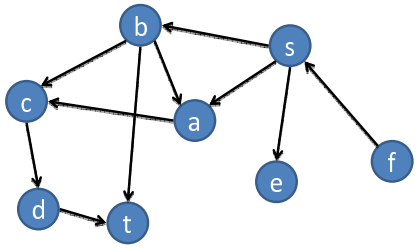
CS4311 Design and Analysis of Algorithms

Homework 7

Due: 10:10 am, June 18, 2009

Submission method: During class, or email to `wiselyku@gmail.com`

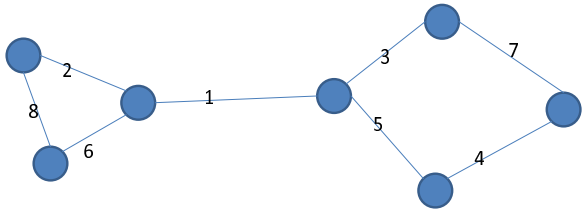
1. (50%) Suppose G is a directed acyclic graph, and s and t are two vertices in G. Design a linear-time algorithm that counts the number of different paths from s to t.



How many paths from s to t ?

Hint: Consider applying topological sort and then dynamic programming.

2. (50%) Suppose $G = (V, E)$ is a connected undirected graph where each edge is given a distinct label from 1 to $|E|$. Design a linear-time algorithm that finds the minimum number m such that the vertices in G will still be connected using only edges with labels from 1 to m.



What is the number m in this graph?

Hint: DFS/BFS, binary search on m, contracting connected components.