

# Crossword Game

## PEAS (Performance measure, Environment, Actuators, Sensors):

**Performance Measure:** The performance measure for the crossword game can be defined as the successful completion of the crossword puzzle by filling all the blanks with valid words from the given word list.

**Environment:** The environment for the crossword game consists of a 2D grid representing the crossword puzzle and a word list containing valid words that can be used to fill the blanks in the puzzle.

**Actuators:** The actuator in this game is the player who interacts with the system by entering words to fill the crossword puzzle.

**Sensors:** The sensors in this game are the input mechanism (e.g., keyboard) used by the player to enter words and the

display mechanism that shows the current state of the crossword puzzle.

## **ODEASA (Observability, Deterministic, Episodic, Static, Agent) Observability:**

**Observability:** The game is fully observable as the player can see the crossword puzzle grid, including the filled-in letters and blank spaces.

**Deterministic:** The crossword game is a deterministic, the next state is completely determined by the current state.

**Sequential:** The crossword is sequential, the current decision could affect all future decisions.

**Static:** The environment is unchanged while an agent is deliberating.

**Discrete:** A limited number of distinct, clearly defined states, percept and actions.

**Single agent:** The agent operating by itself.

## **Problem Formulation:**

**Initial State:** An empty crossword puzzle grid with blank positions.

**Successor Function:** The successor function takes the current state of the crossword puzzle and a word as input.

**Actions:** Enter a word to fill the crossword puzzle

**Goal Test:** Check if the crossword puzzle is completely filled with valid words without conflicts.

**Transition Model:** Given a current state and an action, the transition model attempts to place the word in empty positions of the puzzle without conflicts.

**Path Cost:** The path cost in the crossword game is the number of words entered to complete the puzzle.