Introduction To Artificial Intelligence

Lab 1 - Search

1. Contents:

In this lab, students are required to research and implement the searching algorithm:

- **Depth-first search (DFS)**
- **Breadth-first search (BFS)**
- **Uniform cost search (UCS)**
- **Iterative deepening search (IDS)** that uses depth-first tree search as a core component and avoids loops by checking a new node against the current path.
- **Greedy Best First Search (GBFS)** with h = edge weight
- **A*** with h = eclidean_distance(pos[current vertex], pos[Goal]))

You will implement the above algorithms in the python file: ***student_function.py*** (follow written parameters).

Students only need to install the functions in the ***student_functions.py file***. The other files are support functions, students should read them to understand more about the program, but may not need to edit anything. (If you do edit other file for whatever reason, please tell it clearly in ***readme*** file.

2. Submit instruction:

Name the folder with your student ID (for example, if your ID is 1234567, then name the folder 1234567). The folder will contain:

- **Source Code**
- **Input**: This folder contain some example graph, inaddition to the one given to you.
- **Output**: This folder contain the corresponding search results for each graph. The output should be visualized, but you also need to write it into a text file (visited, path).
- **Document**: Create a PDF-formatted file that includes a checklist of what you have/have not done and a description of the main functions. For each algorithm, student report:
    - The idea of the algorithm.
    - Example (reference section input/output)
    - Conclusion, pros, and cons
- File ***readme.txt*** contains the link to the video you visualize the step of each algorithm. The video should be post on youtube with unlist option.

Then compress the folder and submit it on moodle.

3. Instruction:

You need to install the required packages for running the program.

Run program: read comments in **_main.py_** for more information

Input.txt format:

Line 1: Start End
n following lines: Adjacency matrix (n x n)