# Data Structures II

- *heapify demo*

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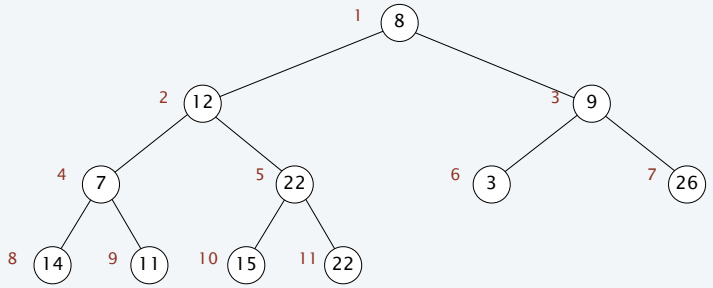
## Heapify demo

Heapify. For each element in reverse-array order, sink it down.

we assume array entries are indexed 1 to N

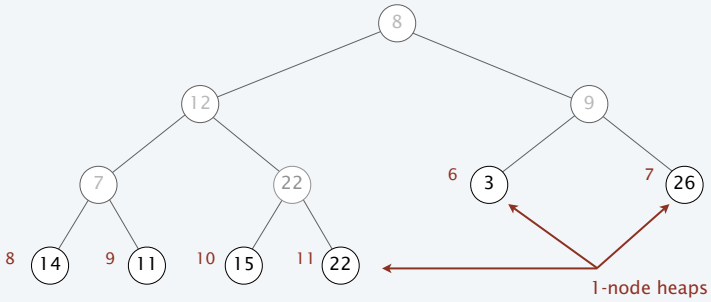
**array in arbitrary order**




| 8 | 12 | 9 | 7 | 22 | 3 | 26 | 14 | 11 | 15 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

## Heapify demo

Heapify. For each element in reverse-array order, sink it down.

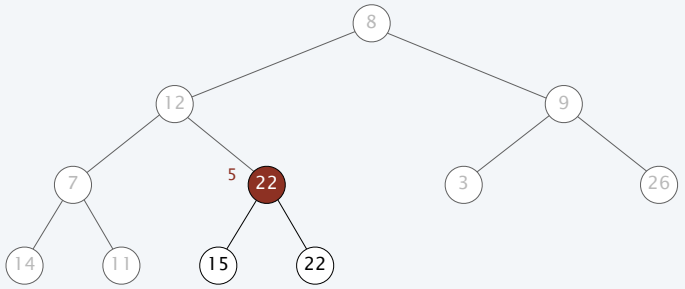



| 8 | 12 | 9 | 7 | 22 | 3 | 26 | 14 | 11 | 15 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 6 | 7 | 8 | 9 | 10 | 11 |

## Heapify demo

Heapify. For each element in reverse-array order, sink it down.

**sink 5**

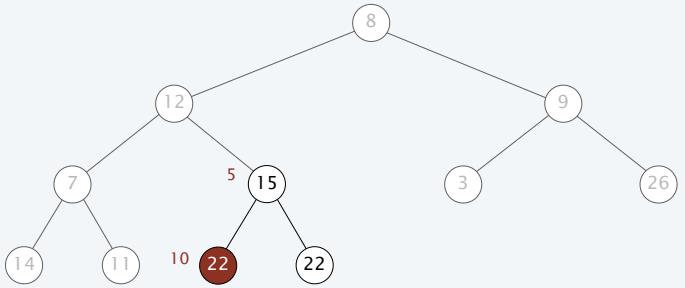



| 8 | 12 | 9 | 7 | 22 | 3 | 26 | 14 | 11 | 15 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 5 | | | | | | |

## Heapify demo

Heapify. For each element in reverse-array order, sink it down.

