**Experiment 03(a): Uninformed Search**

**Learning Objective:** Student should be able to solve a given problem using uninformed search technique.

**Tools:** Python under Windows or Linux environment/Online Platform

**Theory:** Study and implement DLS or DFIDS Uninformed Search techniques.

**Depth Limited Search:** Depth First Search has some desirable properties as space, but if wrong branch expanded with no solution on it, then it may not terminate. Thus introduce depth limit on branches to be expanded. Hence not expanding a branch below this depth. Hence DLS will always terminate with solution if one exists in the limit. Too small bound misses on the solution and too large bound may find poor solution when there are better ones.

Eg. Romania Problem – Only 20 cities on the map, so no path longer than 19.

**Depth First Iterative Deepening Search:** Choosing depth bound provides incomplete solution or admits poor solution. This variation is complete and finds best solution.

**ALGORITHM:** (for selected search technique)

**ADVANTAGES:**

1. …………………………………………………………………………………..
2. …………………………………………………………………………………..

**DISADVANTAGES:**

1. …………………………………………………………………………………..
2. …………………………………………………………………………………..

**PROPERTIES:**

**Complete:** ………………………………………………………………………………………….

**Time:** ……………………………………………………………………………………………….

**Space:** ……………………………………………………………………………………………...

**Optimal:** …………………………………………………………………………………………...

**APPLICATIONS:**

1. ……………………...…………………………………………………………..
2. ……………………...…………………………………………………………..

**Design:** ………………………………………………………………………

**Experiment 03(b): Informed Search**

**Learning Objective:** Student should be able to solve a given problem using Informed search technique.

**Tools:** Python under Windows or Linux environment/Online Platform

**Theory:** Study and implement Best First Search or A\* search under Informed Search techniques.

**ALGORITHM:** (for selected search technique)

**ADVANTAGES:**

1. …………………………………………………………………………………..
2. …………………………………………………………………………………..

**DISADVANTAGES:**

1. …………………………………………………………………………………..
2. …………………………………………………………………………………..

**PROPERTIES:**

**Complete:** ………………………………………………………………………………………….

**Time:** ……………………………………………………………………………………………….

**Space:** ……………………………………………………………………………………………...

**Optimal:** …………………………………………………………………………………………...

**APPLICATIONS:**

1. ……………………...…………………………………………………………..
2. ……………………...…………………………………………………………..

**Design:** ………………………………………………………………………

**Result and discussion:**  …………………………………………………………………

**Learning Outcomes:** Students should have the ability to

LO1: identify a problem which can be solved using uninformed search methods.

LO2: implement uninformed search methods.

LO3: describe properties of uninformed search algorithm.

LO4: identify advantage and disadvantage of the algorithm.

**Course Outcomes:** Upon completion of the course students will be able to evaluate various problem solving methods for an agent to find a sequence of actions to reach the goal state.

**Conclusion:** ………………………………………………………………………………………

**Viva Questions:**

1. Describe the structure of a search space in which iterative deepening search performs much worse than DFS.
2. Name which algorithm overcomes drawback of DFS and BFS?
3. Compare and contrast uninformed search strategies with respect to solving 8 puzzle problem.

For Faculty Use

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Correction Parameters** | **Formative Assessment [40%]** | **Timely completion of Practical [ 40%]** | **Attendance / Learning Attitude [20%]** |  |
| **Marks Obtained** |  |  |  |