Seasons of Code 2025: RL in Self-Driving Cars
Assignment - 2

Objective

Implement a Pure Pursuit controller for a car-like robot to follow a predefined path, using a kinematic bicycle model. You will also implement a PID controller for speed regulation.

Task

Complete the Python worksheet provided along with this assignment. You must implement the missing logic inside the class methods and functions specified. Start by testing on a straight-line path, then use the provided sinusoidal path for final evaluation.

You are expected to:

- Understand the structure of a vehicle state update using the kinematic bicycle model.
- Implement the Pure Pursuit steering logic to compute steering angles from a look-ahead point.
- Implement a proportional controller (PID simplified to P) for controlling speed.
- Visualize the vehicle path tracking and speed profile.

Submission

Submit a ZIP folder named `<YourName>_<YourRollNo>.zip` containing:

- The completed Python worksheet (.py file)
- Screenshots or plots of the vehicle trajectory and speed vs time
- (Optional) An animation or video capture of the simulation