

Assignment No: 01 8 puzzle problem sloved report

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Abstract—Abstract—The 8-puzzle problem is a puzzle invented and popularized by Noyes Palmer Chapman in the 1870s. It is played on a 3-by-3 grid with 8 square blocks labeled 1 through 8 and a blank square. Your goal is to rearrange the blocks so that they are in order.

n

Index Terms—Python

I. INTRODUCTION

The puzzle can be solved by moving the tiles one by one in the single empty space and thus achieving the Goal state. 8-Puzzle is an interesting game which requires a player to move blocks one at a time to solve a picture or a particular pattern. In this article I will be showing you how to write an intelligent program that could solve 8-Puzzle automatically using the A* algorithm using Python and PyGame. Instead of a picture, we will use a pattern of numbers as shown in the figure, that is the final state. If you need to go through the A* algorithm theory or 8-Puzzle.

II. LITERATURE REVIEW

The study of heuristics in human decision-making was developed in the 1970s and the 1980s by the psychologists Amos Tversky and Daniel Kahneman although the concept had been originally introduced by the Nobel laureate Herbert A. Simon, whose original, primary object of research was problem solving that it showed.

III. ALGORITHM FOR 8 PUZZLE:

Solving 8-Puzzle manually varies from person to person. To solve it by computer or AI, we need a bit of a basic understanding of how it works to get the Goal node.

Following are the steps:

1. Get the current state of the scenario (refers to the board or game in real world).
2. Find the available moves and their cost.
3. Choose the move with the least cost and set it as the current state.
4. Check if it matches the goal state, if yes terminate, if no move to step 1. In the code, our agent (program) will look for an empty space ('0') in a state and then which moves are allowed and have the least cost. As a result it will move towards the goal which is our final state.

IV. WHICH TECHNIQUES ARE USED TO 8 PUZZLE GAME

The 8-puzzle is a sliding puzzle that consists of a frame of numbered square tiles in random order with one tile missing. The more general n-puzzle is a classical problem which can be solved using graph search techniques.

V. RULES OF SOLVING PUZZLE

Instead of moving the tiles in the empty space we can visualize moving the empty space in place of the tile. The empty space can only move in four directions (Movement of empty space) 1. Up 2. Down 3. Right or 4. Left The empty space cannot move diagonally and can take only one step at a time.

