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| **Project title** | **Monaco GP Arcade Game** |
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# Task Description

The Monaco GP Arcade Game is an interactive Java-based racing game inspired by the iconic Monaco Grand Prix. The game provides an engaging user experience with a graphical user interface (GUI) that allows players to control a racing car, avoid obstacles, and compete for the highest score. The game includes features such as dynamic road environment, and a challenging computer-controlled opponent.

User Interaction:

1.Start Screen:

* The game starts with a welcoming screen displaying the title "Monaco GP" in bold.

2.Gameplay:

* Once the game starts, the player's car appears at the bottom of the screen.
* Users control the car's movement using mouse or key movements.
* The objective is to avoid oncoming cars and navigate through a challenging track.
* The score is displayed at the top of the screen, indicating the number of cars avoided.

3. Obstacles and Challenges:

* Computer-controlled cars (opponents) appear on the road, and players must avoid collisions.

4. Pause Screen:

* Players can choose if to stop for a breath of fresh air, but still keep their progress, by pressing the ESCAPE key, which will prompt the game to open the pause menu, the same screen as the start screen.

5. End of Game:

* The game ends when the player's car collides with an opponent.
* The final score is displayed along with a game-over message.
* Players can choose to restart the game.

Task Division:

* GUI Design: Responsible for creating visual elements, including the start screen, gameplay interface, and game-over screen.
* Player Controls: Implement the logic for user interactions, allowing smooth control of the player's car using mouse movements or key presses.
* Obstacle Generation: Develop the mechanism for generating computer-controlled opponents and dynamic road elements.
* Score Tracking: Implement the scoring system to keep track of the player's progress and display the final score at the end of the game.
* Game Logic: Oversee the overall game logic, including collision detection, obstacle avoidance, and handling user inputs.

This Monaco GP Arcade Game aims to provide an immersive and enjoyable gaming experience, capturing the excitement of racing in the prestigious Monaco Grand Prix.

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| **Player Class** | |
| Move the player on the track. | Road  Cars |
| Avoid collisions with other cars. | Road  Cars |

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| **Cars Class** | |
| Move on the track. | Road |
| Avoid collisions with the player and other cars. | Road  Cars |

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| **Road Class** | |
| Generate and manage the road environment. | Player  Cars |
| Spawn new road elements. | Cars |

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| **Track Class** | |
| Initialize and run the game loop. | Player  Cars  Road |
| Render the game elements on the screen. | Cars  Road |

# Class Diagram

Road

Track

Cars

Player







