Contents

A star Planning

```
A-start is used to find the shortest distance between the start and the goal.
The heuristic used to evaluate the shortest distances in A* is:
 *f(n) = g(n) + h(n)*
```

```
h(n) is the euclidean distance between the point of interest and the goal
g(n) is defined as the cost of moving from the start point to the current position
f(n) is the total distance, i.e., the sum of G and H
```
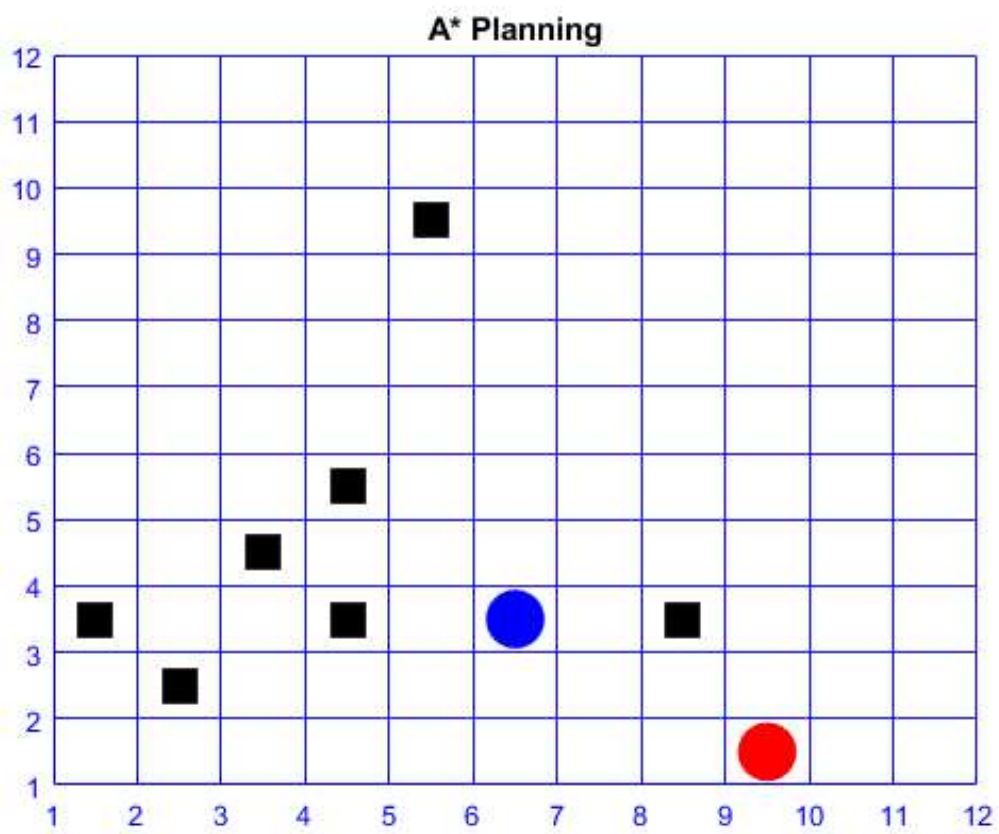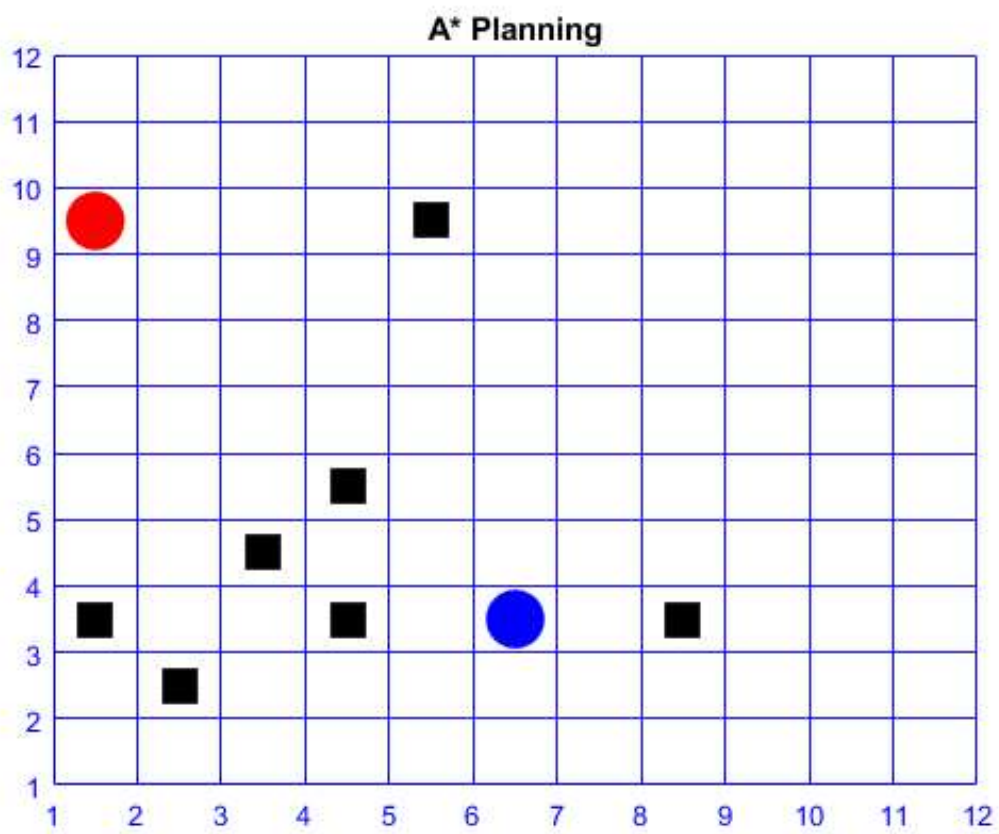
Demo :<https://www.youtube.com/watch?v=CFD1cfQcOWU>