**sink 5**




| 8 | 12 | 9 | 7 | 15 | 3 | 26 | 14 | 11 | 22 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 5 | | | | | 10 | |

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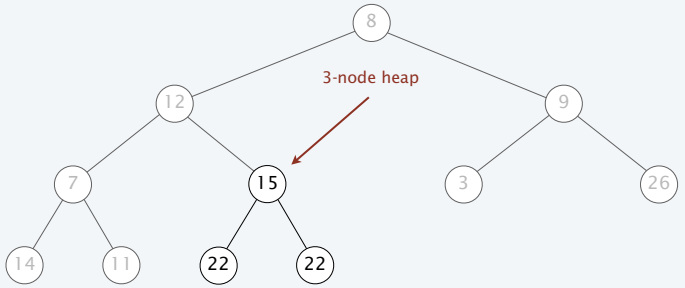
Heapify. For each element in reverse-array order, sink it down.

**sink 5**

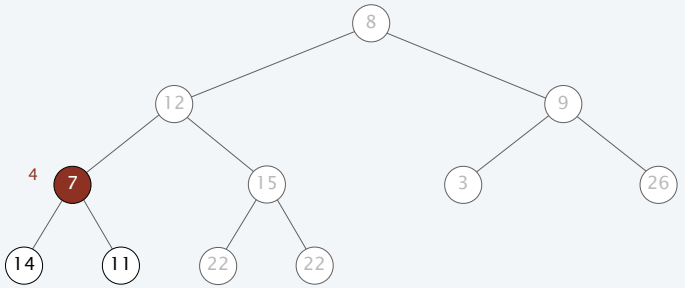



| 8 | 12 | 9 | 7 | 15 | 3 | 26 | 14 | 11 | 22 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|

## Heapify demo

Heapify. For each element in reverse-array order, sink it down.

**sink 4**

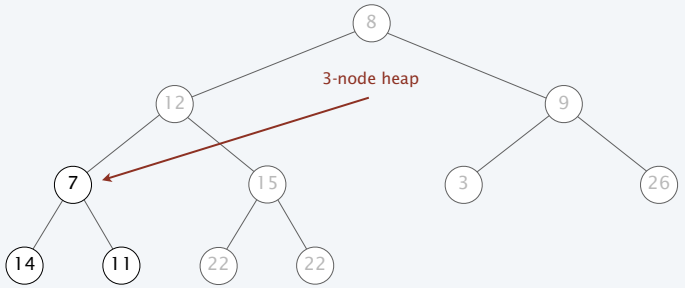



| 8 | 12 | 9 | 7 | 15 | 3 | 26 | 14 | 11 | 22 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 4 | | | | | | | |

## Heapify demo

Heapify. For each element in reverse-array order, sink it down.

**sink 4**

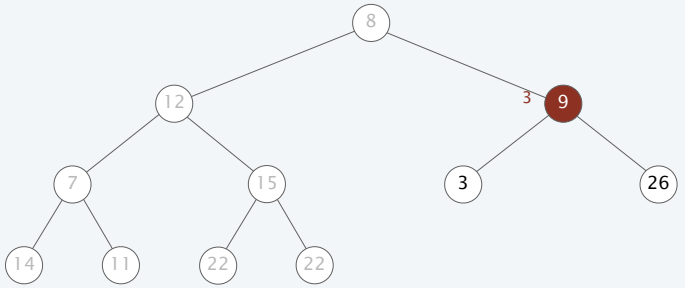



| 8 | 12 | 9 | 7 | 15 | 3 | 26 | 14 | 11 | 22 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|

## Heapify demo

Heapify. For each element in reverse-array order, sink it down.

**sink 3**

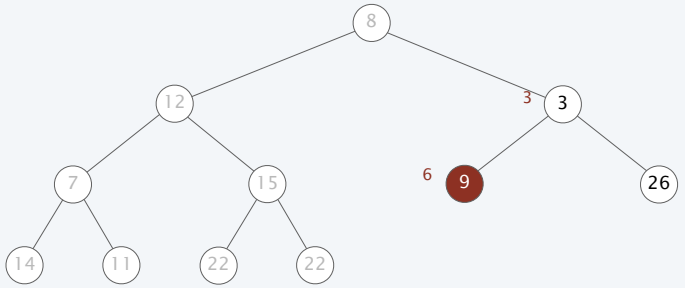



| 8 | 12 | 9 | 7 | 15 | 3 | 26 | 14 | 11 | 22 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 3 | | | | | | | | |

## Heapify demo

Heapify. For each element in reverse-array order, sink it down.

