PROJECT REPORT

GAME DEVELOPMENT

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COLLEGE NAME : PONJESLY COLLEGE OF ENGINEERING

DEPARTMENT : INFORMATION TECHNOLOGY

YEAR : 4TH YEAR

INTRODUCTION

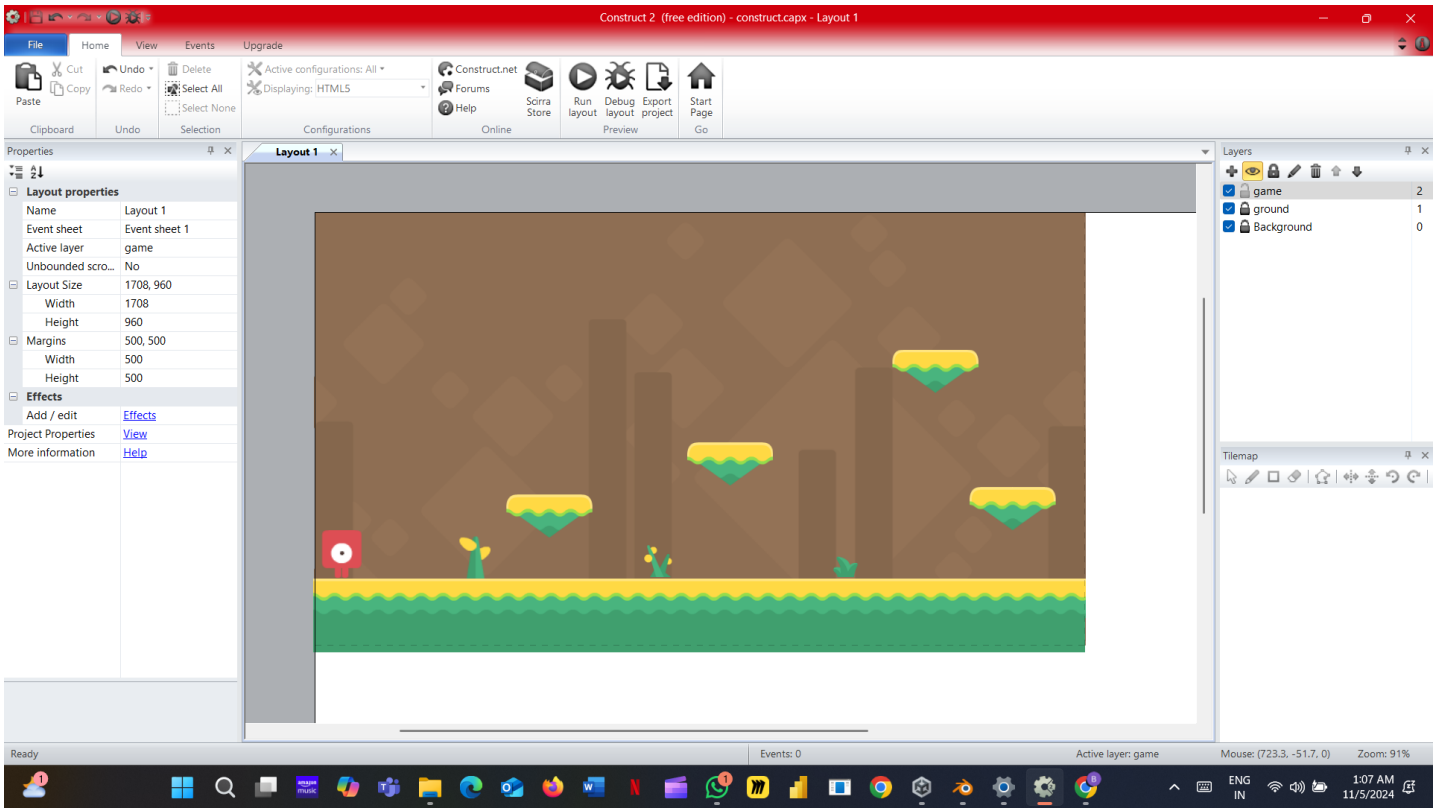
This report outlines the development of three key game development projects aimed at improving my skills in using different game engines and development tools. The projects included:

- A 2D platformer game built in Construct 2 that focused on learning layout design and basic event-driven game mechanics.
- A character controller for Remy in Unity, which involved creating smooth character movement and physics interactions in a 3D environment.
- A car controller system in Unity that emphasized realistic vehicle physics, including acceleration, braking, steering, and suspension, as well as the integration of a dynamic camera system.

