CSCI-271 Homework # 10 Solutions

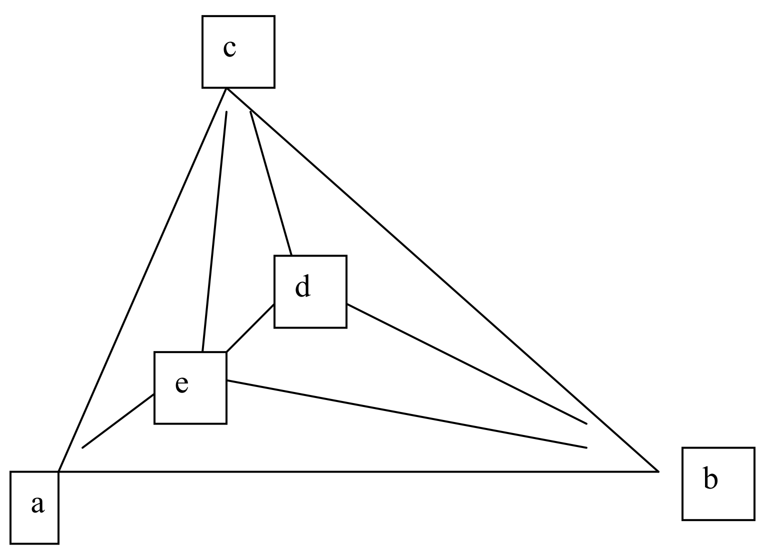
9.5 – 4
The degree of vertex *c* is odd, so this graph as no Euler circuit. One Euler path is *f,a,b,c,d,e,f,b,d,a,e,c*

9.5 – 10
It is possible to cross each bridge once and return to your standing place.

9.5 – 30
This graph can have no Hamiltonian circuit because of the cut edge {*c,f*}. Every simple circuit must be confined to one of the two components that you get by deleting this edge.

9.5 – 32
This graph has the same situation as 8.5-30. In this case, the cut edge is {*e,f*}.

9.6 – 2
The length of the shortest path is 7. This can be determined by applying Dijkstra's algorithm.



One way to draw it is like above, where the vertices have been labeled starting with the lower left and proceeding clockwise around the figure in the problem statement.

9.7 - 6
This graph, when untangled, produces two quadrilaterals that share one edge.

9.7 - 14
Euler's formula says that v – e + r = 2. We are given e = 30 and r = 20. Therefore, v = 2 – r + e = 2 – 20 + 30 = 12

9.8 - 18
Three colors are necessary and sufficient to color the graph made my making stations into vertices and connecting them if they are within 150 miles of each other.