

# Data Structures

Maarten Dhondt

Realdolmen

June 23, 2017



# Who am I?

...



# Outline

- ① Introductory Data Structures
  - Array
  - Linked List
  - Hash Table
  - Heap
  - Red-Black Tree
- ② Java Collection API & Map API
  - Java Collection API
  - Java Map API
- ③ Advanced Data Structures
  - Stuff. . .



# Outline

## 1 Introductory Data Structures

- Array
- Linked List
- Hash Table
- Heap
- Red-Black Tree

## 2 Java Collection API & Map API

- Java Collection API
- Java Map API

## 3 Advanced Data Structures

- Stuff...



# Data Type vs. Data Structure

- Data type  $\neq$  data structure



# Data Type vs. Data Structure

- ▶ Data type  $\neq$  data structure
- ▶ `java.util.HashSet` vs. hash table
- ▶ array vs. array



# Outline

## 1 Introductory Data Structures

- Array
- Linked List
- Hash Table
- Heap
- Red-Black Tree

## 2 Java Collection API & Map API

- Java Collection API
- Java Map API

## 3 Advanced Data Structures

- Stuff...



# Array

...





# Array

...



# Outline

## 1 Introductory Data Structures

- Array
- Linked List**
- Hash Table
- Heap
- Red-Black Tree

## 2 Java Collection API & Map API

- Java Collection API
- Java Map API

## 3 Advanced Data Structures

- Stuff...



# Linked List

...



# Linked List

...



# Outline

## 1 Introductory Data Structures

Array  
Linked List  
**Hash Table**  
Heap  
Red-Black Tree

## 2 Java Collection API & Map API

Java Collection API  
Java Map API

## 3 Advanced Data Structures

Stuff...



# Hash Table

...



# Hash Table

...



# Outline

## 1 Introductory Data Structures

Array  
Linked List  
Hash Table  
**Heap**  
Red-Black Tree

## 2 Java Collection API & Map API

Java Collection API  
Java Map API

## 3 Advanced Data Structures

Stuff...





# Tree

...



# Binary Heap

...



# Binary Min-Heap

...



# Outline

## 1 Introductory Data Structures

- Array
- Linked List
- Hash Table
- Heap
- Red-Black Tree

## 2 Java Collection API & Map API

- Java Collection API
- Java Map API

## 3 Advanced Data Structures

- Stuff...



# Red-Black Tree

...



# Red-Black Tree

...



# Outline

- 1 Introductory Data Structures
  - Array
  - Linked List
  - Hash Table
  - Heap
  - Red-Black Tree
- 2 Java Collection API & Map API
  - Java Collection API
  - Java Map API
- 3 Advanced Data Structures
  - Stuff...



# Outline

- 1 Introductory Data Structures
  - Array
  - Linked List
  - Hash Table
  - Heap
  - Red-Black Tree
- 2 Java Collection API & Map API
  - Java Collection API
  - Java Map API
- 3 Advanced Data Structures
  - Stuff...





# Java Collection API

...



# Java Collection API

...



# Outline

- 1 Introductory Data Structures
  - Array
  - Linked List
  - Hash Table
  - Heap
  - Red-Black Tree
- 2 Java Collection API & Map API
  - Java Collection API
  - Java Map API
- 3 Advanced Data Structures
  - Stuff...



# Java Map API

...



# Java Map API

...



# Outline

- 1 Introductory Data Structures
  - Array
  - Linked List
  - Hash Table
  - Heap
  - Red-Black Tree
- 2 Java Collection API & Map API
  - Java Collection API
  - Java Map API
- 3 Advanced Data Structures
  - Stuff...



# Outline

- 1 Introductory Data Structures
  - Array
  - Linked List
  - Hash Table
  - Heap
  - Red-Black Tree
- 2 Java Collection API & Map API
  - Java Collection API
  - Java Map API
- 3 Advanced Data Structures
  - Stuff...



Stuff...

...