Each project was designed to strengthen specific aspects of game development, from handling 2D game layouts and physics to implementing character and vehicle movement systems in 3D environments. These projects not only helped me gain hands-on experience with different development tools but also provided a solid foundation for future, more complex game development tasks.

PROJECT 1: CONSTRUCT 2 - 2D PLATFORMER LAYOUT

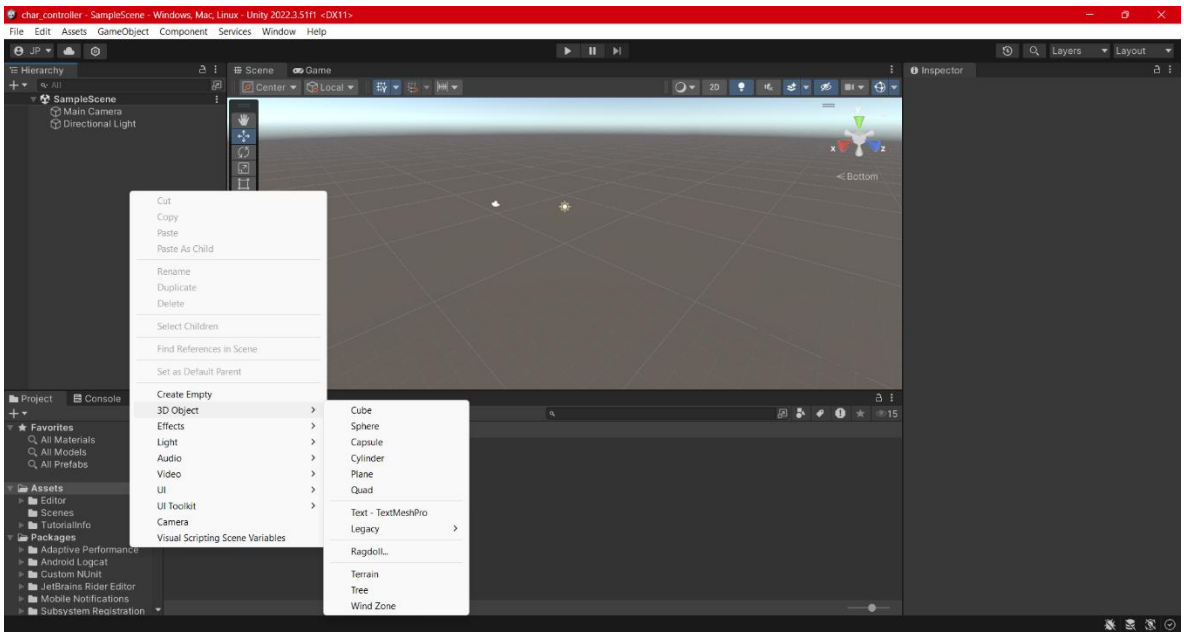
- **Tools Used**: Construct 2
- **Features**:
  - 2D platformer layout with layered platforms and obstacles
  - Basic player movement and object interaction
  - Event-based logic without coding
- **Outcome**:
  - Established platformer mechanics
  - Future plans: Add more levels and advanced features

