CS312: Lab-1

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Note: The Preference order of Down > Up > Right > Left (DURL) is followed throughout the code.

Code Explanation

isValid :- This function will check if the given position is valid or not for the grid.

PathFind:- This function traces the original path taken from the start position to the position of the food.

bfs :- Implementation of the Breadth first search.

dfs :- Implementation of Depth first search.

dfid :- Check if the food is present in the limit given.

dfid_unil:- find the min_limit where we can find the food.

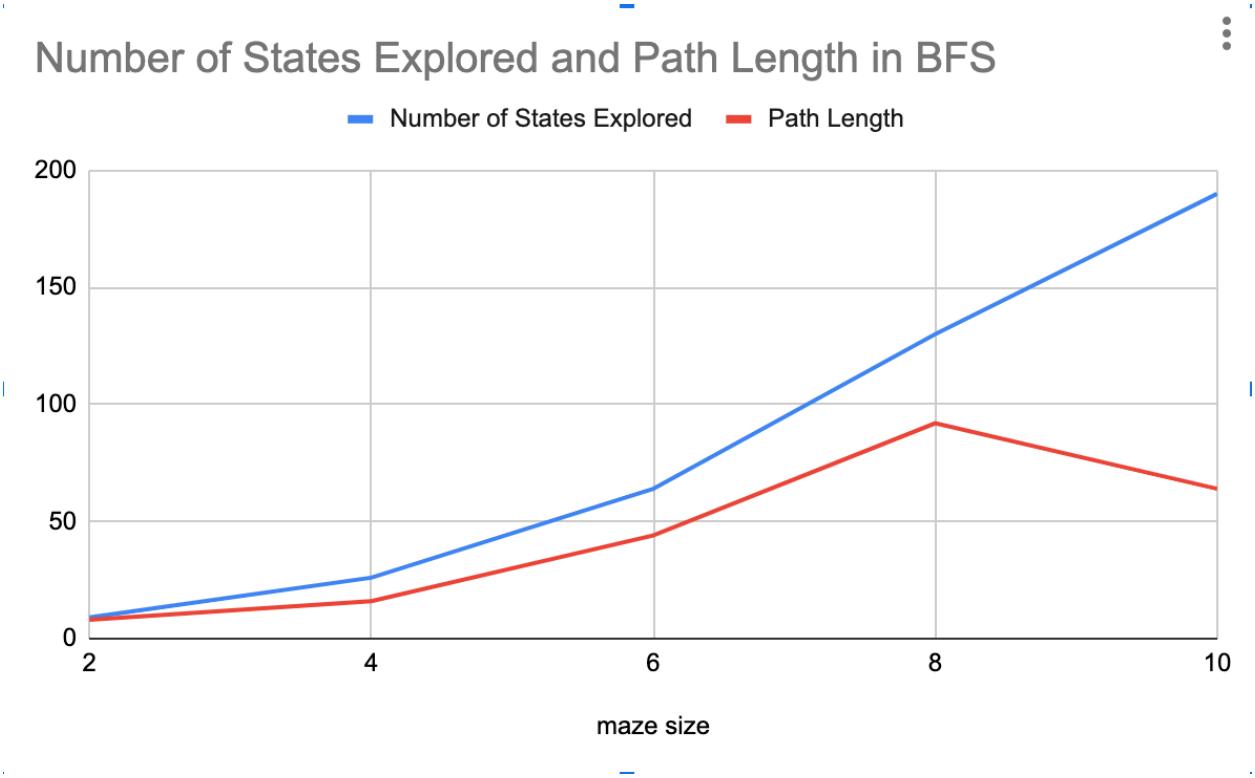
Results

Algorithms	**Order Follow: Down > Up > Right > Left**			
	Horizontal Cell	**Vertical Cell**	**No. of State Explored**	**Path Length**
BFS	**2**	**2**	**9**	**8**

