Draghici Andreea-Maria
CR 2.1B

Raport Laborator 5

The 8-puzzle problem:

I implemented the Manhattan distance heuristic function for the 8-puzzle problem. It calculates the distance between two points with the formula abs(x1 - x2)+ abs(y1 - y2). I am using s/3 and s%3 to transform the number at which the point is found in the list in x1,y1. I attach a screen with the implementation, in the code there are also attached comments.

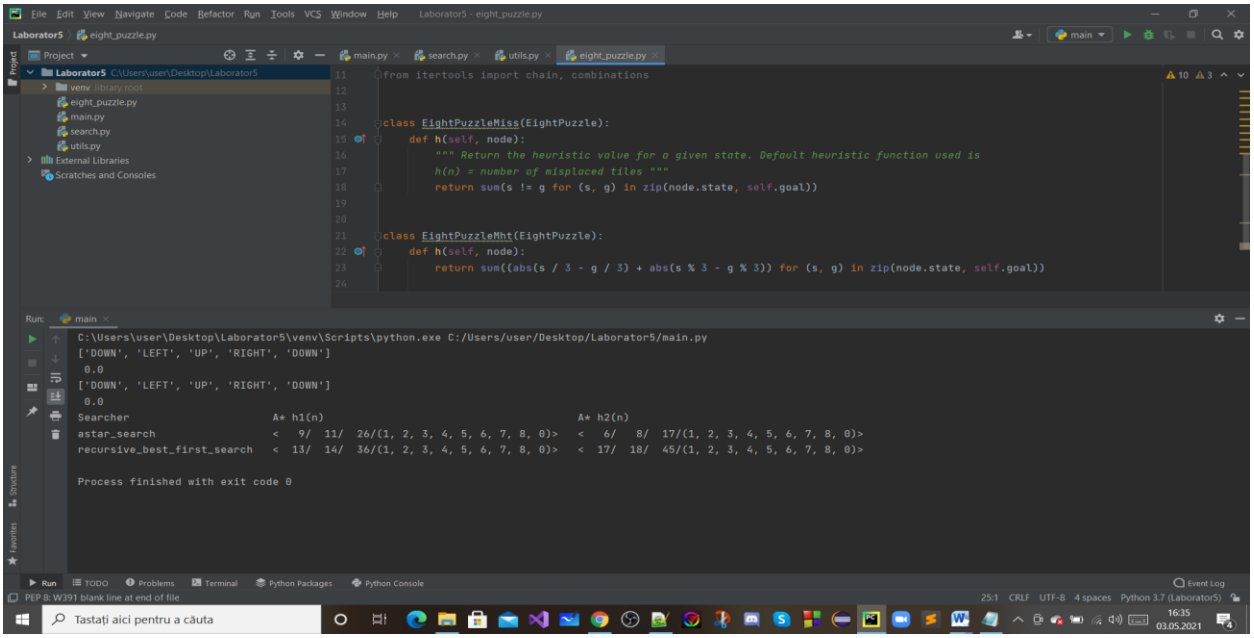

Fig.1- Implementarea functiei

I overwrote the h method to return the sum of the Manhattan distances of all plates related to the target state.

Using the code main.py, I try to compare different heuristic functions for the problem with 8 puzzles. I attach a screen with the implementation.

