CPSC 629 Homework 5

March 26, 2008

Homework 5 is due Wednesday, April 9 in class.

Read chapters 22, 23, 24 (omitting 24.4), 25. Turn in the following exercises

1. Let G = (V,E) be a directed acyclic graph. Show how to determine in $\mathcal{O}(|V^2|)$ time if there exists a pair of vertices u,v such that there are two different simple paths (a path is simple if it does not repeat any vertices, i.e. no cycles) from u to v in G.

2. Problem 22-3, page 559

3. Show how to modify the data structure to improve the running time of Prim's and Dijkstra's algorithms if it is known that the weights are integers in the range [1..W] for some constant W. What is the running time of the improved algorithms?

4. Show how to modify the Bellman-Ford algorithm to compute the longest path in a directed acyclic graph with weighted edges.

5. Problem 24-6, page 618

6. Exercise 25.3-6, page 640