ALGORITHMS Assignment Report

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Assignment 1: Graph problem

a) Graph data structures was represent as:
the a DICTIONARY (JSON like object):

```
{
  pointID : { Boolean indicator for inform that is a
              Blocked Brick  // Path Space}
,
pointID : { Boolean indicator for inform that is a
              Blocked Brick  // Path Space}
, …

}
```

Point ID was the numbered position from right to left side ,
and top to bottom line of the text based graph.

b) The graph from the input was constructed by:
Analyzing node connection levels : counting up the level by add free space within that Point neighbours in 4 directions.
(UP, DOWN, LEFT, RIGHT).

c) The algorithms used to fulfill the project requirement:
The Djikstra Algorithm was implemented to follow all possible paths,
and detect the lowest cost path one.

Assignment 2: Tic-tac-toe

a) How do you represent a state:

A state was represented is a full map of game board ,
with indicator that target the turn belong to which player.
The possibilities for next move will be made.
Plus
The Game END indicator, depend on who is the first player.
(may be a TIE game)

We have the State SPACE is:
3 power (9) == 19683 states possibles.

We need to checking the Winning condition for the game, following the player turns:

+ Verify these exist line of HORIZONTAL , VERTICAL, 2 SIDES DIAGONALS .
+ Who is the Winner

b) How do you evaluate the static score of a state:

The metrics to score a state are finding :

+ the best possible move for a given node situation .

(correct to the Children states below this State)

+ the State depth. (Shorter is better == player can win faster.)

c) The strategy to choose the next move was Mini - Max heuristic algorithm , having:

- Max() : # Player 'O' is max, in this case AI
- Min() : # Player 'X' is min, in this case human