2 Administrivia
   • Solutions, testers, etc. up!

3 Agenda
   • Graphs
     – Unweighted graphs
   • Graphs are the last topic! $8O$

4 What are graphs?
   • Linked list :: trees $\rightarrow$
     trees :: graphs
   • In other words, we no longer limit the number of children each node may have,
     and we don’t forbid loops
     – (Sometimes!)
   • Examples?
     – Bridges of Konigsburg (p. 619)
       • Solution: vertices of odd degree make it impossible
       • Foundation of graph theory (1736)

5 Definitions
   • Adjacency
   • Path
     – Multiple definitions $\exists$
   • Connected graph
   • Directed graph
   • Weighted graph
     – These two come later!

6 Representing a graph
   • The OO way
   • The canonical (and book) way
     – Adjacency matrix
       • I lied – we will use 2D matrices
     – Adjacency list
   • Advantages and disadvantages?
   • Book => separate vertex class
   • For some reason, the book does it the latter

7 Searching graphs?
   • Goal: find connectivity
   • Depth-first search
     – Push node on a stack
While stack not empty:
  • Peek and get an unvisited adjacent node
  • Visit it (pushing it on the stack)
  • If no adjacent nodes, pop and repeat
  • Game searching and branching factor
    • Breadth-first search
      • Same process, but queue instead

Next time
  • Continue unweighted graphs