Jakob Roberts – v00484900 – Assignment 5

1.
P[1] => T[1]
P[2] => T[2]
P[1] => T[2]
P[2] => T[3]
P[1] => T[4]
P[2] => T[5]
P[3] => T[6]
P[4] => T[7]
P[5] => T[8]
P[6] => T[9]
P[7] => T[10] **Pattern Match!**
P[1] => T[8]
P[2] => T[9]
P[3] => T[10]
P[4] => T[11]
P[1] => T[11]
P[2] => T[12]
P[3] => T[13]
P[4] => T[14]
P[5] => T[15]
P[6] => T[16]
P[7] => T[17] ** Pattern Match!**
P[1] => T[15]
P[2] => T[16]
P[3] => T[17]
P[4] => T[18]
P[5] => T[19]
P[6] => T[20]
End of String

2.
a) Question: Does there exist a path from s-t in graph G such that there is no path of greater length(sum of the weights)?

b) Output: Number of cliques of size at least k in graph G.

3.
a) Take graph G and let x,y be adjacent to edge E. If either x is in the cover set or y is in the cover set, take vertex of highest degree (base deg minus already covered adjacent edges) and put in cover set. Repeat for all edges.

b) Assuming worst case of G being a complete graph, the smallest size of vertex cover could be would be n-1. Using the definition of a complete graph, all nodes are connected to eachother by an edge, therefore if a single node is not in the cover, all edges to that node are still in the cover. Removing any more nodes from the cover would omit an edge.