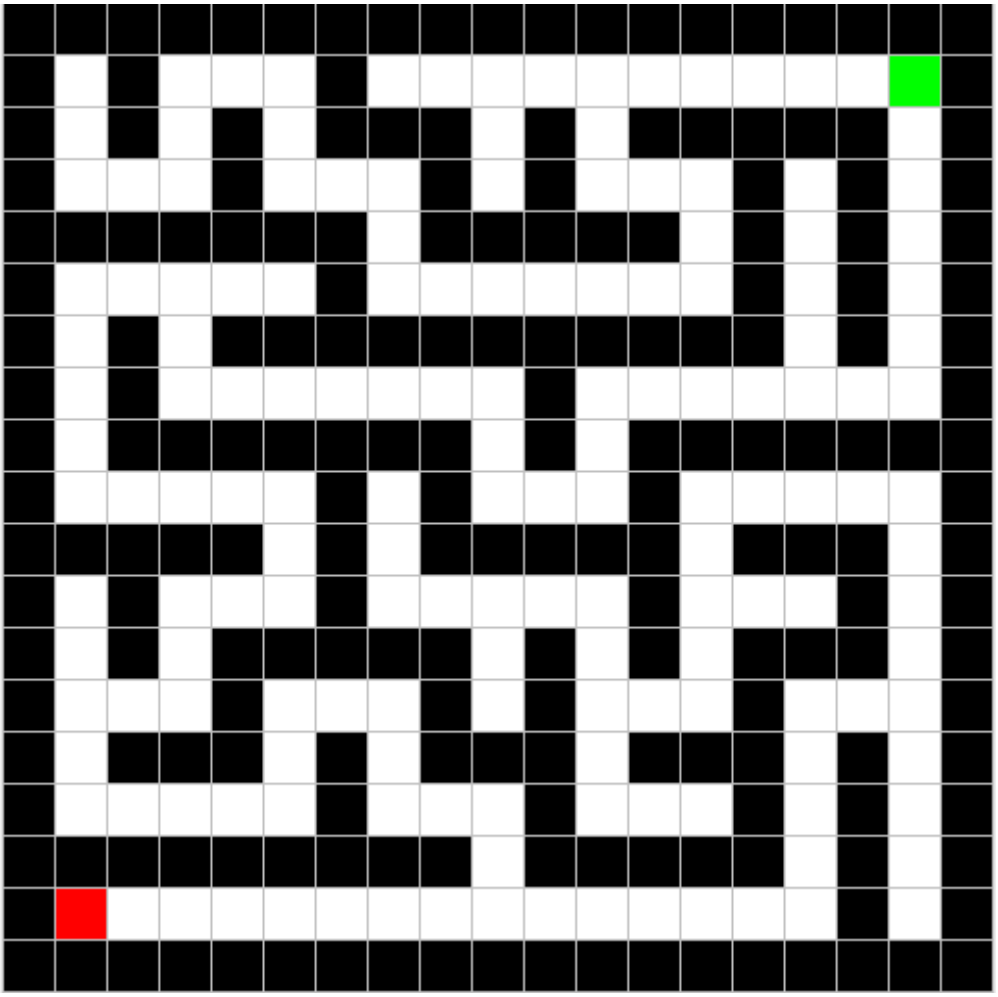
KING ABDULAZIZ UNIVERSITY
Faculty of Computing & Information Technology
Department of Computer Science

CPCS-331 Artificial Intelligence (I)
AI Group Project: Solving Maze Problems

Assignment Instructions for AI Group Project: Solving Maze Problems



Assignment Overview: This is a group assignment focused on Artificial Intelligence (AI) and involves writing a program and a report for solving real maze problems. Your task is to find the path from the start state to the goal state in a maze environment using Depth-First Search (DFS) and Breadth-First Search (BFS) algorithms.

KING ABDULAZIZ UNIVERSITY
Faculty of Computing & Information Technology
Department of Computer Science

Assignment Details:

1. Group Collaboration:

- This assignment is a group project, and all group members must actively cooperate with each other.
- Select a programming language that best suits your team's skills and preferences.
- Each group member should be prepared to contribute to the proposed solutions and implementation.

2. Problem Description:

- The maze environment size is 20*20, which consists of four directions: N (North), S (South), E (East), and W (West).
- The agent's actions involve moving in these directions (left, right, or forward).
- The maze may contain walls (illegal states) that the agent must avoid colliding with.
- The agent's primary goal is to find a plan that leads from the start state to the goal state within the maze.

3. Assignment Components:

- The assignment consists of two main components:

a. Formal Analysis:

- Provide a comprehensive formal analysis that includes:
    - **PEAS:** Clearly define the Performance measure, Environment type, Actuators, and Sensors for your agent.
    - **Environment Type:** Describe the type of environment your agent operates in (e.g., Fully observable, Partially observable, Deterministic, Stochastic, etc.).
    - **Formulation of the Search Problem:** Present a detailed formulation of the search problem, including the initial state, goal state, state space, operators, and any relevant assumptions.

b. Agent Program Implementation:

- Implement an agent program that allows the agent to navigate through a maze game environment.
- Implement both Depth-First Search (DFS) and Breadth-First Search (BFS) algorithms to find the path from the start state to the goal state.

4. General Guidelines:

- Ensure clear communication and collaboration within your group.
- Document your code thoroughly, including comments and explanations.
- Test your program thoroughly to ensure it functions correctly.
- The report should be well-structured, and any external sources or references should be **properly cited.**
- Make sure your implementation considers illegal states (walls) and handles them appropriately.

5. Submission:

- Submit your completed assignment, including both the program code and the formal analysis report, according to the instructions provided by your instructor or institution.

6. Grading Criteria:

- Your assignment will be evaluated based on the correctness and efficiency of your agent's program, the quality of your formal analysis, and your overall documentation.

7. Deadline:

- Adhere to the assignment submission deadline provided.

Remember: Effective communication, teamwork, and a well-documented approach will contribute to your group's success in completing this assignment.

Good luck,

Dr. Nawaf