A* Pseudocode

Step 1: Initialization of the Values

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Step 2 : Create two lists

Step 4 Set H value based on the distance

Step 5 Moving the start point to closedList

Step 6a. Find the next positions to be opened (Checking if they are already reached or if they are blocked)

Step 6b. Based on the previous step, move the suitable points to the openList

Step 7a Find the lowest F value for the points in the openList

Step 7b Choose the above as the next position

Move this point to the closedList and if this is equivalent to the goal, then terminate

Display the F, G and H value

```
FGHValue =

    'G:0  H:7.8102  F:7.8102'


FGHValue =

    'G:1  H:7.2111  F:8.2111'


FGHValue =

    'G:1  H:8.6023  F:9.6023'


FGHValue =

    'G:1  H:7.0711  F:8.0711'


FGHValue =

    'G:2  H:6.4031  F:8.4031'


FGHValue =

    'G:2  H:6.4031  F:8.4031'


FGHValue =

    'G:2  H:6.7082  F:8.7082'


FGHValue =

    'G:2  H:8.0623  F:10.0623'


FGHValue =
```

```
    'G:3  H:5.831  F:8.831'


FGHValue =

    'G:3  H:5.6569  F:8.6569'


FGHValue =

    'G:3  H:5.831  F:8.831'


FGHValue =

    'G:4  H:5  F:9'


FGHValue =

    'G:4  H:5  F:9'


FGHValue =

    'G:3  H:6.3246  F:9.3246'


FGHValue =

    'G:3  H:7.6158  F:10.6158'


FGHValue =

    'G:4  H:5.3852  F:9.3852'


FGHValue =

    'G:4  H:5.3852  F:9.3852'


FGHValue =

    'G:5  H:4.4721  F:9.4721'


FGHValue =

    'G:5  H:4.2426  F:9.2426'


FGHValue =

    'G:5  H:4.4721  F:9.4721'
```

```
FGHValue =

    'G:6   H:3.6056   F:9.6056'


FGHValue =

    'G:6   H:3.6056   F:9.6056'


FGHValue =

    'G:4   H:7.2801   F:11.2801'


FGHValue =

    'G:5   H:5.099   F:10.099'


FGHValue =

    'G:5   H:5.099   F:10.099'


FGHValue =

    'G:6   H:4.1231   F:10.1231'


FGHValue =

    'G:6   H:4.1231   F:10.1231'


FGHValue =

    'G:2   H:9.434   F:11.434'


