AI Lab 1 report

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Path to goal & it's cost:

1. Get the initial state of the scenario .
2. Find the available moves and their cost.
3. Choose the move with the least cost and set it as the current state.
4. Check if it matches the goal state, if yes terminate, if no repeat from step 1.

We have a function called construct_path that prints the path,

In the **DFS** , more movements might be made which does not always send us closer to the objective, but rather further away. Whatever the initial state, the DFS searches down the leftmost route from the root. with this method, an answer node might take longer be discovered.

. When a node is visited ,it is marked as visited, if it is the goal state then return , if not , then operate on this node.

In **BFS** , It always locates the goal state that is closest to the root**.** However, the algorithm tries the same series of movements as DFS regardless of the initial state.

.Initialize queue with starting node, pop the first visited node if it is the goal then return , else operate on each node accessible from the visited node.

In **A***, it uses admissible heuristics which is optimal as it never over-estimates the path to goal. It's carried on using a priority queue.

1. Place the initial node into priority queue and find its f (n) value.

2. Remove the node from priority queue, having the smallest f (n) value. If it is a goal node, then stop and return to success, else remove the node from priority queue, and find all its successors.

Find the f (n) value of all the successors, place them into priority queue, and place the removed node into the visited nodes. If the goal state is achieved then exit, else go to (2)

To get the cost:

F(X) = g(X) + h(X) where

g(X) = cost of reaching the current node from the root

h(X) = cost of reaching an answer node from X.

Running time :

The running time of each algorithm is calculated and printed ,

BFS finds the solution I less movements than the DFS but the A* algorithm is more efficient than both of them and may find a solution in less movements than the BFS.