Orthogonal Range Searching in 2D using Ball Inheritance

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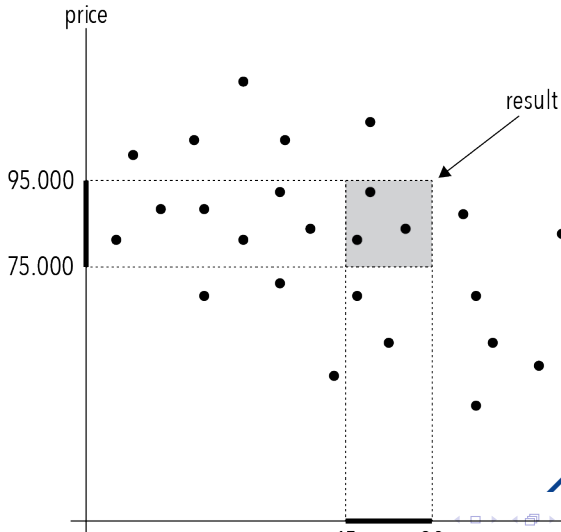
Preleminaries

- Alle koordinater er unikke
- Rank space
- n er en potens af 2

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Orthogonal Range Searching

Vi er givet n punkter fra $\mathbb{R}^2$ som vi ønsker at indsætte i en datastruktur sådan at vi kan svare effektivt på forespørgslen $q = [x_1, x_2] \times [y_1, y_2]$.

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kd-træ

kd-træ

- $\mathcal{O}(n)$ plads
- $\mathcal{O}(\sqrt{n} + k)$ tid

Givet n punkter: Punkterne bliver sorteret efter x eller y på skift. Median bliver fundet og punkterne mindre end medianen bliver givet til venstre barn og punkterne højere end medianen bliver givet til højre barn. Et punkt per blad i træet.
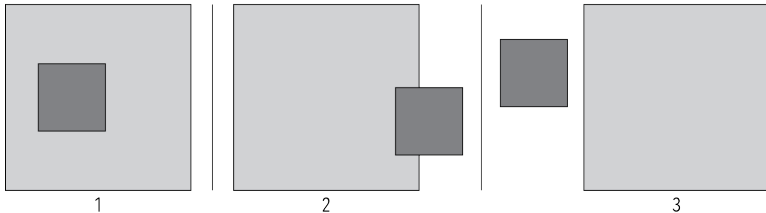
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Opbygning af kd-træ

Det $\lceil \frac{n}{2} \rceil$'te element bliver valgt som median. Dette element fungerer som en skille-linje mellem de to punkt-mængder. Medianen bliver låst fast på denne plads i arrayet.
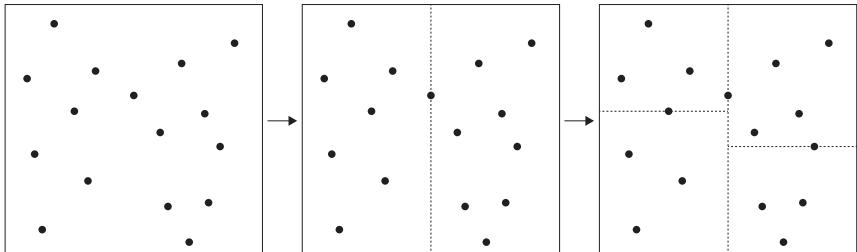
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Søgning i kd-træ

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First Slide Title
Optional Subtitle

- My first point.
- My second point.

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1. **Introduction**
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   - Ball Inheritance

2. Second Main Section
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Ball Inheritance

Given a perfect balanced binary tree, each ball include a list of the balls passing through. Consider each ball to have $\lg n$ copies - one for each level in the tree.

Outline

Blocks

Block Title

You can also highlight sections of your presentation in a block, with it's own title

Theorem

There are separate environments for theorems, examples, definitions and proofs.

Example

Here is an example of an example block.

Summary

- The first main message of your talk in one or two lines.
- The second main message of your talk in one or two lines.
- Perhaps a third message, but not more than that.

- Outlook
  - Something you haven't solved.
  - Something else you haven't solved.

For Further Reading I

📕 A. Author.
   Handbook of Everything.
   Some Press, 1990.

📄 S. Someone.
   On this and that.
   Journal of This and That, 2(1):50–100, 2000.