Chap 6. Graphs

Terminology and Definition

- Königsberg bridge problem
- Figure 6.1
- Figure 6.2
- Figure 6.3
- Figure 6.4
- Figure 6.5
- Figure 6.6
- Terminology and definitions
- ADT 6.1

Graph Representations

- Adjacency matrix
  - Figure 6.7
- Adjacency list
  - Figure 6.8

Graph operations

- Depth first search
  - Declaration // § 6.2.1
  - Program 6.1
  - Example 6.1
  - Figure 6.16
- Breadth first search
  - Declaration // § 6.2.2
  - Program 6.2
- Connected components
  - Program 6.3
- Spanning tree
  - Figure 6.17
  - Figure 6.18

Minimum cost spanning tree

- Cost of weighted undirected graph
- Minimum cost spanning tree
- Greedy methods
  - Kruskal's algorithm
  - Prim's algorithm
  - Sollin's algorithm
- Conditions
  - Only the edges in the graph
  - Exactly n-1 edges (n: the number of vertices)
  - Acyclic

Algorithms

- Kruskal's algorithm
  - Example 6.3
    - Figure 6.22
    - Figure 6.23
  - Program 6.7
  - Theorem 6.1
  - Using representation of disjoint sets
- Prim's algorithm
  - Program 6.8
  - Figure 6.24
- Sollin's algorithm
  - Figure 6.25

Shortest paths

- Dijkstra's algorithm
- Observations
- Figure 6.26
- Program 6.9
- Program 6.10
- Finding predecessors as well
- INT_MAX
  - A poor choice for nonexistent edge