Name: Chayan Kumar Patodi
Source Code: Project1_ChayanPatodi.py

To Run the file in Linux Terminal:

1 Open the Terminal in the directory where the Source Code is Saved.
2. Type the command: **python3 Project1_ChayanPatodi.py**
3. It will ask for an input matrix, which is to be given by the user. The values should be b/w 0-8 and should be given in a way:

1 2 3
4 5 6
7 0 8

```
( 1 space 2 space 3 space , press enter
  4 space 5 space 6 space , press enter
  7 space 0 space 8 space , press enter)
```

4. Once you give the input matrix, it will start the computation.
5. Currently, the program is printing:

    5.1 Length of the Node Info matrix.

    5.2 Whether the Goal State is achieved.

    5.3 The Computational Time.

    5.4 Total Number of the Nodes the program has visited.

I have commented the print commands for the Node Path (Path in the program), the Nodes and the Node Info (Info in the Program), because it was taking a lot of screen space, when executed.

I have written the command to store the outputs in the text file as asked.

The only package you need installed for this program is **NumPy.**

The maximum time that is taken by the program to find the goal state is less than a minute (~ 40secs).

Outputs you'll receive once the program runs are:

1. **NodeInfo.txt** = gives you Child ID and Parent ID.

2.**Nodes.txt** = gives you all the Matrices explored, in the format asked on Canvas.

3.**NodePath.txt** = gives you the path from initial state to goal state, in the format asked on Canvas.

The functions created in the program are:

1. The search algorithm: **bfs()**
2. The moving action (Up, Down,Left,Right) : **Moving_Action()**
3. To check if the goal state is achieved : **Check_GoalState()**
4. To write the text files : **Output()**