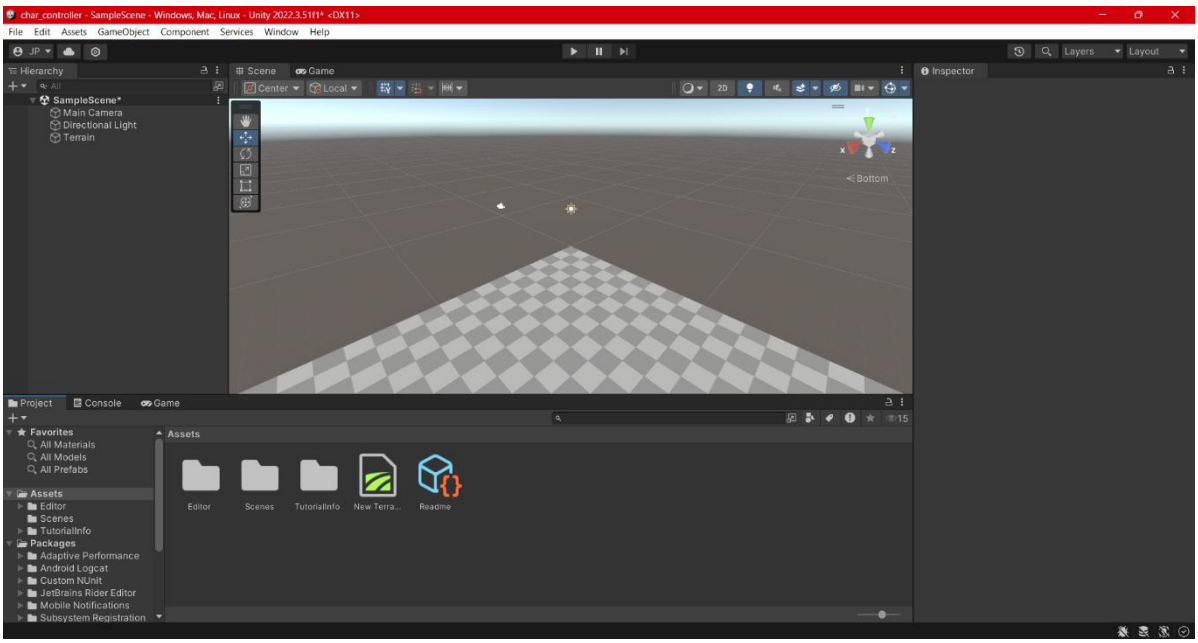


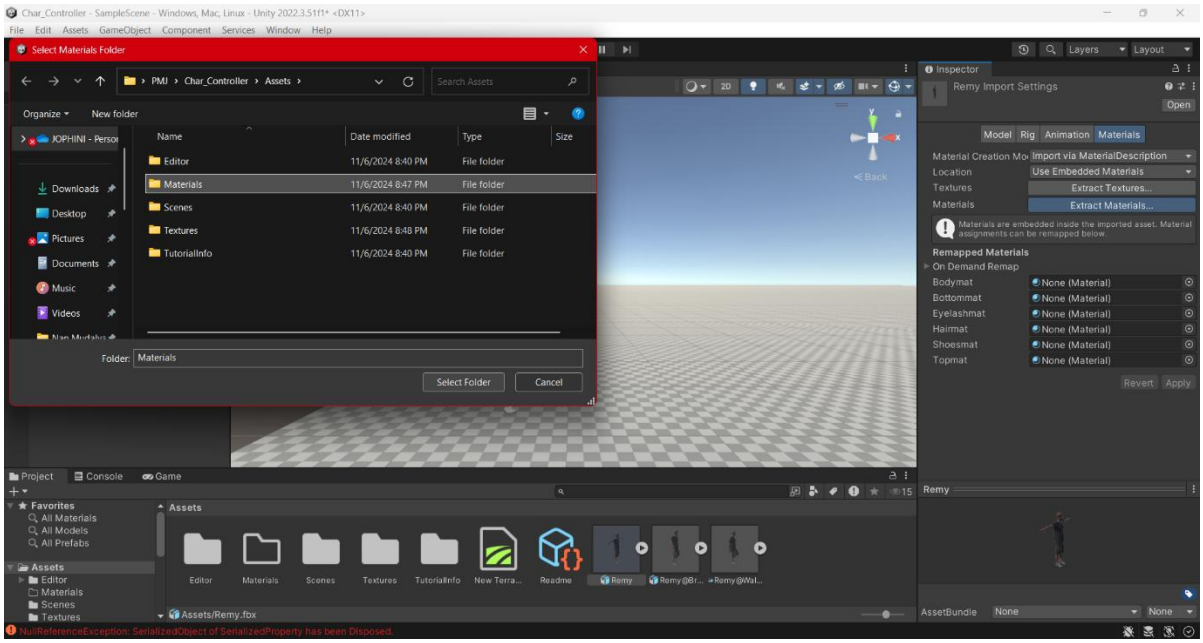
[construct.capx]

PROJECT 2: UNITY - CHARACTER CONTROLLER

- **Tools Used:** Unity, Rigidbody, Animator
- **Features:**
  - Character movement, jumping, and physics simulation
  - Animation transitions using the Animator
  - Smooth third-person camera setup with Cinemachine
- **Outcome:**
  - Functional character controller with smooth animations
  - Future plans: Add advanced character interactions and animation






