GAME RULE

Welcome to the Two-Wheeled Self-Balancing Car Obstacle Course Race!

In this exciting competition, two two-wheeled self-balancing cars will face various challenges together. They need to carry a 20mm x 30mm board, cross a 5-meter long and 2-meter wide track, avoid obstacles, and race towards the finish line. Each car has unique abilities—one is equipped with an ultrasonic module to detect obstacles, while the other does not have this module. However, both cars can collaborate through **Bluetooth communication** for a contest of speed and strategy!

1. Track and Starting Point

The race will take place on a 5-meter long and 2-meter wide track. Both cars will start from the empty space at the beginning of the track. At the start of the race, the cars need to perform a **360-degree rotation**, signaling the beginning of the competition. You can choose to:

- Stack the two cars together to proceed as one;
- Let them set off separately to explore the track independently;
- Open your mind and discover your own way!

The Bluetooth connection enables the cars to share information, ensuring coordinated teamwork.

2. Track Selection

There are three different difficulty levels for the tracks, each offering unique challenges:

- **Easy Track**: The obstacles are only cylindrical, spaced 60-70mm apart, with a starting score of **100 points**.
- **Medium Track**: This includes various shapes of cylindrical obstacles (such as rectangular and cylindrical pillars), spaced 50-60mm apart, with a starting score of **120 points**.
- **Hard Track**: This track features a combination of conical and cylindrical obstacles, spaced 40-50mm apart, with a starting score of **150 points**.

3. Obstacle and Scoring Rules

Each track’s obstacles will impact the player's score, but the rules have been reversed: hitting cylindrical obstacles deducts the most points, while other obstacles result in smaller penalties. The specific deduction rules are as follows:

- **Cylindrical obstacles**: Colliding will deduct **10 points**.
- **Rectangular obstacles** (Medium track): Colliding will deduct **8 points**.
- **Conical obstacles** (Hard track): Colliding will deduct **5 points**.

The ultrasonic module allows the car to detect obstacles and communicate their locations to its partner via Bluetooth, helping them avoid collisions together.

4. Time and Scoring

During the first **30 seconds**, no points will be deducted for time consumption. However, after 30 seconds, each additional second will deduct **1 point**. Therefore, the faster the cars reach the finish line, the higher the score.

Upon reaching the end of the track, the cars must complete another **360-degree rotation**, marking the end of the race and stopping the timer.

5. Special Zones and Bonuses

Several **special zones** are hidden throughout the track. Entering these zones will award the cars with **bonus points**, usually ranging from **5 to 20 points** depending on the track. The car equipped with the ultrasonic module can detect these zones and share the information with its partner via Bluetooth, helping the team earn more bonus points.

6. Scoring Formula

The final score will depend on three factors:

- Time spent (after the first 30 seconds)
- Number of collisions
- Bonus points

Score Calculation Formula:
Final score = Starting score - (Time deduction × Race time) - (Collision penalty × Number of collisions) + Bonus points

- **Time deduction** (after 30 seconds): 1 point per second
- **Bonus points**: Depends on the special zones, usually 5-20 points

For example, if a team chooses the **Hard track** (starting score of **150 points**), completes the race in **40 seconds** (with the first 30 seconds free from deductions, leaving 10 seconds for time penalty), collides with **2 cylindrical obstacles** and **1 conical obstacle**, and earns **10 bonus points**, the final score would be calculated as:

Final score = 150 - (1 × 10) - (10 × 2) - (5 × 1) + 10 = 150 - 10 - 20 - 5 + 10 = 125 points

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Ready?

The two cars not only need speed but also perfect coordination and precise control. Let's see which team can stand out on this **5-meter long** and **2-meter wide** track and win the race!