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Algorithms and data structures

Tutorial 7: Data Structure: Graphs

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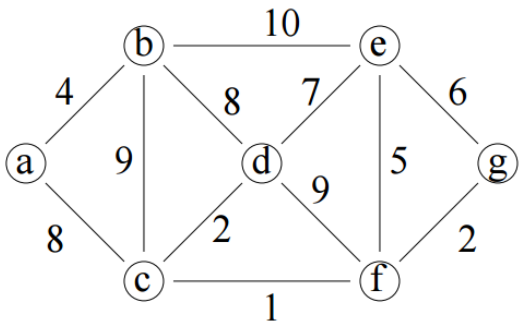
Exercise 1:
Suppose a undirected and weighted graph as in the following figure:



- Write a function initEdge(char s, char d, float val) where s is the id of source vertex and d is the id of destination vertex and val is the weight of edge formed between s and d. The return type is your choice.
- Write a function initGraph() which calls initEdge() to create the whole graph in the figure. The return type is your choice.
- Write a function to create an adjacency matrix of the graph from the return of initGraph(). Select either array-based or linked list implementation to store this matrix. Explain the reason of your selection.
- Write a function to display the adjacency matrix according to your implementation choice.
- To traverse the graph, we follow the following steps:
  - choose a starting vertex, store it in a linked list stack.
  - find all possible adjacent vertices for the vertices in the stack. Randomly choose one of them and put it into the stack.

– repeat the steps until all graph vertices are visited.

Implement a function to complete this process and display the random path

- Write a function to compute the total weight from the output path
- Write a main function including necessary functions to test all the tasks.