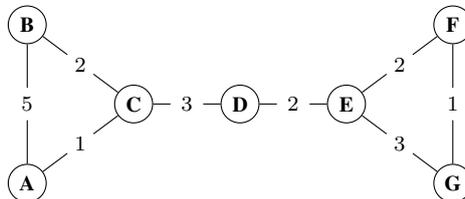


Knowledge Discovery in Databases II  
WS 2014/2015

Übungsblatt 13: Graph and Link Mining

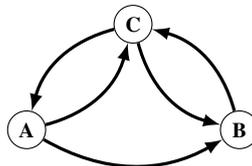
**Aufgabe 13-1 Betweenness Centrality**

Calculate Betweenness Centrality of all nodes in the following weighted graph:



**Aufgabe 13-2 Pagerank**

Given the following (web) graph:



- (a) Determine the graph's adjacency matrix.
- (b) Determine the matrix  $L$  of transition probabilities for the random surfer model in PageRank.
- (c) Determine the probability for the random surfer to be in a given state at time  $t = 5$ . Assume an equally distributed start node distribution over all nodes.
- (d) Determine the stationary probability of all nodes at  $t = \infty$ .