Project Proposal

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1. Group Members

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2. Main Idea and Core Mechanism

This project aims to develop a racing game based on AI control and player interaction, highlighting the racing experience and collection elements. Players will control the racing car to speed along the selectable tracks, complete challenges and daily tasks, defeat AI opponents, and collect gold coins in the process to upgrade levels and vehicles.

The game emphasizes speed, reaction, strategic choice and stage growth, integrating traditional arcade racing with modern game psychological mechanisms to enhance players' sense of participation and immersion.

Core Gameplay Mechanics

- **Racing Competition:** Players race alongside AI opponents, aiming to complete the track within a time limit and stay ahead of the AI.

- **Gold Coin Collection and Item Usage:** Tracks are populated with gold coins, speed boosters, and obstacles. Players must quickly choose optimal routes.

- **Vehicle Growth and Unlocking:** Players can unlock more advanced racing cars with gold coins or achievements to enhance speed and handling.

- **AI Learning Mechanism:** AI opponents dynamically adjust their performance to provide an ongoing challenge and increase replayability.

3. Technical Aspects and Challenges

- **Animation & Control Responsiveness:** Achieving smooth vehicle animations and fine-tuned player control to enhance realism and immersion requires careful use of physics systems and animation blending in Unity.

- **AI Behavior Design:** Developing AI opponents that can dynamically adjust their speed and racing strategy in response to the player's actions is complex. Maintaining a close but fair competition is essential for maximizing psychological engagement.

- **Track Elements & Item Placement:** Managing the random or semi-random distribution of collectible items, traps, and interactive zones along the track requires precise pathfinding and game object management logic.

4. Psychological Principles

1. Immersion

The game utilizes realistic engine sounds, physical feedback (e.g., drifting, crashing), and dynamic weather to draw players into a believable racing environment. A minimalist UI ensures uninterrupted gameplay, helping players achieve a state of flow.

2. Risk vs. Reward Decisions

Each decision—choosing a shortcut, using a booster, or overtaking an AI—balances risks and benefits. For example:

- Collecting more coins may unlock better cars, but crashing reduces speed.

- Acceleration zones offer speed boosts, but must be timed well.

- Overtaking may lead to collisions and lost time.

3. Character Development & Competence

Unlocking cars with different stats meets autonomy needs, while mastering drifting and tracks provides a sense of progress and control.

4. Immediate Feedback & Rewards

- Coin collection is reinforced with sound and animation.

- A leaderboard and post-race rewards create long-term goals.

- Varying track difficulties and hidden routes increase engagement.

5. Challenge & Mastery

Multiple difficulty levels and AI opponents allow players to advance from beginner to expert. Successful runs earn badges and unlocks, forming a positive feedback loop.

5. Task Breakdown

- **Wufeiyang Chen:** Figma prototype, Unity vehicle mechanics, GitHub version control, Markdown documentation.

- **Shihan Bao:** Markdown writing and the button settings

- **Siyuan Huang:** Game mode system and item interactions.

- **Zihan Liu:** Final presentation slides and design the future work.