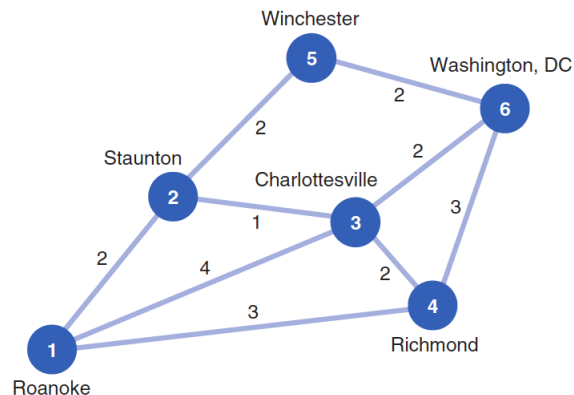


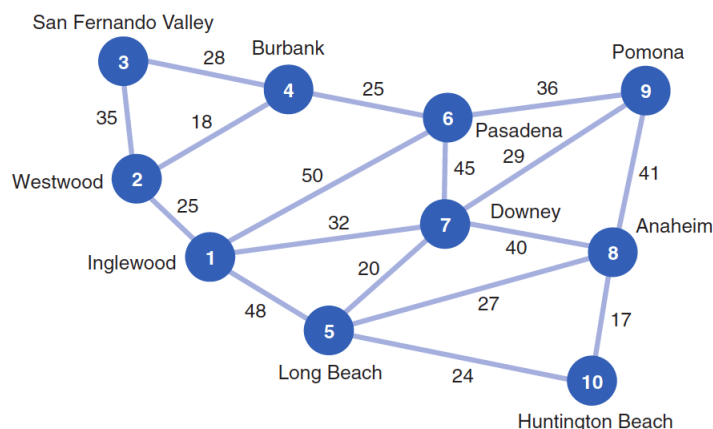
Homework #6 – due Friday, March 12th, 2021

1. Frieda Millstone and her family live in Roanoke, Virginia, and they are planning an auto vacation across Virginia, their ultimate destination being Washington, DC. The family has developed the following network of possible routes and cities to visit on their trip:



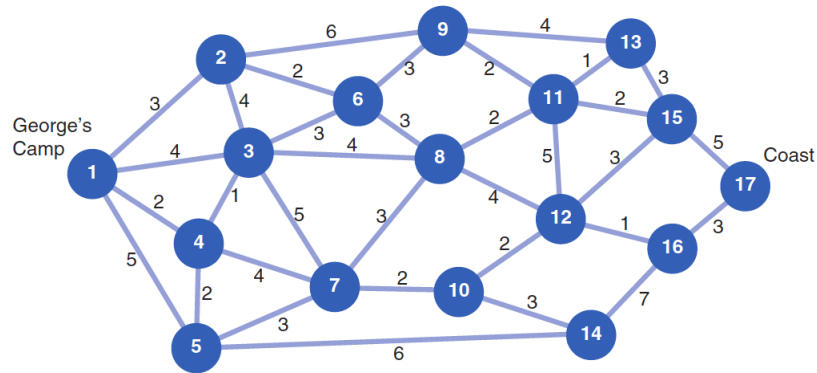
The time, in hours, between cities (which is affected by the type of road and the number of intermediate towns) is shown along each branch. Determine the shortest route that the Millstone family can travel from Roanoke to Washington, DC. Assume that the family will only travel in a north-east direction, that is, assume edges are directed from lower node index to larger node index. Use the Dijkstra algorithm by hand.

2. The Burger Doodle restaurant franchises in Los Angeles are supplied from a central warehouse in Inglewood. The location of the warehouse and its proximity, in minutes of travel time, to the franchises are shown in the following network:



Trucks supply each franchise on a daily basis. Determine the shortest route from the warehouse at Inglewood to each of the nine franchises by setting up a linear program and solving it in Excel.

- (a) Assume that all edges can be travelled in both directions.
 - (b) Assume that edges can only be travelled from lower indexed nodes to larger indexed nodes.
 - (c) Does it matter in general how the nodes are indexed? Explain.
3. George is camped deep in the jungle, and he wants to make his way back to the coast and civilization. Each of the paths he can take through the jungle has obstacles that can delay him, including hostile natives, wild animals, dense forests and vegetation, swamps, rivers and streams, snakes, insects, and mountains. Following is the network of paths that George can take, with the time (in days) to travel each branch:



Determine the shortest (time) path for George to take and indicate the total time. Assume that all edges can be travelled in both directions; you may use either Excel or the Dijkstra algorithm.