Char_Controller - SampleScene - Windows, Mac, Linux - Unity 2022.3.51f1* <DX11>
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Select Materials Folder
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Search Assets
Organize
New folder
Name
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Materials 11/6/2024 8:47 PM File folder
Scenes 11/6/2024 8:40 PM File folder
Textures 11/6/2024 8:48 PM File folder
TutorialInfo 11/6/2024 8:40 PM File folder
Downloads
Desktop
Pictures
Documents
Music
Videos
Folder: Materials
Select Folder
Cancel
Inspector
Remy Import Settings
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Model Rig Animation Materials
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Hairmat None (Material)
Shoesmat None (Material)
Topmat None (Material)
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Project Console Game
Favorites
All Materials
All Models
All Prefabs
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Textures
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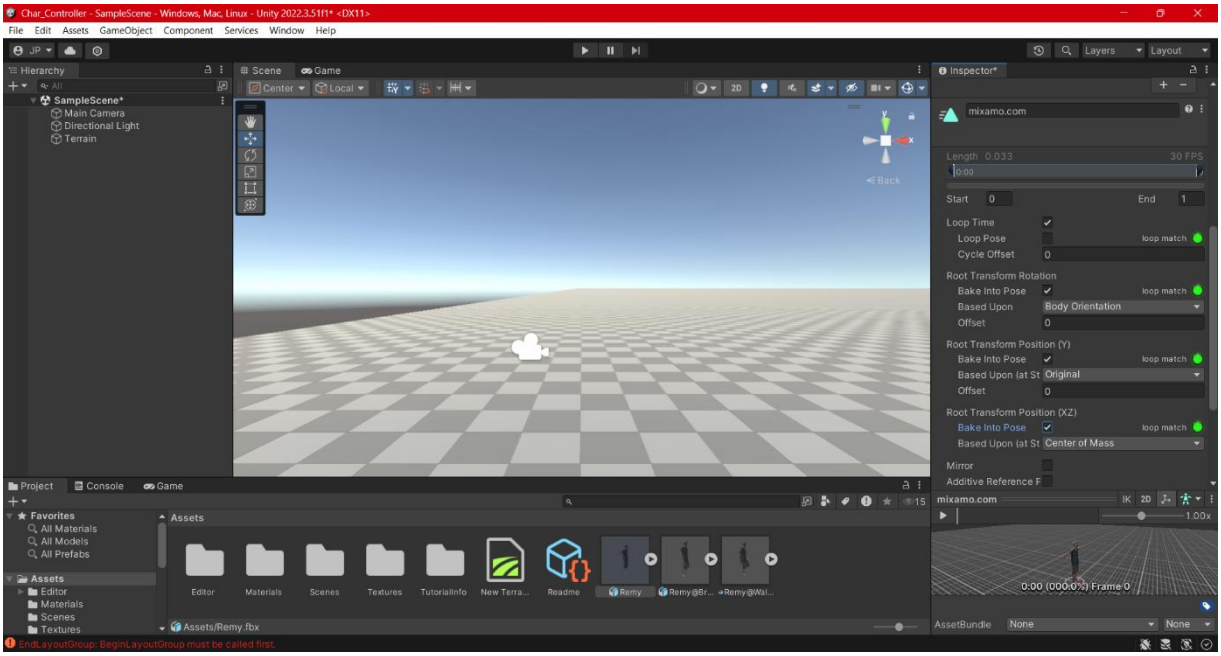
New Terra...
Readme
Remy
Remy@Br...
Remy@Wal...
Assets/Remy.fbx
AssetBundle None None
NullReferenceException: SerializedObject of SerializedProperty has been Disposed.


Char_Controller - SampleScene - Windows, Mac, Linux - Unity 2022.3.51f1* <DX11>
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Directional Light
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Scene Game
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Bake Into Pose loop match
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Assets/Remy.fbx
AssetBundle None None
EndLayoutGroup: BeginLayoutGroup must be called first.

