CSE 250 Recitation

April 3 - 7: PA3, Orderings, Priority Queues and Heaps
PA3: Getting Started

- **PA3** is all about graph traversal
- As with **PA2**, you will start by first writing tests
- **REMEMBER:** You do not need to know how to implement a method to test that method!
  - For example, one of the methods finds the shortest path in a graph...you can still come up with example graphs, and know what the shortest paths are, without knowing how to find them algorithmically yet

- **That leads to our first exercise...coming up with good example graphs**
PA3: Getting Started

- What is the adjacency list for the graph to the right?
- What should BFS find when start = A, end = C?
- Start asking "what if?" questions. Try to think of things that might break, or issues your sample graphs and sample searches might not catch.
  - For example, what if we did Djikstra's instead of BFS...does the graph to the right differentiate between the two?
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
Find tight bounds for inserting sequence of items into a heap when the sequence is already sorted in \textit{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