**PSG COLLEGE OF TECHNOLOGY**

**DEPARTMENT OF APPLIED MATHEMATICS AND COMPUTATIONAL SCIENCES**

**M.Sc (SS) – 18XW67-ARTIFICIAL INTELLIGENCE LAB**

**PROBLEM SHEET-I**

1. Write a program to perform the following searching strategies:
   1. Depth First Search
   2. Breadth First Search
   3. Depth Limited search
   4. Iterative Deepening Search
2. Implement the following heuristic search algorithms
   1. A\* algorithm
   2. Hill Climbing
3. Implement Hill Climbing algorithm for 8 puzzle problem. The problem is defined as follows:

Consider a 3-by-3 grid with 8 square blocks labelled 1 through 8 and a blank square. Your goal is to rearrange the blocks so that they are in order. You are permitted to slide blocks horizontally or vertically into the blank square. The following shows a sequence of legal moves from an initial board position (left) to the goal position (right). The state space is the specification of each of the eight tiles in the nine squares (the blank is in the remaining square).

# Start State Goal State

 

State space={7,2,4,5,0,6,8,3,1} State Space={0,1,2,3,4,5,6,7,8}

4. Implement A\* algorithm for Missionaries and Cannibals problem. The problem is defined as follows:

On one bank of a river are three missionaries and three cannibals. There is one boat available that can hold up to two people and that they would like to use to cross the river. If the cannibals ever outnumber the missionaries on either of the river’s banks, the missionaries will get eaten. How can the boat be used to safely carry all the missionaries and cannibals across the river?

(CanLeft, MissLeft, BoatPos, CanRight, MissRight)

For example,(2, 2, RIGHT, 1, 1)indicates 2 cannibals and 2 missionaries on the left bank of the river, the boat is on the right side, together with 1 cannibal and 1 missionary. A legal move is one which involves moving up to two people to the opposite bank, (such that cannibals don't outnumber missionaries on either bank)