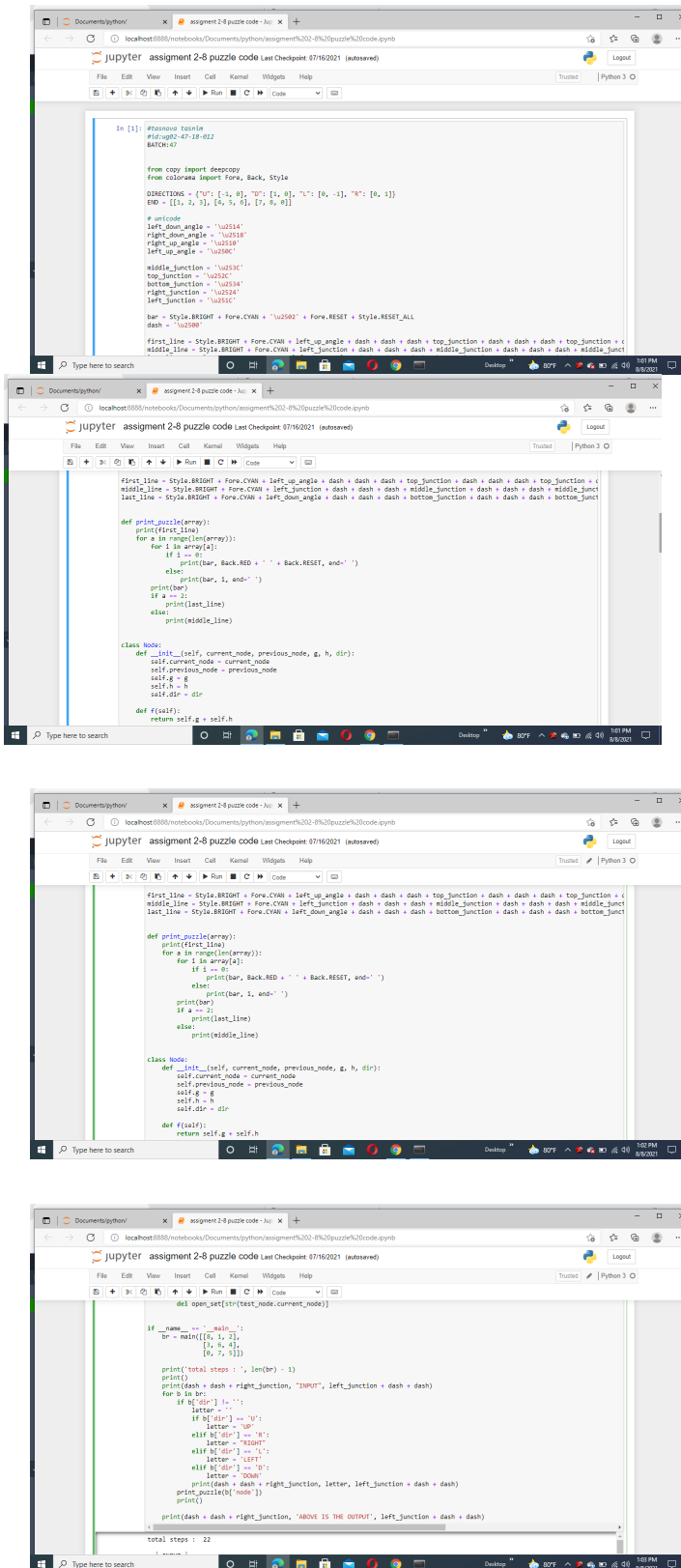
VI. CONCLUSION

I am testing my code to see that how many states it would take to get from the current state to the goal state, I am trying many of moves and that works. Puzzles are also good for the brain. Studies have shown that doing jigsaw puzzles can improve cognition and visual-spatial reasoning. The act of putting the pieces of a puzzle together requires concentration and improves short-term memory and problem solving.

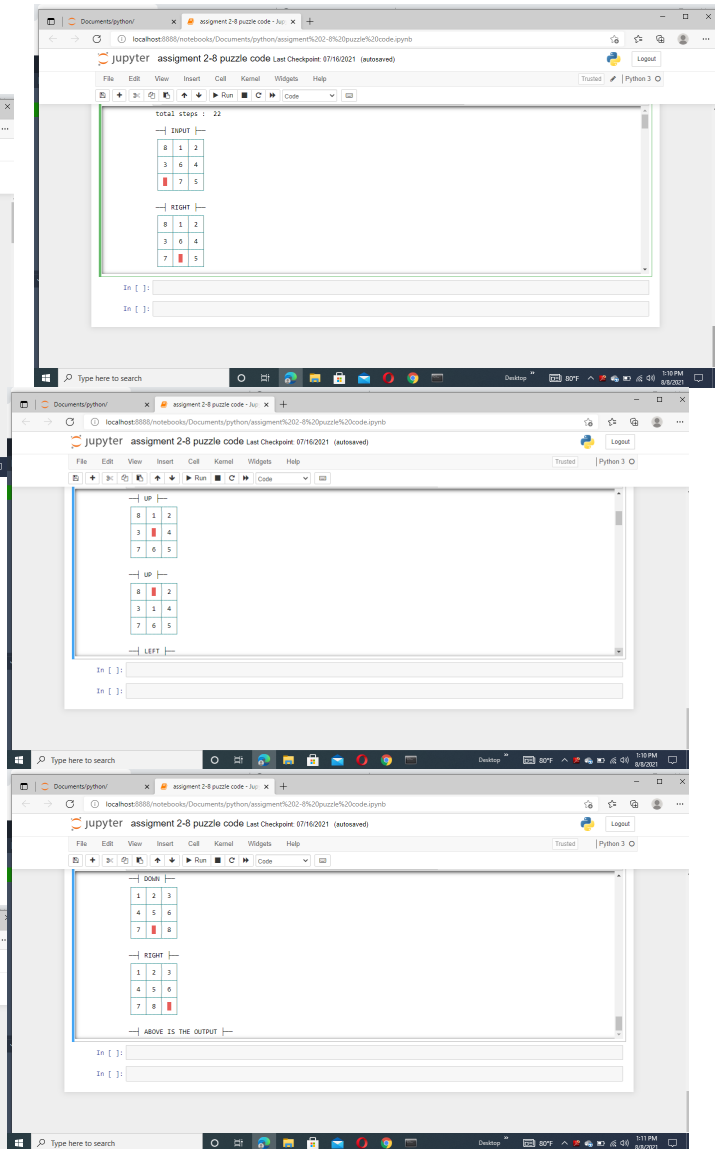
ACKNOWLEDGMENT

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VII. CODE PIC



VIII. OUTPUT



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