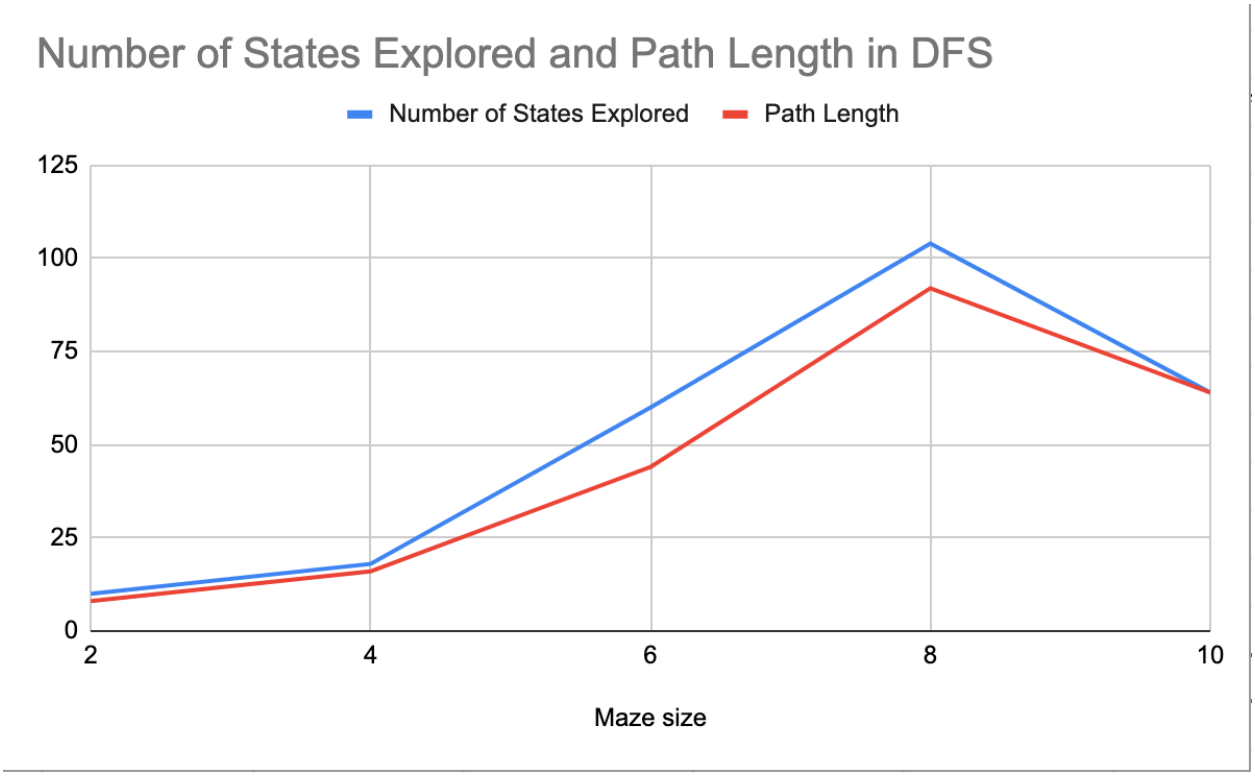
Algorithms	Order Follow: Down > Up > Right > Left			
	Horizontal Cell	Vertical Cell	No. of State Explored	Path Length
DFS	2	2	10	8
DFID	2	2	28	8
BFS	4	4	26	16
DFS	4	4	18	16
DFID	4	4	152	16
BFS	6	6	64	44
DFS	6	6	60	44
DFID	6	6	1321	44
BFS	8	8	130	92
DFS	8	8	104	92
DFID	8	8	5306	92
BFS	10	10	190	64
DFS	10	10	64	64
DFID	10	10	5148	64