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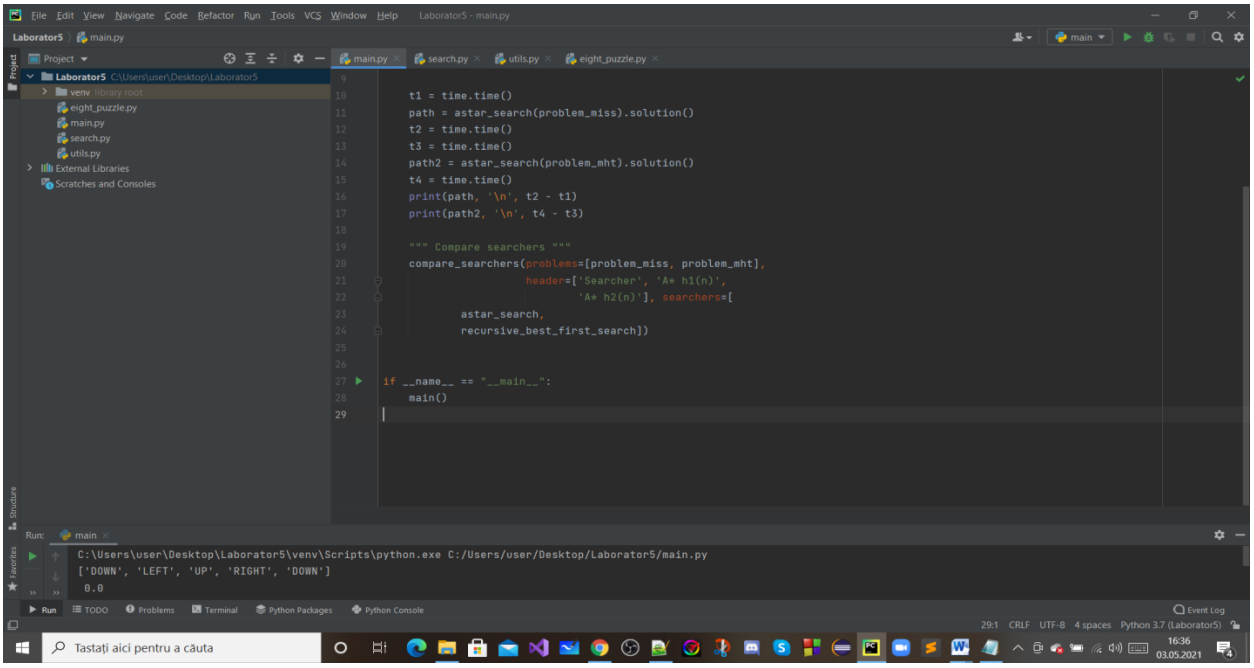

Fig.2- main.py for 8-puzzle problem

The output represents the list of moves to achieve the goal for each heuristic, the time it takes to solve the problem for each heuristic and the comparison using compare_searchers function. I attach a screen with the run test (results).

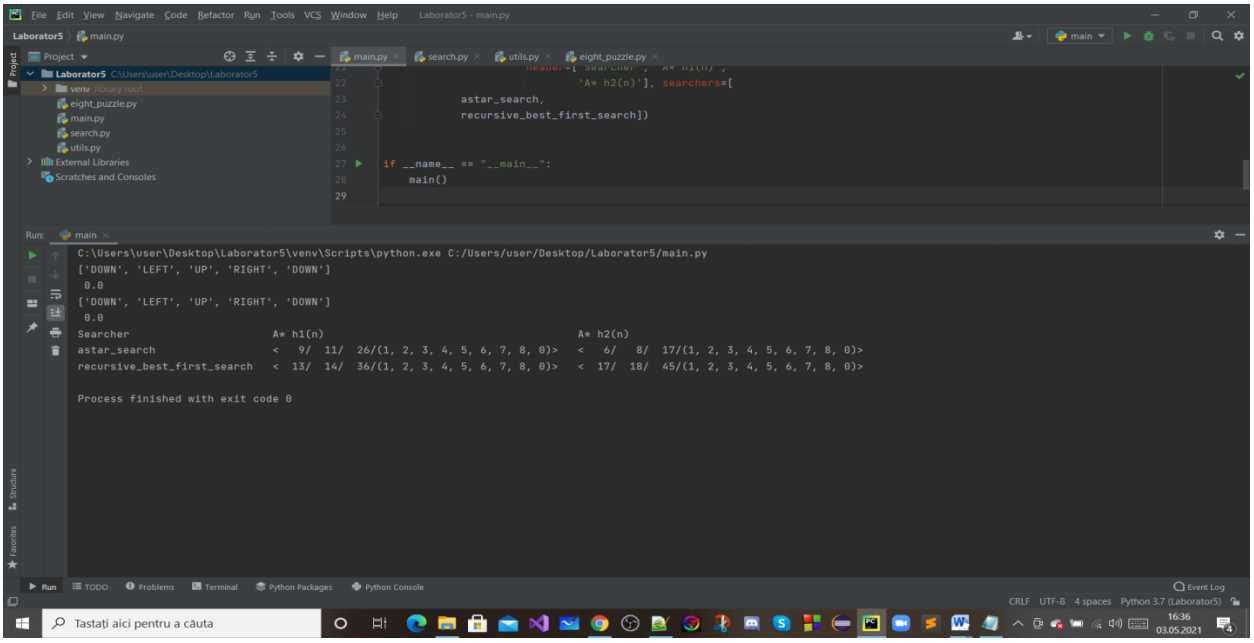

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Fig.3- run test

The 15-puzzle problem:

For this problem i have adapted the EightPuzzle class to the Puzzle15 class by changing the numbers. For example in the actions function i have modified the numbers so it can work on the 15-puzzle by using %4 instead of %3 and so on.

