

Problem Set 3

due: November 4, 2019

Exercise 1

8 points

Consider the instance (G, c) of the Chinese Postman Problem described in Figure 1.

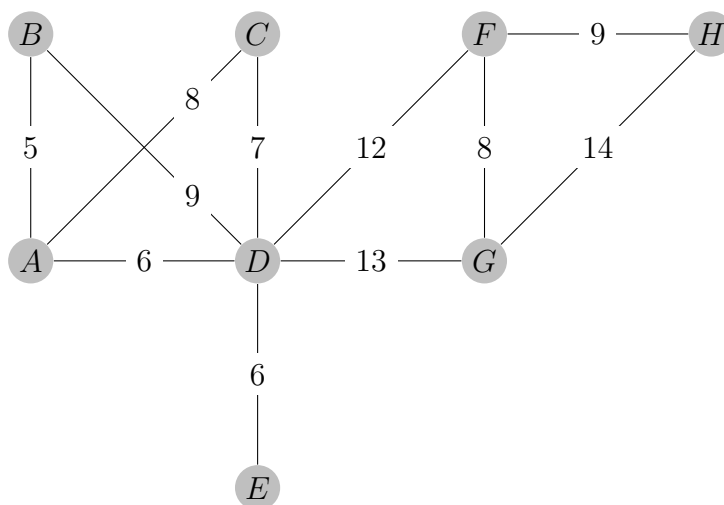


Figure 1: The graph G with edge costs c_e for every $e \in E(G)$.

Use the Edmonds-Johnson algorithm to solve the Chinese Postman Problem on (G, c) , i.e., compute a tour visiting each edge of G at least once of minimum cost w.r.t. c .

Exercise 2

8 points

Consider a connected undirected graph G with a cost function $c : E(G) \rightarrow \mathbb{R}_{\geq 0}$, and let $T \subseteq V(G)$ be of even cardinality. Show that a subset $J \subseteq E(G)$ is a minimum cost T -join w.r.t. c in G if and only if for every circuit C in G holds $c(E(C) \cap J) \leq \frac{1}{2}c(E(C))$.

Exercise 3

4 points

Characterize all graphs G having a circuit C which is both a Hamiltonian circuit and an Euler tour. Prove your result.