Plots

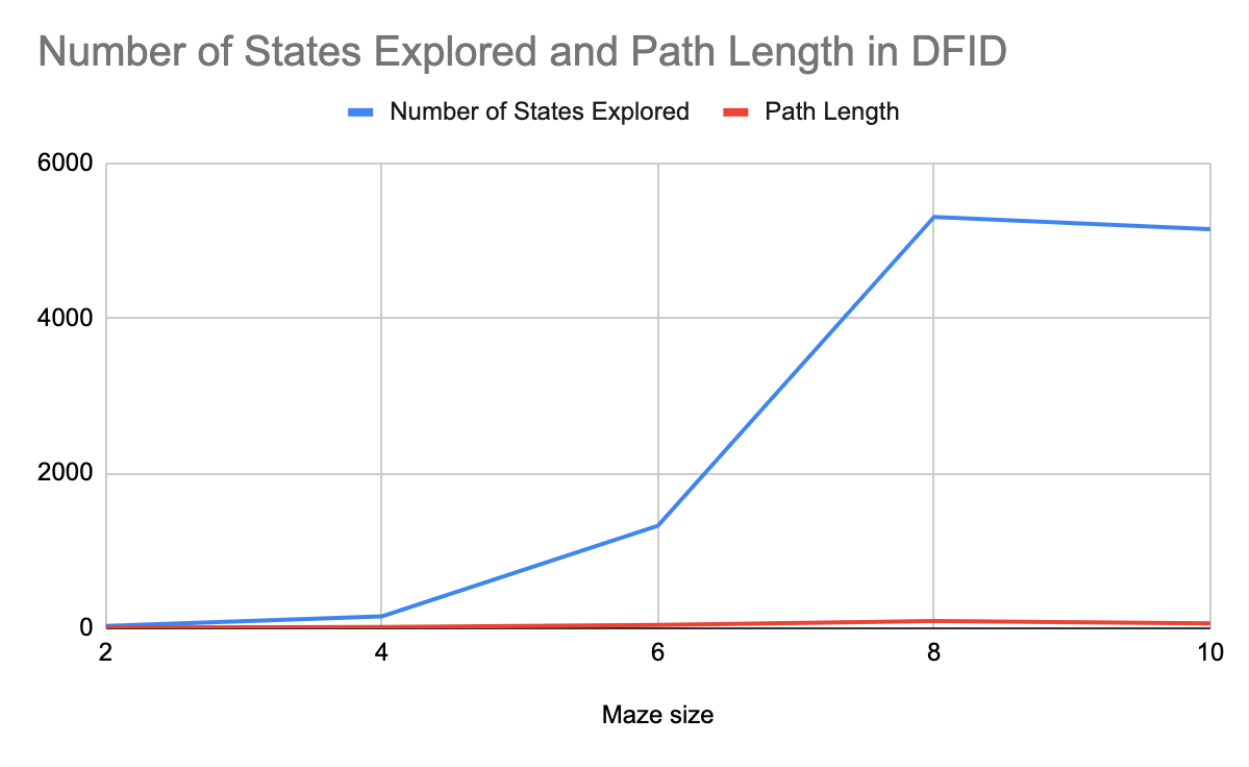
1)BFS Plot



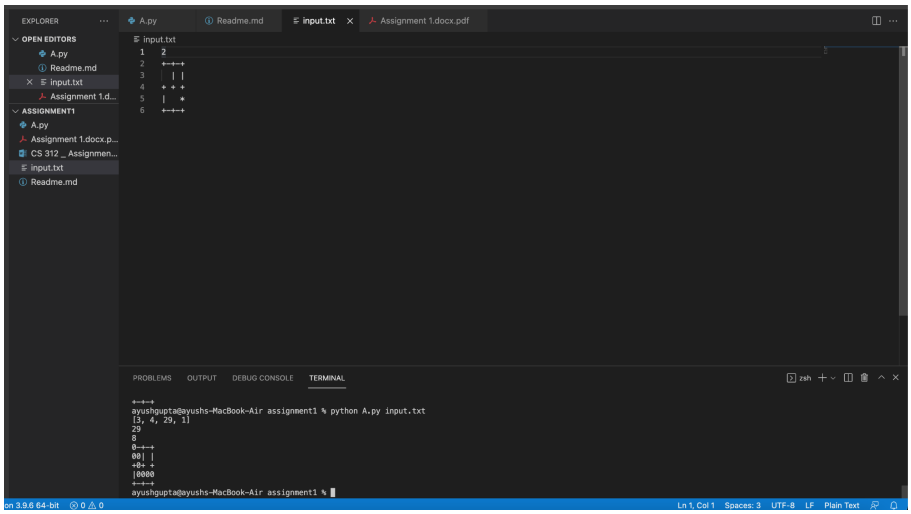
2)DFS Plot



3)DFID Plot


Number of States Explored and Path Length in DFID
Number of States Explored
Path Length
6000
4000
2000
0
2
4
6
8
10
Maze size

