you generated permutations randomly without memory instead of systematically trying them?

Submit a PDF document describing your reasoning and the answers. Your reasoning is the most important part.

Total 4 points.