NAME OF STUDENT:		CLASS:
SEMESTER/YEAR:		ROLL NO:
DATE OF PERFORMANCE:	DATE OF SUBMISSION:	
EXAMINED BY:	EXPERIMENT NO: 02	

TITLE: IMPLEMENT A STAR ALGORITHM FOR 8 PUZZLE PROBLEM

PROBLEM STATEMENT: To solve 8-puzzle problem using A* algorithm. Assume any initial configuration and define goal configuration clearly.

OBJECTIVES:

1. To understand, what is state space search and its importance.
2. To understand the implementation of A* algorithm.

PRE-REQUISITES:

Node:

> The process of plotting an efficiently traversable path between multiple points, called Nodes.

Edges:

> All the nodes are arranged in a *graph* where links between nodes represent valid steps in solving the problem. These links are known as *edges.*

State space search:

> It is solving a problem by beginning with the start state, and then for each node we expand all the nodes beneath it in the graph by applying all the possible moves that can be made at each point.

Heuristics Algorithm and cost:

> Heuristic function to solve 8-puzzle problem and it's cost function.

THEORY:
8 PUZZLE PROBLEM:

The puzzle is divided into sqrt(N+1) rows and sqrt(N+1) columns. E. g. 15-Puzzle will have 4 rows and 4 columns and an 8-Puzzle will have 3 rows and 3 columns. The puzzle consists of N tiles and one empty space where the tiles can be moved. Start and Goal configurations (also called state) of the puzzle are provided.

  The objective is to place the numbers on tiles to match final configuration using the empty space. We can slide four adjacent (left, right, above and below) tiles into the empty space.

QUESTIONS:

1. Compare Informed search with Uninformed Search.
2. What is a heuristic function? Explain with an example.
3. How calculate h-score.
4. Under what situations, would the following search algorithms, be most appropriate? (Give examples)
    1. Depth First Search
    2. Breadth First Search
    3. Best First Search