Snapshots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input.txt
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Assignment 1.docx.p...
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input.txt
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input.txt
1 2
2 +-+-+
3 | |
4 + + +
5 | *
6 +-+-+
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
zsh
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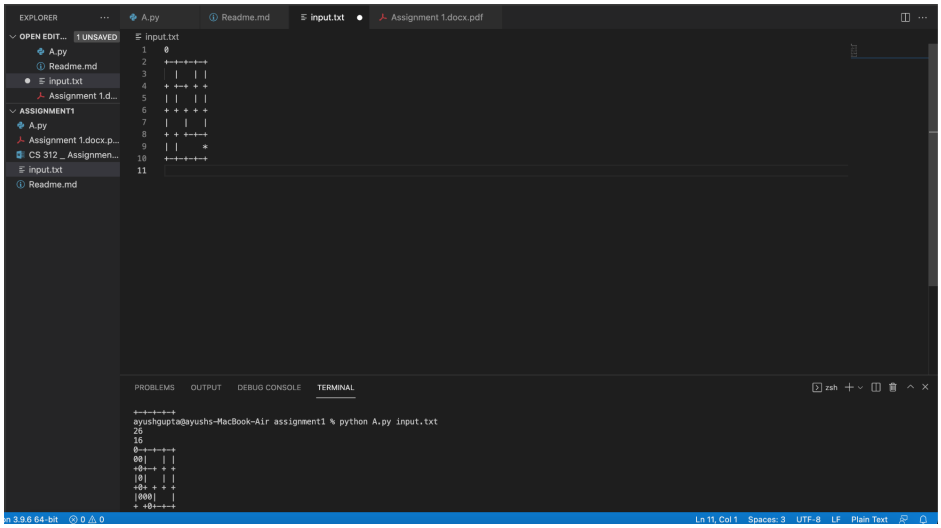
ayushgupta@ayushs-MacBook-Air assignment1 % python A.py input.txt
[3, 4, 29, 1]
29
8
0+-+-+
00| |
+0+ +
|0000
+-+-+
ayushgupta@ayushs-MacBook-Air assignment1 %
on 3.9.6 64-bit
Ln 1, Col 1
Spaces: 3
UTF-8
LF
Plain Text


