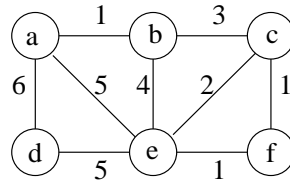


# Analysis of Algorithms: Assignment 7

Due date: April 12 (Wednesday)

**Problem 1** (5 points)



(a) Using Figure 24.4 in the textbook as a model, illustrate the steps of Kruskal's algorithm on the above undirected graph.

(b) Using Figure 24.5 as a model, show the steps of Prim's algorithm on the same graph, with vertex  $d$  as the source.

**Problem 2** (5 points)

*This problem is inherited from Exam 2; you should write a solution even if your received the full credit for solving it during the exam.*

The breadth-first search algorithm presented in class is for the adjacency-list representation. Give a BFS algorithm for the adjacency matrix, and determine its running time ( $O$ -notation).

**Problem 3** (bonus)

*This optional problem, also from Exam 2, allows you to get 2 bonus points toward your final grade. You cannot submit it after the deadline.*

Give a nonrecursive version of depth-first search; the time complexity of your algorithm should be the same as the complexity of the recursive version.