DM819 - Computational Geometry

Fall 2015
Project 2

Mikkel Levisen and Jesper Lund

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Contents

1 Introduction

This report details the implementation of KD-Tree and Range-Tree for n-dimensional input. Each tree is constructed from a list of unsorted points and is capable of performing orthogonal range queries.

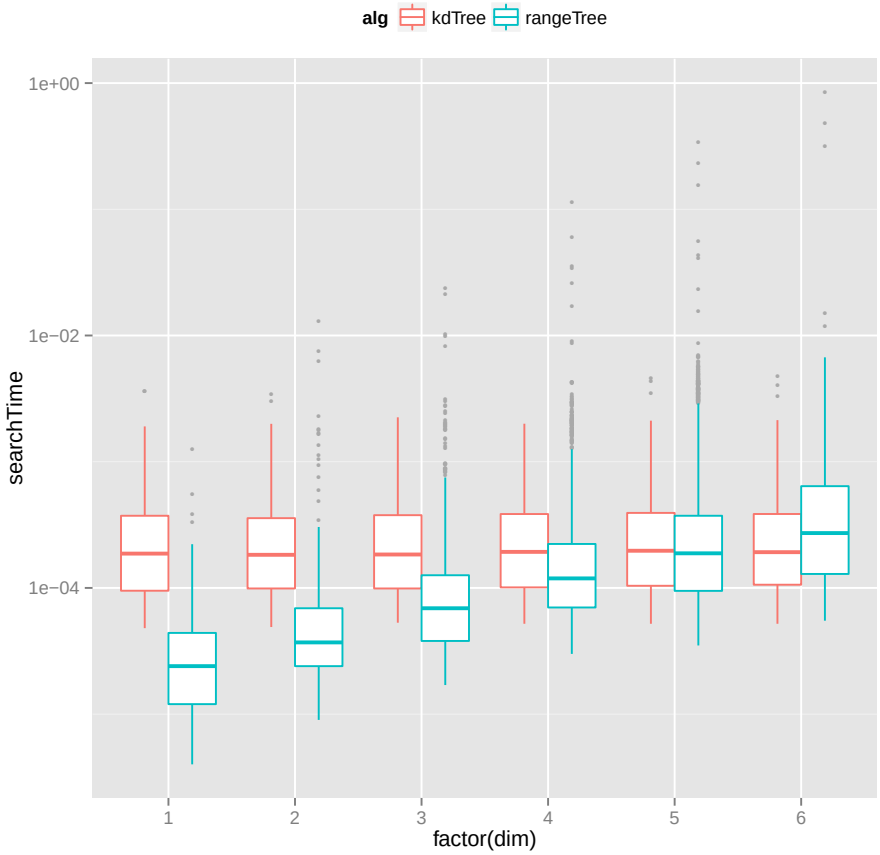
2 KD-Tree

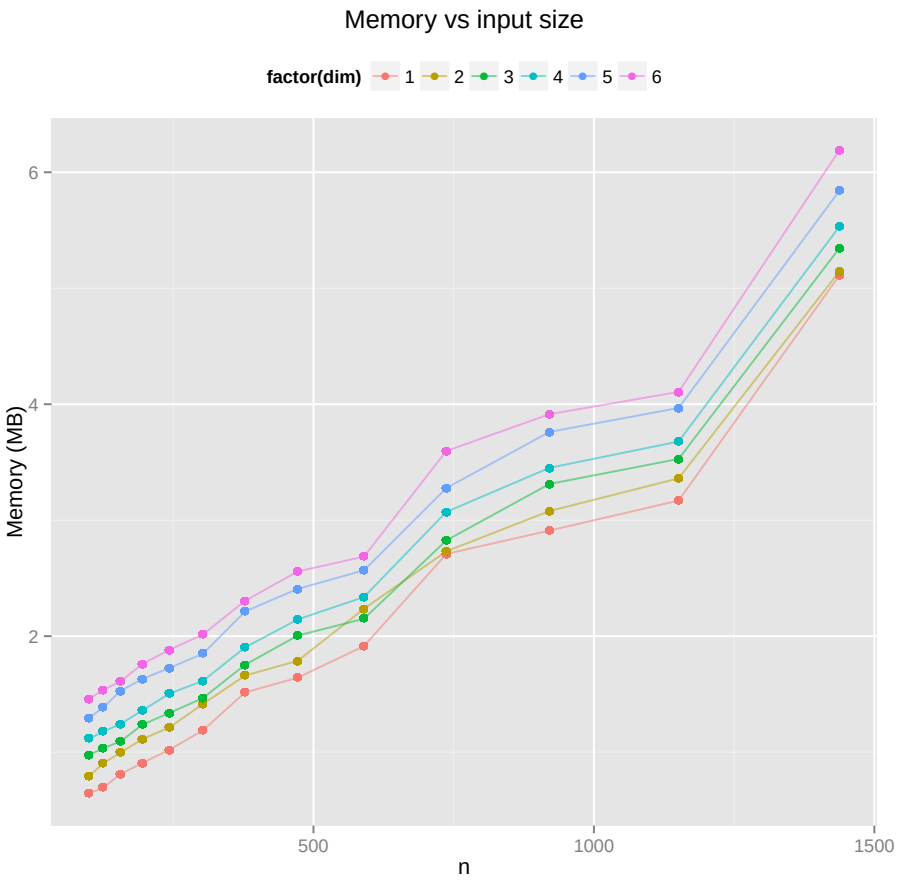
2.1 Complexity

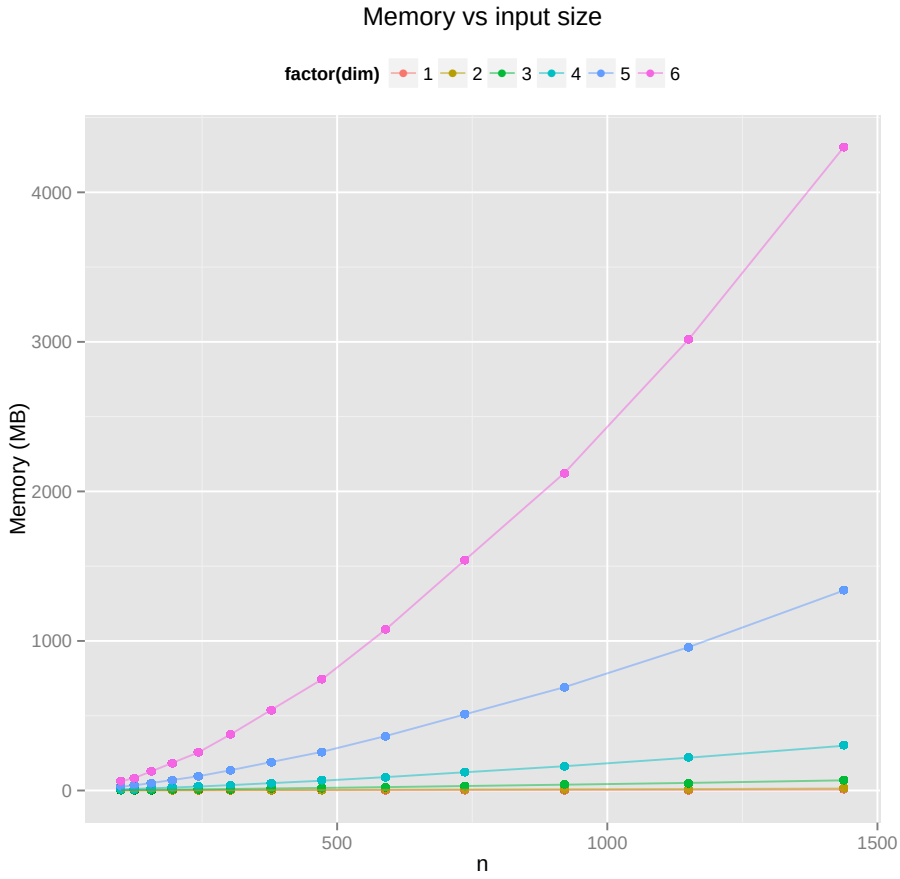
3 Range-Tree

3.1 Complexity

4 Test




Memory vs input size
factor(dim)
1
2
3
4
5
6
Memory (MB)
2
4
6
500
1000
1500
n



5 Manual

5.1 File Structure

```
ROOT
|-- report/
`-- src
    |-- kdtree
    |   |-- inspect.lua
    |   |-- kdtree.lua
    |   `-- test.lua
    |-- R
    |   `-- makePlots.R
    |-- rangeTree
    |   |-- inspect.lua
    |   |-- middleclass
```

```
|   |   `-- middleclass.lua
|   |-- RangeTree.lua
|   `-- test.lua
|-- results/
|-- runTests.py
`-- tests
    |-- createCustomTest.lua
    |-- dimension_1/
    |-- dimension_2/
    |-- dimension_3/
    |-- dimension_4/
    |-- dimension_5/
    |-- dimension_6/
    |-- genTestSuite.lua
    `-- inspect.lua
```

6 Conclusion