

North-Eastern Hill University
Department of Information Technology
B.Tech Mid-Term Examination [Feb-July 2018]
Artificial Intelligence (IT-634)

Time: 1 Hour

Full Marks: 30

Answer any three questions

- 1) What is Artificial Intelligence? What are the different types of AI problems (give an example of each)? What is a State Space representation of a problem (explain with an example) ? Write down the four components of a Production System. (1+2+4+3)
- 2) Explain the strengths of Steepest Ascent Hill Climbing Algorithm over Simple Hill Climbing with the help of an example. Also, explain the need for the Simulated Annealing algorithm [hint: explain it with the help of the two-dimensional “State vs Heuristic value” diagram.] (4+6)
- 3) Explain Best-First Search Algorithm. Given The following diagram, use A* algorithm to determine the following:

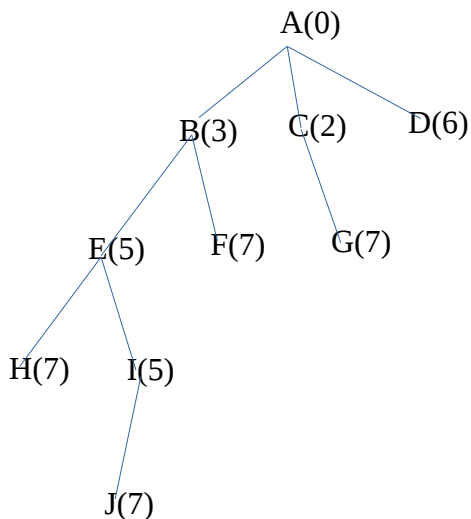


Fig 1

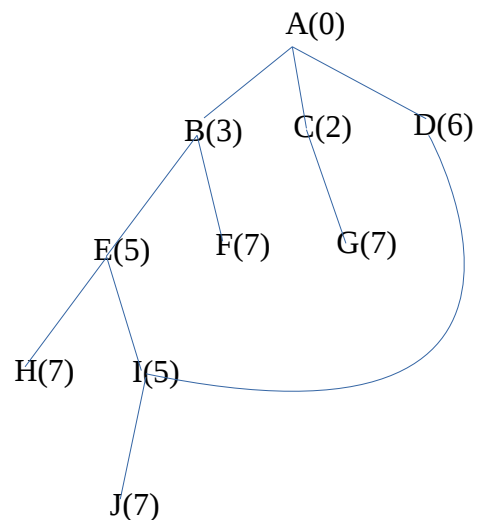


Fig 2

The value in the brackets for each node is the h' (heuristic value), The cost of one arc is 1.

h' = estimated cost to get from current state to goal state

g = cost of getting from initial state to current state

What is the f' and parent link of node “I” and “J” in Fig 1?

Given that we have just expanded node “D” (as shown in Fig 2), will the f' and parent link of node “I” change and if so, what are their new values? What happens to the values of node “J”? (4+2+4)

- 4) Write down the algorithms for Breadth-First Search(BFS) and preorder Depth-First Search (DFS). Give one advantage of BFS and DFS each. (8+2)