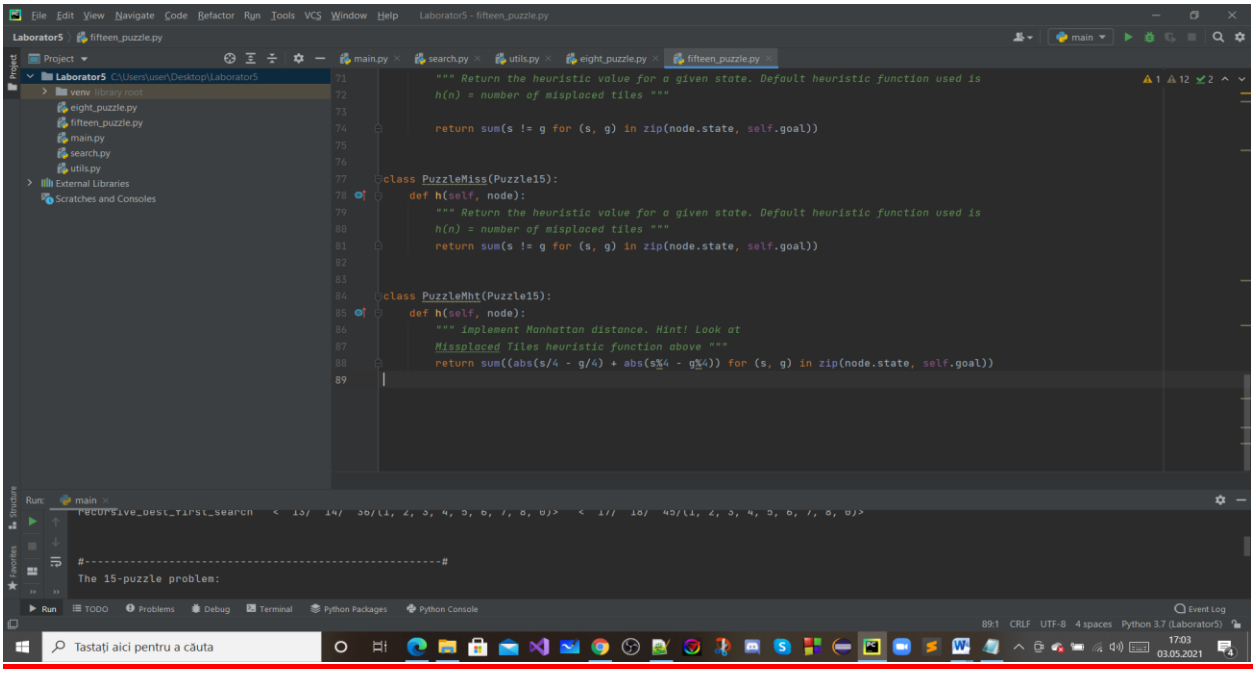

Fig.4-Implementarea functiilor

Misplaced: It counts the number of misplaced tiles.

Manhattan Distance: It calculates the distance between two points with the formula abs(x1 - x2) + abs(y1 - y2).I am using s/4 and s%4 to transform the number at which the point is found in the list in x1,y1.

Using the code main.py, I try to compare different heuristic functions for the problem with 15-puzzles. I attach a screen with the implementation.

