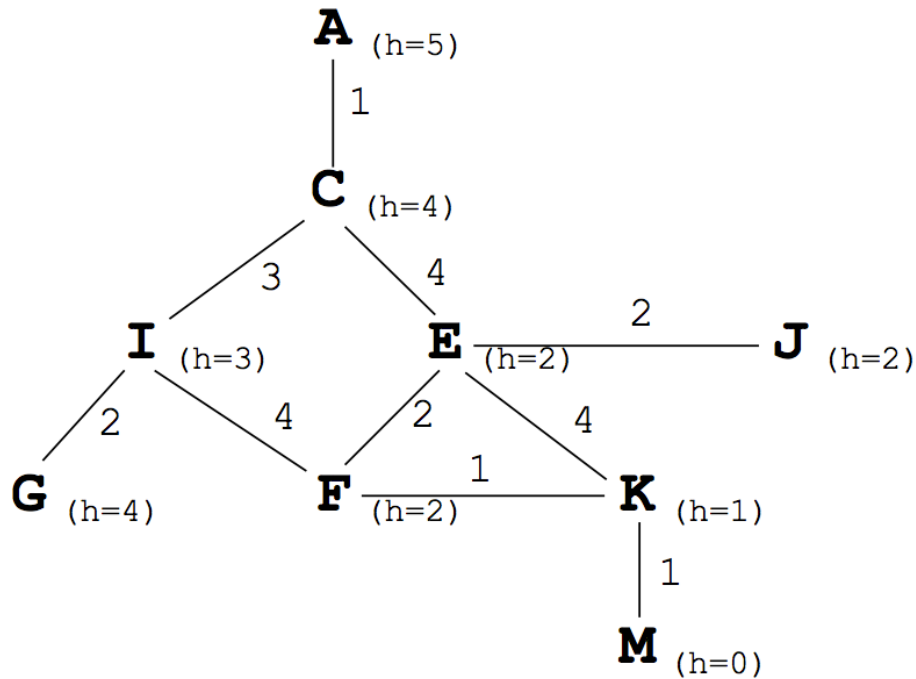# CS 3600 – Introduction to Artificial Intelligence

Practice Search problem

Consider the graph given above. It shows the actual distances between cities on a map. Each city is labeled with an estimate of the distance of the city from city M. Each path from a city to its neighbor is labeled with the length of the path. Consider an informed search for a shortest path from city A to city M using these estimates as heuristic function. Show how a version of A* would find this path. Assume that A* never expands the same state more than once and that it breaks ties toward cities with names earlier in the alphabet (A before B, B before C, and so on). Show the resulting search tree, including the f-value, g-value, and h-value of each node. Also clearly indicate the order in which the nodes are expanded (= label the node expanded first with 1, the node expanded next with 2, and so on - do not forget to label those nodes whose expansion only generates states that have already been expanded).

Search tree: (circled numbers indicate the order of expansion)

(1) A 0+5=5   g+h=f values

(2) C 1+4=5

(4) I 4+3=7   **(3) E** 5+2=7

G 6+4=10   **F** 8+2=10   **(5) F** 7+2=9   **K** 9+1=10   **(6) J** 7+2=9

I   **(7) K** 8+1=9

E   **(8) M** 9+0=9

STOP