ARTIFICIAL INTELLIGENCE LAB

ASSIGNMENT-1: DFS, BFS

(Read all the instructions carefully & adhere to them.)

Date: 11th March 2024,

Total Credit: 10 (Implementation: 5; Documentation & Explanation: 5)

Instructions:

- Markings will be based on the correctness and soundness of the outputs.
- Marks will be deducted in case of plagiarism.
- Proper indentation and appropriate comments are mandatory.
- Comments/explanations/intuitions should be provided in a separate text/word document, not the code file.
- You should zip all the required files and name the zip file as roll_no_of_all_group_members .zip, e.g., 1501cs11_1201cs03_1621cs05.zip.
- Upload your assignment as a ZIP file to the following Dropbox link: https://www.dropbox.com/request/fHGGkylu07No1ptA1wsX

For any queries regarding this assignment, you can contact:

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Problem Definition:

- The task is to check if we can reach from any random start grid to the mentioned target grid by moving the Blank space ('B').
- In one step, the Blank space can move either top, down, left, or right.

Input:

Generate a random grid of 3×3 shape containing numbers from 1 to 8 and a blank space. The target grid is fixed. For example,

Initial State (Sample)				Target State (Fixed)		
3	2	1		1	2	3
4	5	6		4	5	6
8	7	B		7	8	B

Questions:

1. Compare the Breadth First Search(BFS) and Depth First Search(DFS) with respect to the number of steps required to reach the solution and whether they are reachable. If unreachable, start with a random state and retry until the Target State (given above) is reached.
2. Comment on which algorithm will be faster and when by mentioning proper intuition and examples