Group 8 GDD
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Overview: With there being only two of us with both of us having minimal knowledge of coding, we decided to do a more simple driving game that incorporates physics into it in order to make the car drive and feel like a real car. we decided to split up so peiyuan did the coding and I did the GDD document.

Objective Statement: the goal of our game is to drive around and for it to feel as if you are driving a real car.

Design Rationale: with there being only two of us we had to find something that was possible for us to do within the given time frame while also balancing our given schedules for life. We felt this game, although simple, was a great fit for our criteria, as well as fitting the assignment criteria. it is simpler but incorporates a physics engine aligning with requirements of the dev-con.

Metric Research and References:
peiyuan worked on the coding

In Unity, I set the car's weight to 1 ton, which is slightly lighter than in real life, but I believe it's an acceptable adjustment. Additionally, setting it to 1 ton in Unity can enhance the gameplay experience. For the power of the car, we first tried 100HP but it's a little bit slowly, so we change it to 250HP

Gas input positive move the car negative brake the car
engine work increases the speed of the wheel. We are planning to multiply gas input with motor power. so get the value of the car to accelerate. and apply it to the wheel collider to let the car move.

The steering system will be different from what was done before; it's not about specific values like 30 degrees or 60 degrees. In real life, it’s impossible to suddenly turn at a 60° angle while driving at 80 km/h. Therefore, the steering should follow a curve.

During testing, it was found that the front wheels lacked sufficient traction when turning, causing the car to lose speed quickly during corners. Therefore, the stiffness of the front wheels was increased.

During testing we find the brake is not good, we have to check the angle against the velocity to make sure the forward angle and side way to make the drift angle. If it is more than 120 degrees we should reverse the car, if it is less than 120 degrees we should give brake pressure.

For brake power, the front wheels will get 70% of the power and back wheels will get 30% of the power. because in the real world, when the car brakes, the front of the car naturally goes down.

Citations:

Terrain Tutorial:
https://www.youtube.com/watch?v=MWQv2Bagwgk
Position Cameras Tutorial
https://www.youtube.com/watch?v=DXri5QRC3HU
Realistic Car Controller Tutorial
https://www.youtube.com/watch?v=jZk9nUQQpO0&t=354s
Car Physics Tutorial
https://www.youtube.com/watch?v=8xdXJtu6nig&t=715s
Third Person
https://www.youtube.com/watch?v=owW7BE2t8ME&t=1000s