

CS367 Lecture 28

Monday 4 August 2014

Announcements/Reminders:

- HW7 due tonight
- P4 due tomorrow night
- Readings for Sorting, Graphs
- Final on Thursday
- Review session and course wrapup on Wednesday

Last class:

- Sorting (finish)
 - Radix Sort
 - Stable sorts
 - Sorting in Java
- Graphs (intro)

Today:

- (Last) Week in Review
- Graphs (cont'd)
 - Using Edge Representations
 - Searches/Traversals: Depth-First Search

(Last) Week in Review

- Hashing
 - Collision Handling in Open Addressing
 - Hashing in Java
- Sorting
 - Problem, Definition
 - Basic Sorts: Bubble Sort, Insertion Sort, Selection Sort
 - Smarter Sorts: Heap Sort, Merge Sort, Quicksort
 - Choosing a pivot for quicksort
 - Radix Sort
 - Stable Sorts
 - Sorting in Java
- Graphs
 - Concept, Terminology
 - Representing Edges

Using Edge Representations

Compute the degree of a node in an undirected graph when edges are represented as:

Adjacency matrix:

Adjacency list:

Computing in-degree in a directed graph:

Euler Paths/Cycles: The Königsberg Bridge Problem

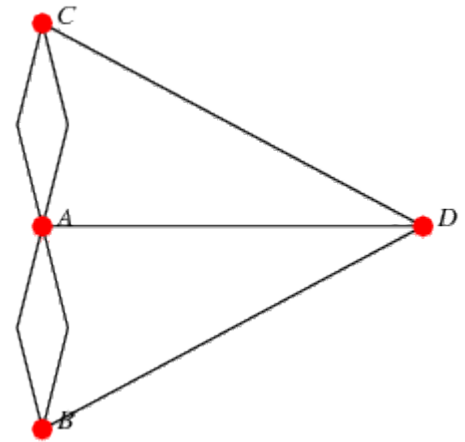
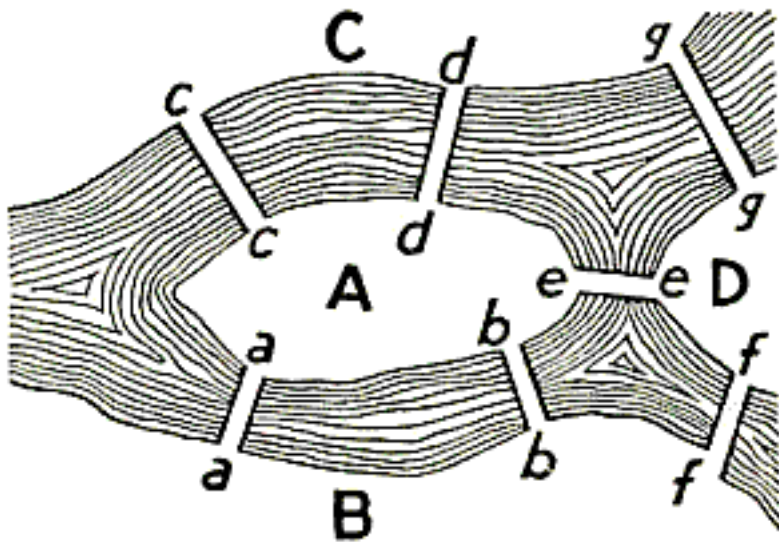


FIGURE 98. *Geographic Map:
The Königsberg Bridges.*

Searches and Traversals

Search

Traversal

Depth-First Search (DFS)

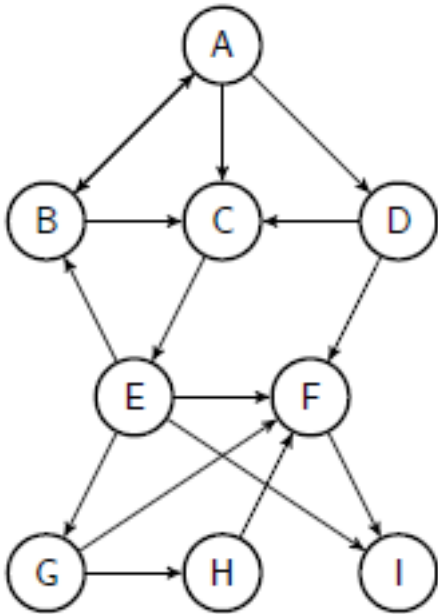
What kind of questions can we answer?

Recursive Definition:

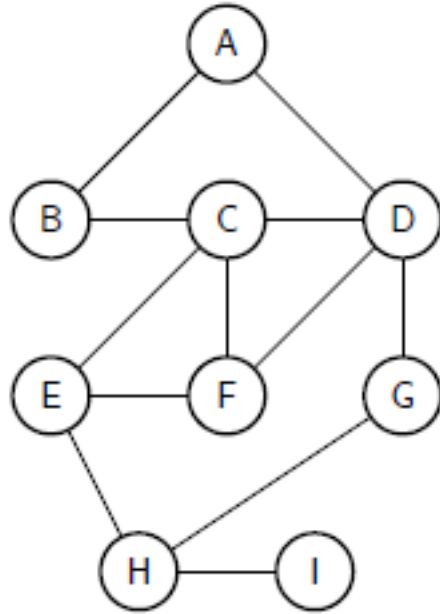
Using a stack:

DFS Examples

Graph 1



Graph 2



DFS node visit order beginning at A:

Graph 1:

Graph 2:

DFS spanning tree starting at A:

Graph 1:

Graph 2: