



SNS COLLEGE OF ENGINEERING



Kurumbapalayam (Po), Coimbatore - 641 107

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE NAME : 19CS507- Artificial Intelligence

III YEAR /V SEMESTER

Unit 1- INTRODUCTION

Topic 9 : Heuristic Search.



| Heuristic Search

- ◆ We address the problem by using heuristic search

- ◆ Define a search space:
 - nodes are possible structures
 - edges denote adjacency of structures
- ◆ Traverse this space looking for high-scoring structures

Search techniques:

- Greedy hill-climbing
- Best first search
- Simulated Annealing



Hill Climbing

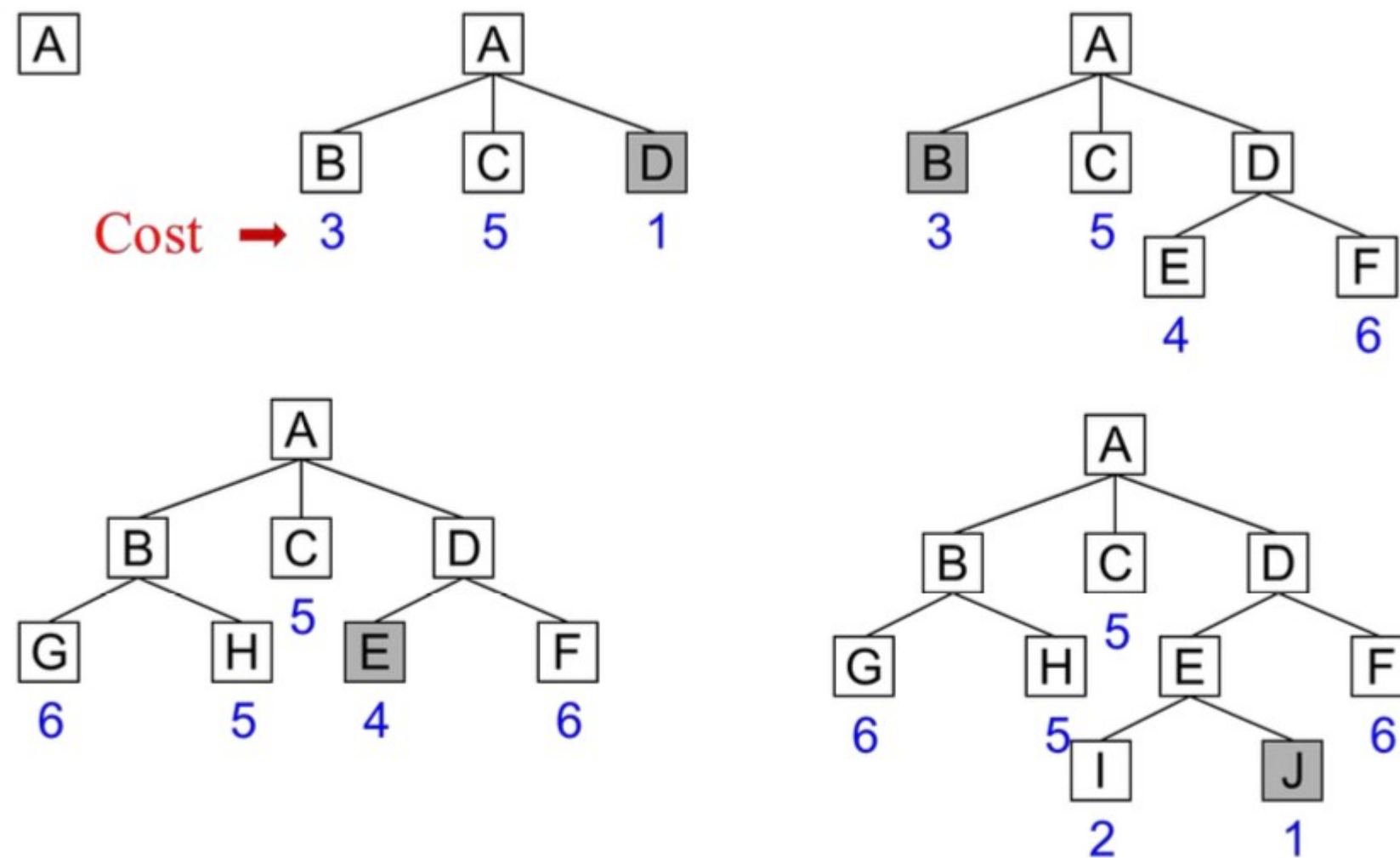
- Is a variant of generate-and test in which feedback from the test procedure is used to help the generator decide which direction to move in search space.
- The test function is augmented with a heuristic function that provides an estimate of how close a given state is to the goal state.
- Computation of heuristic function can be done with negligible amount of computation.
- Hill climbing is often used when a good heuristic function is available for evaluating states but when no other useful knowledge is available.



The Heuristic Function h

- If h is a **perfect estimator** of the true cost then A^* will always pick the correct successor with no search.
- If h is **admissible**, A^* with TREE-SEARCH is guaranteed to give the optimal solution.
- If h is **consistent**, too, then GRAPH-SEARCH is optimal.
- If h is not admissible, no guarantees, but it can work well if h is not often greater than the true cost.

Best First Search is to use an **evaluation function to decide which adjacent is most promising and then explore**. Best First Search falls under the category of Heuristic Search or Informed Search





REFERENCES

1. S. Russell and P. Norvig, "Artificial Intelligence: A Modern Approach, Prentice Hall, Third Edition, 2009.

THANK YOU