**sink 3**

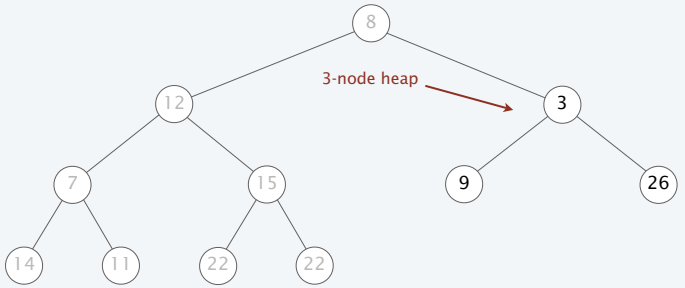



| 8 | 12 | 3 | 7 | 15 | 9 | 26 | 14 | 11 | 22 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 3 | | | 6 | | | | | |

## Heapify demo

Heapify. For each element in reverse-array order, sink it down.

**sink 3**

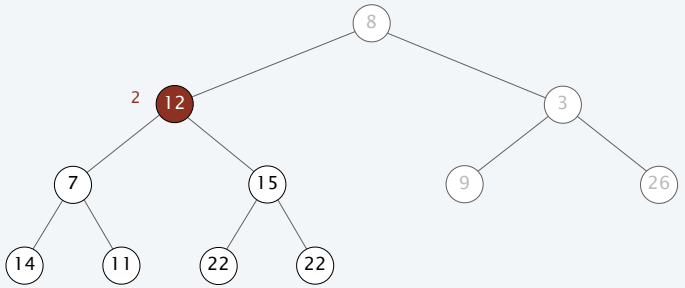



| 8 | 12 | 3 | 7 | 15 | 26 | 26 | 14 | 11 | 22 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|

## Heapify demo

Heapify. For each element in reverse-array order, sink it down.

**sink 2**

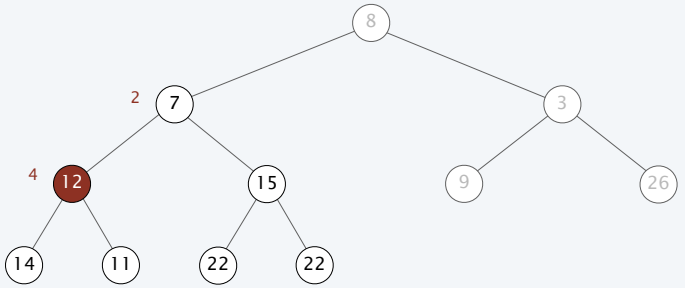



| 8 | 12 | 3 | 7 | 15 | 9 | 26 | 14 | 11 | 22 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | | | | | | | | | |

## Heapify demo

Heapify. For each element in reverse-array order, sink it down.

**sink 2**

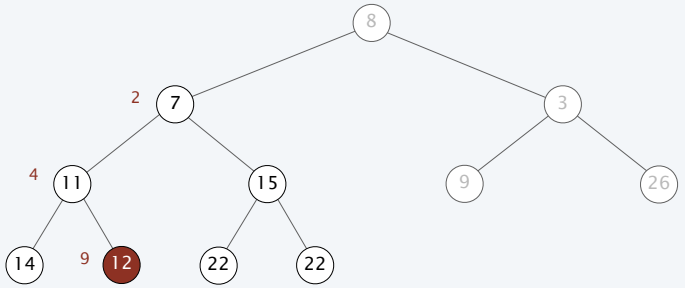



| 8 | 7 | 3 | 12 | 15 | 9 | 26 | 14 | 11 | 22 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | | 4 | | | | | | | |

## Heapify demo

Heapify. For each element in reverse-array order, sink it down.

