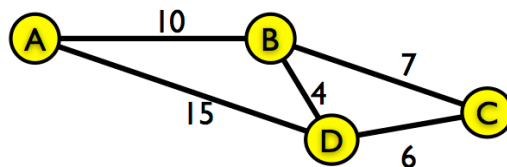# CPSC 433: Lab Exercise 4
Or-Tree-Based Search

Assume we are going to write a program to solve a the traveling salesman problem by or-tree search. The traveling salesman problem is an old problem (1930!) that is very well studied. The problem is this: Given a list of cities and a list of cost/distance/difficulty between connected cities, determine the optimal route a salesman could travel to visit every one of the cites at least once, terminating with the starting city. You will recognize the input to the problem is a weighted graph. The graph, of course, is not necessarily fully connected. For this problem you will consider the arcs in the graph to be bi-directional, that is, that the arcs can be traversed in both directions. Your task is to find an optimal (as measured by minimizing the arc weights) route starting at the start city and terminating with the start city and visiting every city.

Design an or-tree-based model (A=(S,T)) by defining the types and definitions of S, and T, together with any auxiliary definitions as are used in search paradigm. (Your answers may be in text; they do not necessarily have to be in formal notation, although full marks will only be given if the answer includes formal definitions.)

Define your search process P=(A, Env, K) by defining the types and definitions of Env, and K, together with any auxiliary definitions as are used in search paradigm.

Define G, your goal state. Draw the tree that your search process generates for the following problem:

Starting city: A