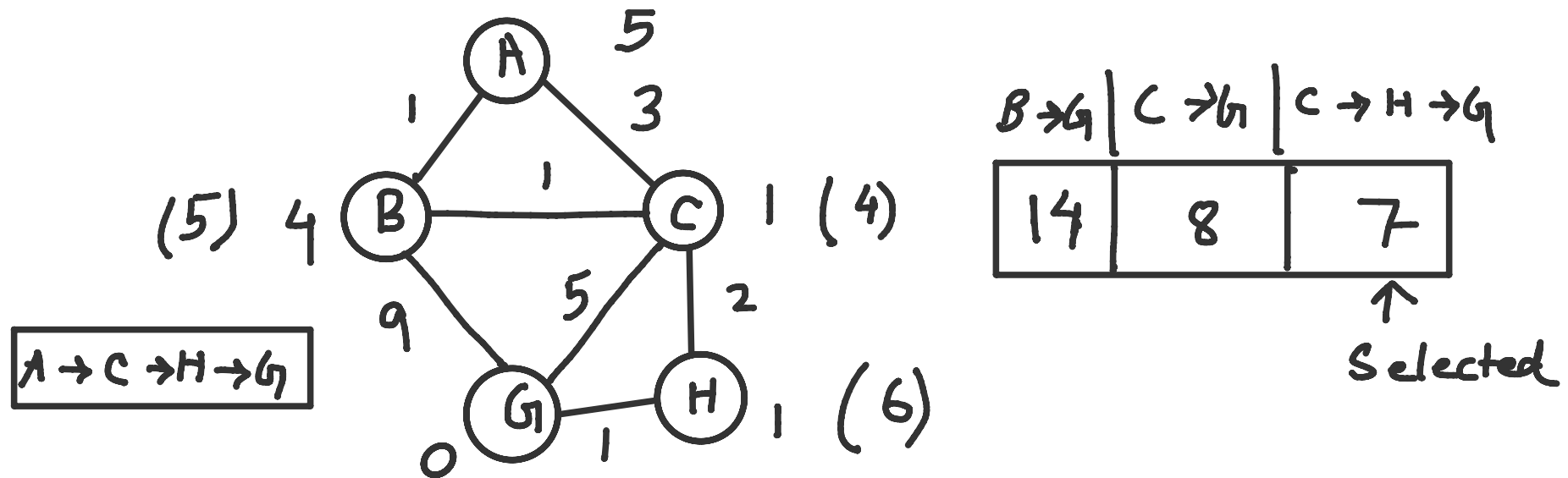


Artificial Intelligence - 1

05 March 2021 10:03

A* Algorithm Tree Traversal



The graph is admissible as,

$$h(n) \leq h^*(n)$$

The graph is not-consistent

$$h(n) \leq c(n, a, n') + h(n')$$

as the above relationship is not satisfied at the below node :-

i) Node C \rightarrow The node C is connected to node A, B, G, H. We detected that the connection between node C and (A, B) is not consistent. This is because

between $A \rightarrow C$, the drop in the heuristic is 4, where as the path cost is 3. Similarly, between connection $B \rightarrow C$, the drop in the heuristic is 3 where as the path cost is 1.

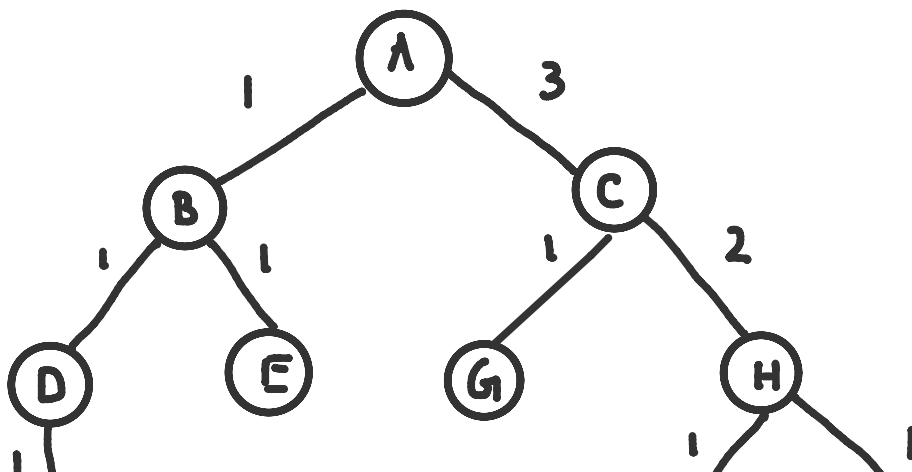
Hence, at the above two connections, the heuristic function is inconsistent.

So, in general,

$$\left. \begin{aligned} |h(C) - h(A)| &> \text{path-cost}(AC) \\ |h(B) - h(C)| &> \text{path-cost}(BC) \end{aligned} \right\} \text{heuristic is not-consistent}$$

Since the heuristic is not consistent, we will not find the shortest path with strictly expanded list.

Tree Search : we will traverse the below tree :



BFS $\rightarrow A B C D E G$

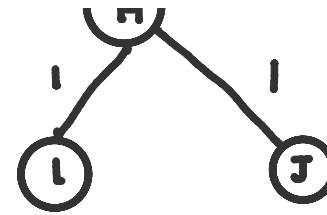
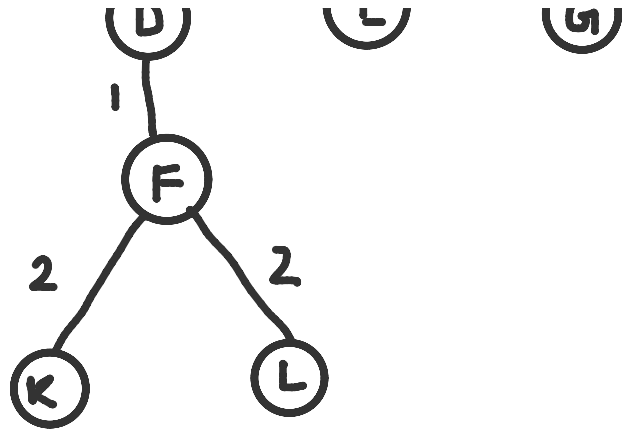
DFS $\rightarrow A B D F K L E C G$

DFID $\rightarrow A$

A B C

A B D E C G

UCS $\rightarrow A B D E C F G$



UCS \rightarrow ABDECFH