EXPLORER
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A.py
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Assignment 1.docx.pdf
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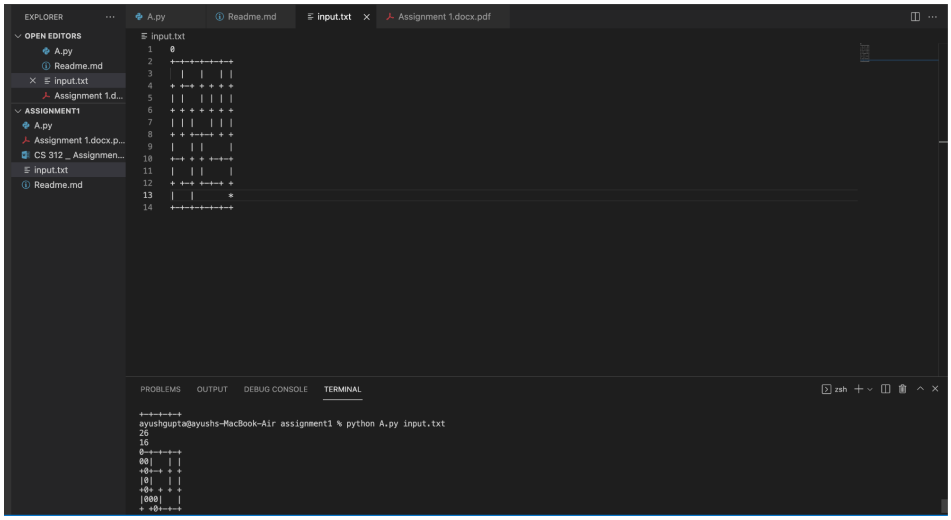
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
zsh
ayushgupta@ayushs-MacBook-Air assignment1 % python A.py input.txt
26
16
Ln 11, Col 1
Spaces: 3
UTF-8
LF
Plain Text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PROBLEMS
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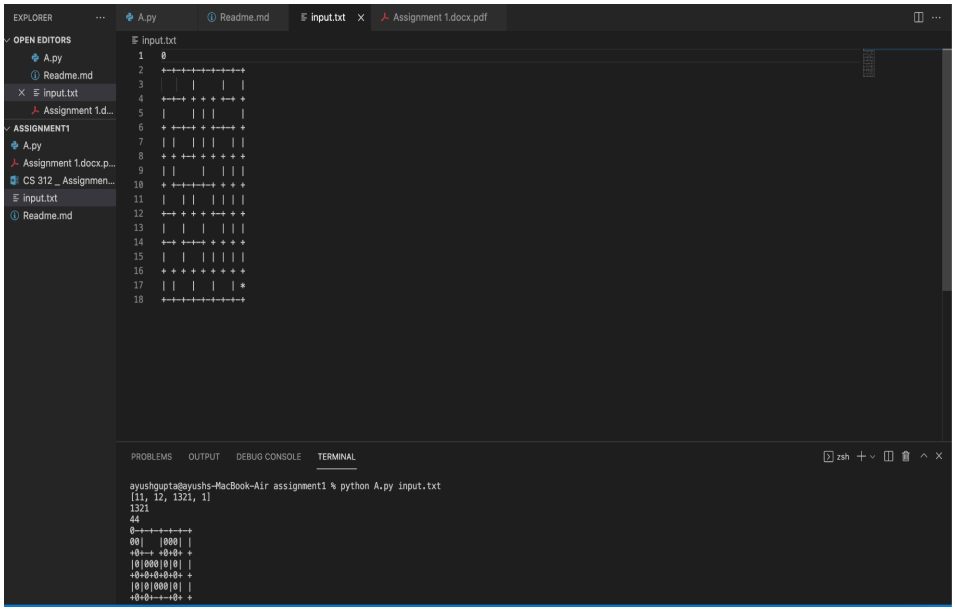
zsh
ayushgupta@ayushs-MacBook-Air assignment1 % python A.py input.txt
25
16


EXPLORER
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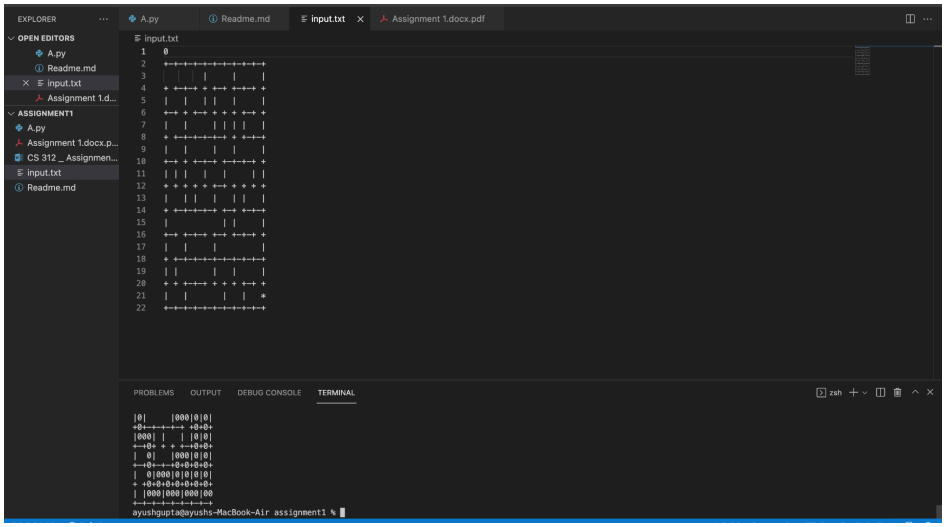
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
zsh
ayushgupta@ayushs-MacBook-Air assignment1 % python A.py input.txt
[11, 12, 1321, 1]
1321
44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PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
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Conclusion

The conclusion which we come across is from the graphs we plot is as follows:-

- In the DFS, BFS and DFID number of states and path length vary as food position and grid size varies.
- No. of states in DFID is much larger than DFS and BFS even the path length and grid size are the same.
- For some cases, it was observed that the number of states and path lengths were the same due to the location of the food in the grid.