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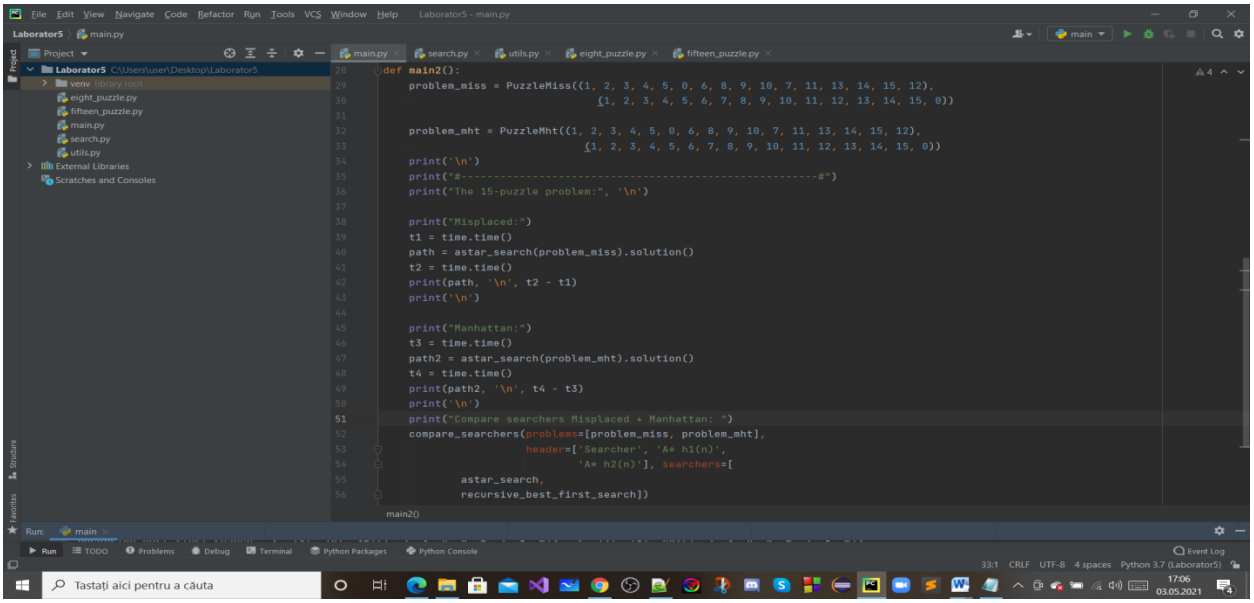

Fig.5- main.py for 15-puzzle problem

The output represents the list of moves to achieve the goal for each heuristic, the time it takes to solve the problem for each heuristic and the comparison using compare_searchers function. I attach a screen with the run test (results).

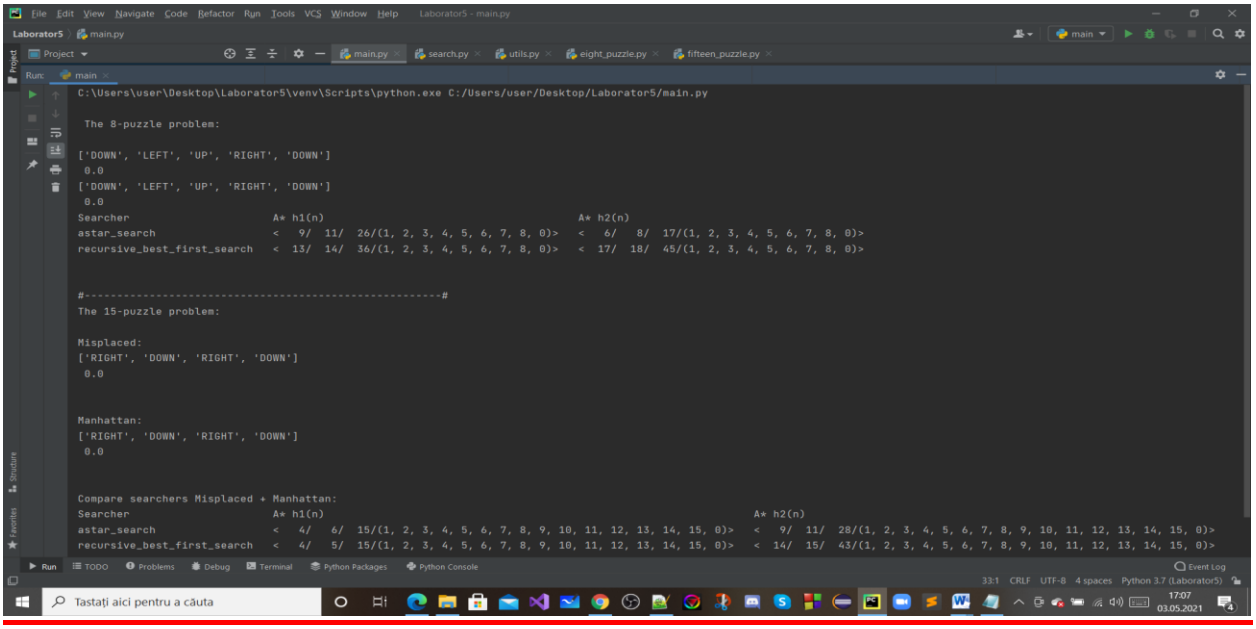

Fig.6- run test