Project Proposal: Ping Pong Game

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Project Summary

This project is a digital recreation of the classic Ping Pong game using the Python turtle module. The game features two paddles controlled by players and a bouncing ball. The game supports real-time paddle control, scoring, and ball-paddle interaction. It's ideal for beginners to understand real-time game logic, basic collision detection, and event-driven programming in Python.

Assignment (1) Design the agent for your projects? (PEAS)
PEAS Description (Performance, Environment, Actuators, Sensors)

Component	Performance	Environment	Actuators	Sensors
Description	Players gain points by hitting the ball and preventing it from passing their paddle. Higher score indicates better performance.	A graphical window (800x600 pixels) containing two paddles, a ball, and a score display	The paddle objects move up and down based on keyboard input (W/S for Player 1, Up/Down for Player 2). The ball moves automatically.	Game checks for keyboard inputs and collisions between ball, walls, and paddles.

Assignment (2) Specify the agent's environment for your project? (ODESDA)

ODESDA Analysis (Observable, Deterministic, Episodic, Static, Discrete, Agent)

Fully Observable- Deterministic- Sequential- Dynamic-Continuous -
Agent Type: Multi-Agent ,Competitive

Assignment (3) Describe the agent type for your project? Simple-reflex agent? Why? Why not? Model-based agent? Why? Why not? Goal-based agent? Why? Why not? utility-based agent? Why? Why not? ping pong

1.Simple Reflex Agent

- Description: A simple-reflex agent acts only on the current percept, ignoring the rest of the environment history.
- Is it suitable? ❌ Not suitable
- Why not?
- In ping pong, the agent must anticipate the ball’s movement, which requires knowledge of speed and trajectory. A simple-reflex agent would only react to the current ball position and fail to respond effectively to changing speeds or predict where the ball will go.

Assignment (3) Describe the agent type for your project? Simple-reflex agent? Why? Why not? Model-based agent? Why? Why not? Goal-based agent? Why? Why not? utility-based agent? Why? Why not? ping pong

2. Model-Based Reflex Agent

- Description: This agent maintains an internal model of the environment and can infer hidden aspects of the game.
- Is it suitable? ✅ Yes
- Why?
- A model-based agent can track the ball’s position, velocity, and direction over time. It allows the agent to make more intelligent paddle movements by predicting the ball’s path, which is essential in ping pong.

Assignment (3) Describe the agent type for your project? Simple-reflex agent? Why? Why not? Model-based agent? Why? Why not? Goal-based agent? Why? Why not? utility-based agent? Why? Why not? ping pong

3. Goal-Based Agent

- Description: This agent takes actions based on achieving a specific goal.
- Is it suitable? ✅ Yes
- Why?
- The goal of the agent in ping pong is to return the ball and score points. A goal-based agent can plan a series of moves not just to hit the ball, but to hit it in a way that increases the chance of scoring or avoiding a miss.

Assignment (3) Describe the agent type for your project? Simple-reflex agent? Why? Why not? Model-based agent? Why? Why not? Goal-based agent? Why? Why not? utility-based agent? Why? Why not? ping pong

. Utility-Based Agent

- Description: Utility-based agents consider multiple possible outcomes and choose actions that maximize a utility function (like success probability or score).
- Is it suitable? ✅ Yes (Best for advanced AI)
- Why?
- In competitive or advanced AI ping pong, a utility-based agent can weigh decisions (e.g., hit fast to corner vs. slow return) and choose actions that maximize winning chances, minimizing errors or maximizing difficulty for the opponent.

Conclusion

This project not only reinforces Python fundamentals but also introduces key concepts of real-time interaction, object control, and simple AI decision-making. It serves as an engaging introduction to game development and graphical programming.

Thank You

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