You are now working on a game called Car Driving Online. It's a car driving simulation game, where player can freely drive his car around, collecting stuffs, making stunts, and joining online with other friends (using Photon Unity Networking - PUN)

### **Physics**

1. You are about to implement the buoyancy effect for a special car type, which can move freely above the water level. How can you solve that problem using PhysicsX?
2. 2. Answer:

Create a water.cs script in which there is OnTriggeStay when the car enters the water collider, AddForce with type acceleration to the top of the car's rigid body. The deeper the car, the larger the addForce

### **Architecture Design questions**

1. You are about to implement the collection system, which handles 3 things : allows the designer to manually place tokens around the map, allows the player to collect those tokens by colliding with them, and allows the player to unlock new character skins / vehicle skins / etc when collecting enough tokens. How do you design that system, in such a way that least-dependant on other gameplay elements, because our current codebase is quite chaotic.

2. Answer:

3. 1.Data

Create a PlayerData.cs class which contains properties: token,List<string> UnlockedSkin, List<string> UnlockedVehicle and this script is Serializable so it can be parsed into JSON for Save. And create a Singleton Player in which there is PlayerData playerData data so that player data can be accessed from anywhere.

Create Database.cs with List<Skin> skins property for list skins.

To unlock the skin, by creating a Skin.cs script in which there is a property string ID, every time a player unlocks a skin, the id will be added to Player.Instance.playerData.UnlockedSkin.

2.Object

Create a Token prefab with the Token.cs script which contains OnTriggerEnter when the player touches the token then the Player.Instance.playerData.token will be added.

### **Networking**

1. The game uses PUN, each player updates his location to others. There is a reported exploit that allows cheaters to cheat by using Cheat Engine to speed up the game. How is that possible ? And what can you do to minimize impacts from that exploit?
2. You are about to design the synchronization mechanism for the game. Each player controls a vehicle, which needs to sync properties below. How do you synchronize those properties?
   1. Position of the vehicle
   2. Rotation of the vehicle.
   3. Wiper State: 3 state - on , low, high
   4. Rear light State: 3 state: off , on , blink
   5. Sidelight State: 4 state: off, on , blink-slow, blink-fast
   6. Horn: player can press and release the horn button, to start and end the horn sound ( he sound continuously plays when player holds the button)
3. Answer:

For PUN, I never use it because in the project I'm working on, the networking doesn't use third parties and the server is made by myself in JSON format via the UDP protocol.

A. For positions that are not sent every frame, only 10 deliveries per second so that it doesn't look broken every time you change positions using lerp

B. For rotation equal to position

C. Wiper state can use int to shorten the string (1=on,2=low,3=high)

D. Rear light State: same as wiper state(1=off,2=on,3=blink)

E. Sidelight State : same as wiper state(1=off,2=on,3=blink-slow,blink-fast)

F. Horn(1=startHorn,2=stopHorn)