## CS-208:Artificial Intelligence Lectures-07 Properties of Search Methods

## **Properties of Search Methods**

Five Important Properties of Search Methods:

 a. Complexity: It is useful to describe how efficient that a search method is over time and space.

<u>Time Complexity of a search method</u> is related to the length of time the search method would take to find a goal node

Space Complexity of a search method is related to the amount of memory need to use

BFS time complexity O(b<sup>d</sup>) where, b is the Branching factor and d is the depth in which the goal node appears in the problem tree

- b. Completeness: A search method is described as being complete, if it is guaranteed to find a goal state if one exist.
  BFS is complete and where as DFS is not complete
- c. Optimality: A search method is optimal if it is guaranteed to find the best solution that exist that is it will find a path to a good solution by taking the least number of steps
- d. Admissibility: A search method is admissible if it is guaranteed to find the best solution in the quickest possible time.
- e. Irrevocability:
  - A search method that use backtracking are described as tentative for example DFS
  - A search method that do not use backtracking and which examine just one path are described as irrevocable for example Hill climbing.