Vietnam National University, Ho Chi Minh City
University of Technology
Faculty of Computer Science and Engineering

INTRODUCTION TO ARTIFICIAL INTELLIGENCE (CO3061)

Assignment

Search Algorithms

(UPDATE January 27th, 2026)

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Topic: Search Algorithms

1 Objectives

- Implement basic search algorithms.
- Improve programming skills and problem-solving abilities.

2 Introduction

Many problems are commonly used to introduce topics in Artificial Intelligence, such as Block World, Water Jug, N-Puzzle, etc. In this semester, students are required to implement several search algorithms (using Python) to solve specific problems.

3 Requirements

- **Problem:** Logic Puzzles (Puzzle Pipes and other puzzles on this site).
- Each group selects **2 puzzles** from the Logic Puzzles list. For each puzzle, implement:
  a) Blind search: DFS or BFS
  b) Any heuristic search algorithm (e.g., A*, Hill Climbing, ...)
- Python 3 is mandatory (using other languages such as Python 2 will result in a 50% grade penalty).
- Students should design appropriate input based on reference materials.
- Students are encouraged to implement a step-by-step demo with a visual display (like a game). *Note: output may be text-only.*
- Students must write a report explaining the research and implementation process. The report should include tables showing runtime and memory usage for each algorithm with different inputs, along with explanations.

4 References

- Course materials
- Depth-first search
- Breadth-first search
- Hill climbing
- A* search algorithm
- Puzzle Pipes

5 Evaluation

The assignment will be graded on two components:

- **Video presentation (Grade A):** Each group records a short video (5–10 minutes) presenting the two puzzles, solutions, and results.

- **Written report (Grade B).**

Final grade is calculated as:

$$\text{Final Grade} = \frac{2 \cdot A \cdot B}{A + B}$$

Each of the two search algorithms contributes equally (50% each).

6 Submission

- Only one member of each group submits on BKEL.
- Submit a **.zip** file containing:
  - Source code files
  - Report file
  - A text file with the video link (YouTube or Google Drive)
- Deadline: **23:55, March 2, 2025**

7 Academic Integrity

Violations will be handled according to university regulations.