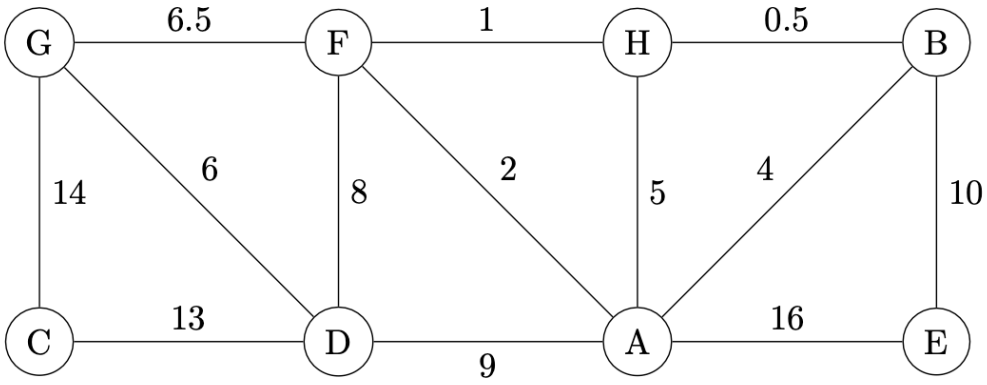
CS251 - Data Structures and Algorithms
Fall 2024

PSO 11, Week 13

Question 1

(Prim's Algorithm)

1. Consider the following undirected graph. Assume that the graph is represented in adjacency-list form and that each adjacency-list is given in lexicographic order. List the order that edges are added when we run **Prim's algorithm** starting at node A.



2. Suppose that the graph $G = (V, E)$ is represented as an adjacency-matrix. Give a simple implementation of the Prim's algorithm for this case that runs in $O(|V|^2)$ time.

Question 2

(Backward pattern matching)

Consider the following string pattern matching scenario:

$$T := \underbrace{aaa\cdots a}_{9} \quad \text{and} \quad P := baaaaa.$$

1. Run Brute-Force Algorithm on the scenario.

2. The Boyer-Moore algorithm is based upon backward pattern matching. Calculate the last-occurrence function and run Boyer-Moore algorithm on the scenario.

3. Is there any other pattern matching algorihtm that works better in this scenario?