Sorting Puzzle Game Using A* Algorithm

AI Laboratory

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Done by

Harshini S - 18Z320

Iswaryaa GP - 18Z323

Janani R - 18Z324

Suvalakshmi B - 18Z359

Problem Statement:

The main objective of our project is to develop a sorting puzzle game, where the alike objects will be sorted in an optimal way using the A* search algorithm.

A* Algorithm:

A* algorithm is a searching algorithm that searches for the shortest path between the initial and the final state. A* algorithm is used in various applications such as maps, puzzle games, etc. A* algorithm is one of the best techniques widely used in path planning tasks and optimal graph traversals. It works by keeping track of all the visited nodes and stores them in memory and ignores the nodes that are already visited, which will save a huge amount of time. It also has a list of nodes that are yet to be explored and it chooses the optimal node from the list, thus saving time by not exploring the unnecessary and less optimal nodes.

A* algorithm in the puzzle game:

A puzzle game has an initial state and a final state. The initial state for a puzzle game will be a random state and the final state will be the sorted state. There are many possible ways to reach the final state from the initial state. Finding the optimal way among the existing solutions will save time and increase the score of the player. A* algorithm helps in searching the optimal solution from the initial state to the final sorted state.

Sorting Puzzle Game using A* algorithm:

A sorting puzzle game is a game where the player sorts the alike objects in the same column. Objects at the top of the column can be shifted to other columns only if the same kind of object is on the top of the destination column and also there is space to accommodate the same object in the destination column. The player wins when all the similar objects are arranged in the same column.

The A* method helps in choosing the optimal object to be shifted from the list of objects at the top of each column so that the final state can be reached earlier. It saves time and increases the score of the player. The A* method also helps in choosing the optimal column to which the object has to be moved when there is more than one option. In this way, an optimal solution to the sorting game in terms of time and number of moves can be achieved.