**sink 2**

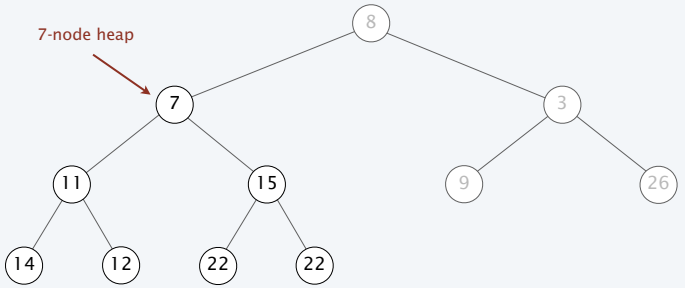



| 8 | 7 | 3 | 11 | 15 | 9 | 26 | 14 | 12 | 22 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | | 4 | | | | | 9 | | |

## Heapify demo

Heapify. For each element in reverse-array order, sink it down.

**sink 2**

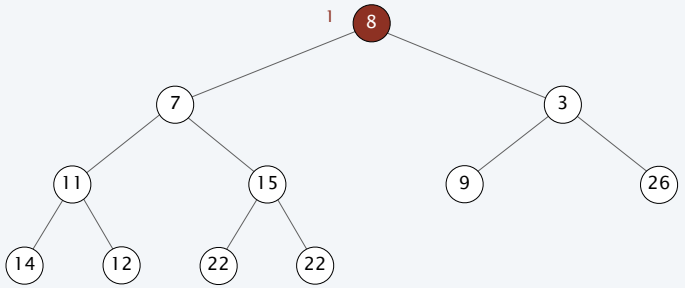



| 8 | 7 | 3 | 11 | 15 | 9 | 26 | 14 | 12 | 22 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|

## Heapify demo

Heapify. For each element in reverse-array order, sink it down.

**sink 1**

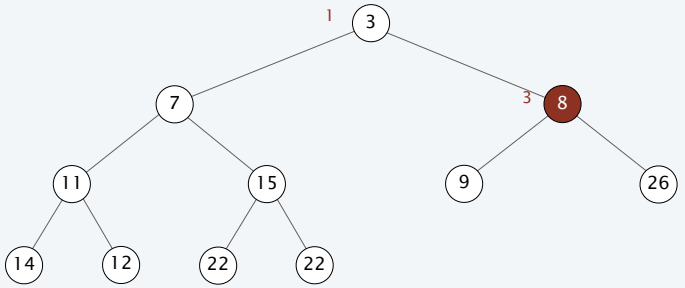



| 8 | 7 | 3 | 11 | 15 | 9 | 26 | 14 | 12 | 22 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |

## Heapify demo

Heapify. For each element in reverse-array order, sink it down.

**sink 1**

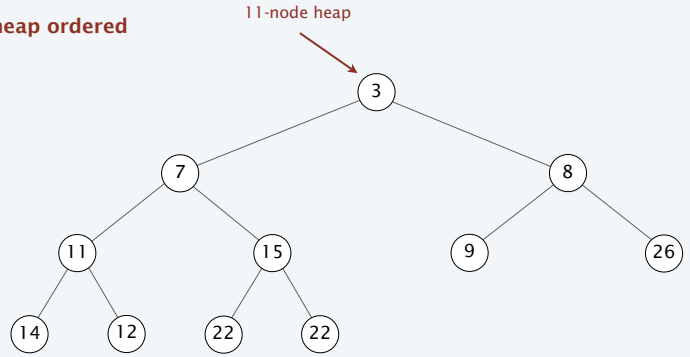



| 3 | 7 | 8 | 11 | 15 | 9 | 26 | 14 | 12 | 22 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 3 | | | | | | | | |

## Heapify demo

Heapify. For each element in reverse-array order, sink it down.

**array is heap ordered**




| 3 | 7 | 8 | 11 | 15 | 9 | 26 | 14 | 12 | 22 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|