FGHValue =

    'G:7   H:3.1623   F:10.1623'


FGHValue =

    'G:3   H:8.9443   F:11.9443'


FGHValue =

    'G:6   H:5   F:11'


FGHValue =
```

```
    'G:7  H:4  F:11'


FGHValue =

    'G:7  H:4  F:11'


FGHValue =

    'G:8  H:3  F:11'


FGHValue =

    'G:8  H:2.2361  F:10.2361'


FGHValue =

    'G:9  H:2  F:11'


FGHValue =

    'G:9  H:1.4142  F:10.4142'


FGHValue =

    'G:10  H:1  F:11'


FGHValue =

    'G:10  H:2.2361  F:12.2361'


FGHValue =

    'G:10  H:1  F:11'


FGHValue =

    'G:4  H:8.544  F:12.544'


FGHValue =

    'G:7  H:5.099  F:12.099'


FGHValue =

    'G:7  H:6  F:13'
```

```
FGHValue =

    'G:8  H:4.1231  F:12.1231'


FGHValue =

    'G:8  H:3  F:11'


FGHValue =

    'G:9  H:3.1623  F:12.1623'


FGHValue =

    'G:10  H:2.2361  F:12.2361'


FGHValue =

    'G:11  H:1.4142  F:12.4142'


FGHValue =

    'G:11  H:0  F:11'


FGHValue =

    'G:11  H:1.4142  F:12.4142'


FGHValue =

    'G:9  H:3.1623  F:12.1623'
```
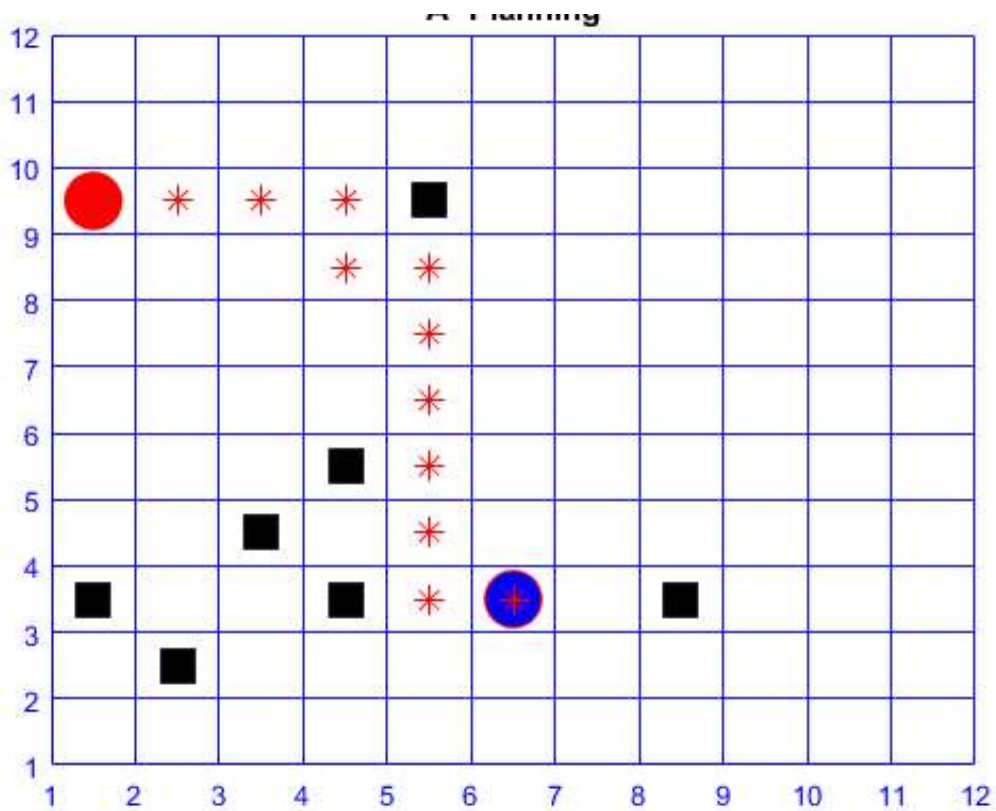
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```
FGHValue =

    'G:0  H:3.6056  F:3.6056'


FGHValue =

    'G:1  H:4.4721  F:5.4721'


FGHValue =

    'G:1  H:2.8284  F:3.8284'


FGHValue =

    'G:1  H:3.1623  F:4.1623'


FGHValue =

    'G:2  H:2.2361  F:4.2361'


FGHValue =

    'G:2  H:2.2361  F:4.2361'


FGHValue =
```

```
FGHValue =

    'G:2  H:4.1231  F:6.1231'


FGHValue =

    'G:2  H:3  F:5'


FGHValue =

    'G:3  H:2  F:5'


FGHValue =

    'G:3  H:1.4142  F:4.4142'


FGHValue =

    'G:4  H:1  F:5'


FGHValue =

    'G:4  H:1  F:5'


FGHValue =

    'G:3  H:4  F:7'


FGHValue =

    'G:3  H:3.1623  F:6.1623'


FGHValue =

    'G:4  H:2.2361  F:6.2361'


FGHValue =

    'G:5  H:1.4142  F:6.4142'


FGHValue =

    'G:5  H:0  F:5'


FGHValue =

    'G:5  H:1.4142  F:6.4142'
```

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