# CSE 250 Recitation

10/30-10/31: Heaps, Dijkstra’s Algorithm

# Orderings

We know:

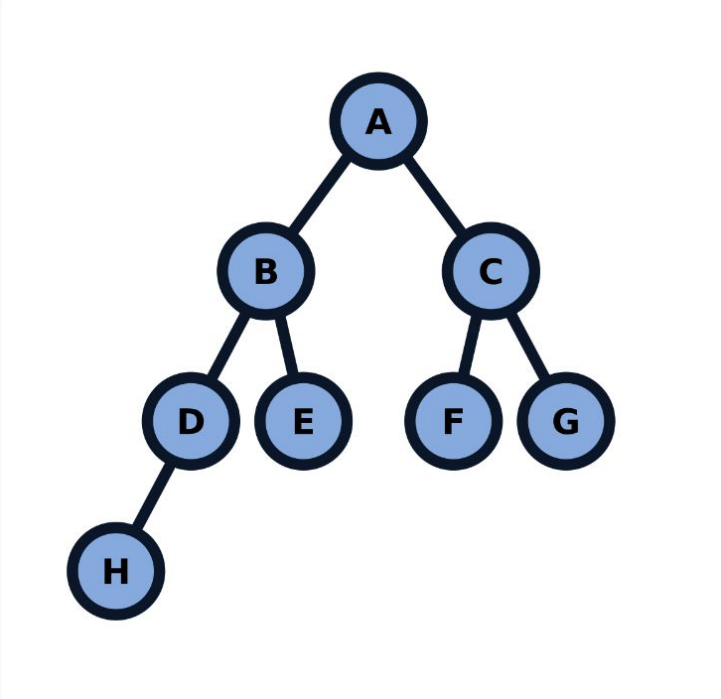
- A < B
- A < C
- B < D
- B < E
- C < F
- C < G
- D < H

- What other relationships can we infer?
- What is the smallest number of extra tests we need to…
  - Find the smallest value?
  - Find the second smallest value?
  - Find the third-smallest value?
  - Find the fourth-smallest value?

# Heaps

We know:

- A < B
- A < C
- B < D
- B < E
- C < F
- C < G
- D < H



# Heaps

Are the following arrays valid heaps?

9 7 4 5 6 2 3

# Heaps

Are the following arrays valid heaps?

20 7 15 2 5 12 9 6 4 1 3

# Heaps

Find tight bounds for inserting sequence of items into a max heap when the sequence is already sorted in **descending order**.

# Heapify

Trace the execution of Heapify on the following array

9 6 8 1 5 4 15 3 7 14 11 10 2 13 12

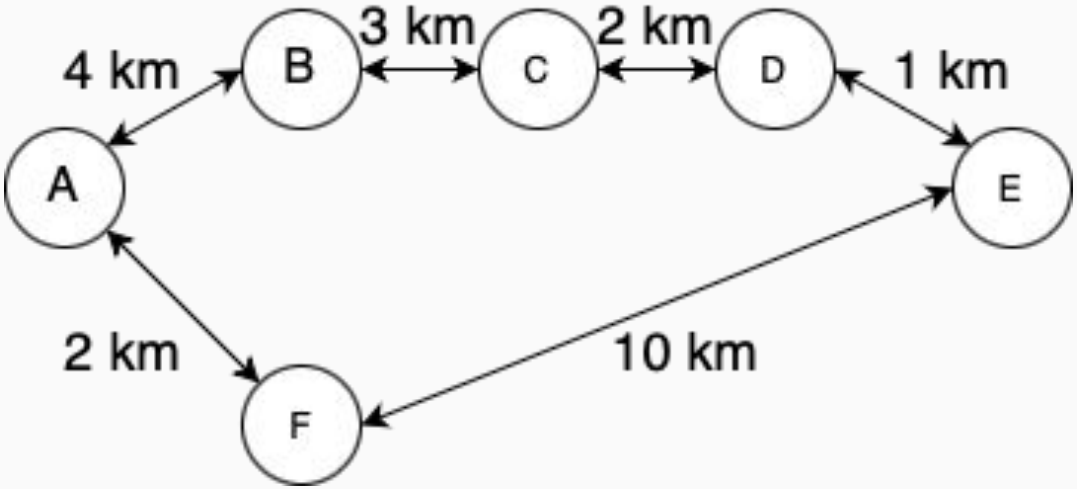
# Dijkstra’s Algorithm

Like “BFS”, but with a Priority Queue

- Visit vertices in order of ascending distance from the start
- Visiting a vertex means enqueuing every adjacent node

Generally, you keep track of the path from the root to each vertex as it’s enqueued.

# Dijkstra’s Algorithm




- Path from C to F
- Path from A to E