Char_Controller - SampleScene - Windows, Mac, Linux - Unity 2022.3.51f1* <DX11>
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Inspector
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Scale
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Update When Offscre
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Lighting
Cast Shadows On
Receive Shadows
Probes
Light Probes Blend Probes
Reflection Probes Blend Probes
Anchor Override None (Transform)
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Shader Standard Edit...
Add Component
Project Console Game
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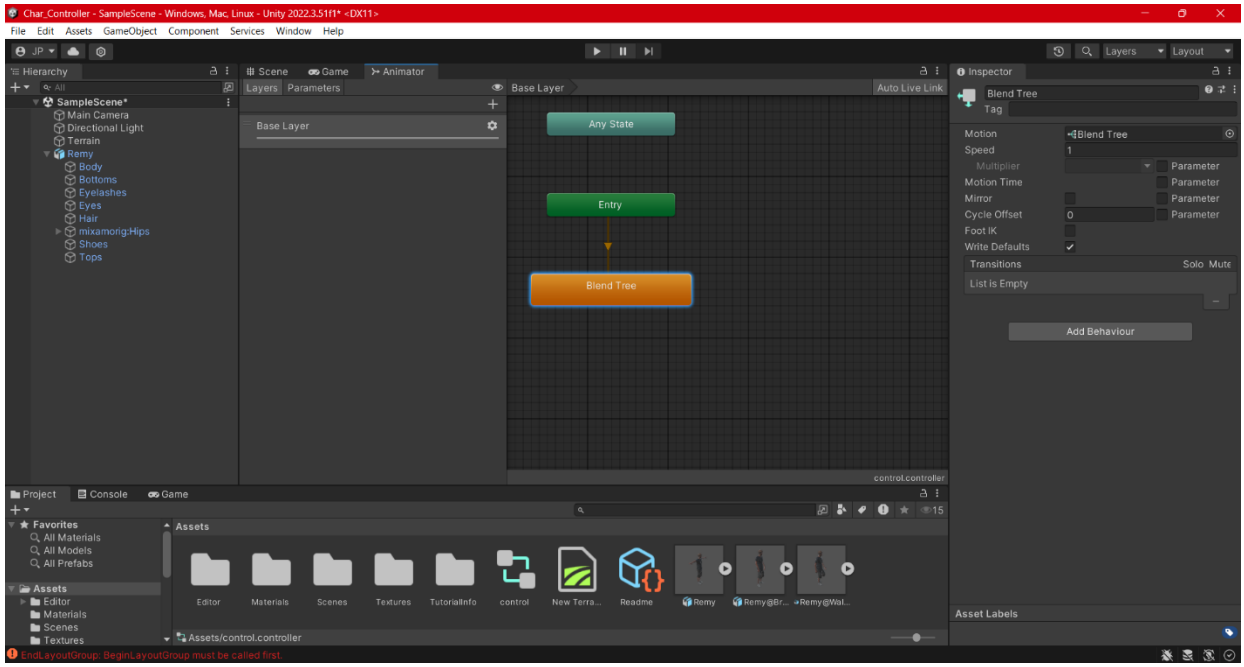
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File Edit Assets GameObject Component Services Window Help
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Inspector
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Motion Time Parameter
Mirror Parameter
Cycle Offset 0 Parameter
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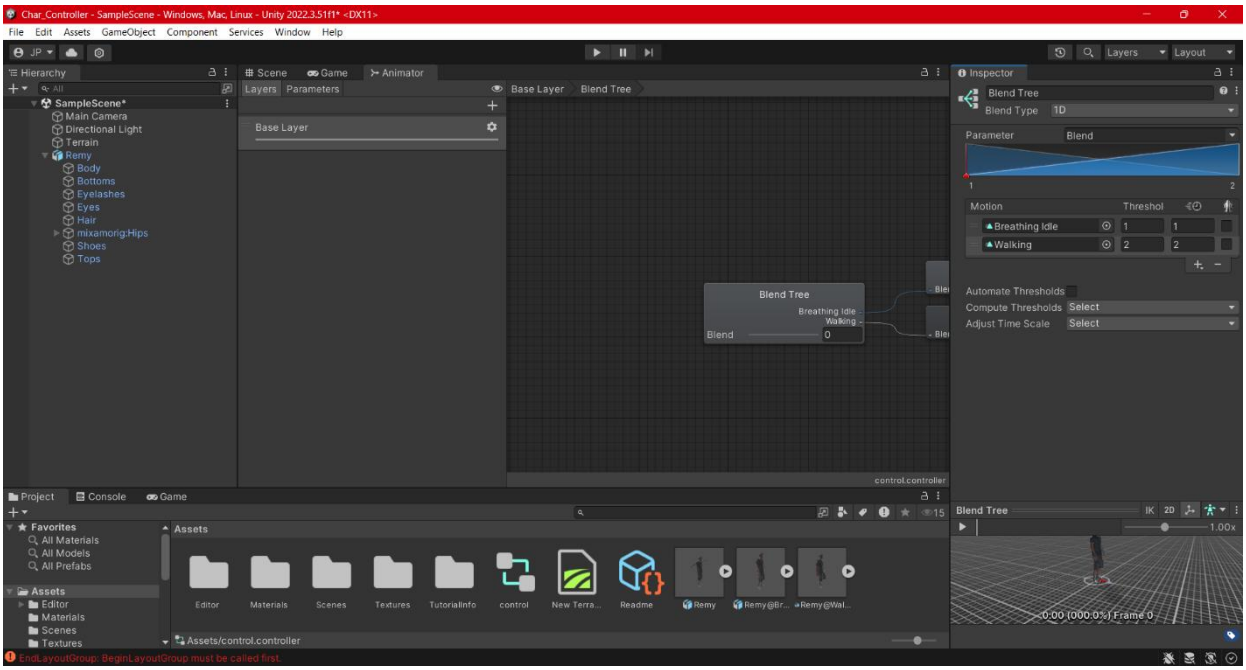
Char_Controller - SampleScene - Windows, Mac, Linux - Unity 2022.3.51f1* <DX11>
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Body
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Eyelashes
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Scene Game Animator
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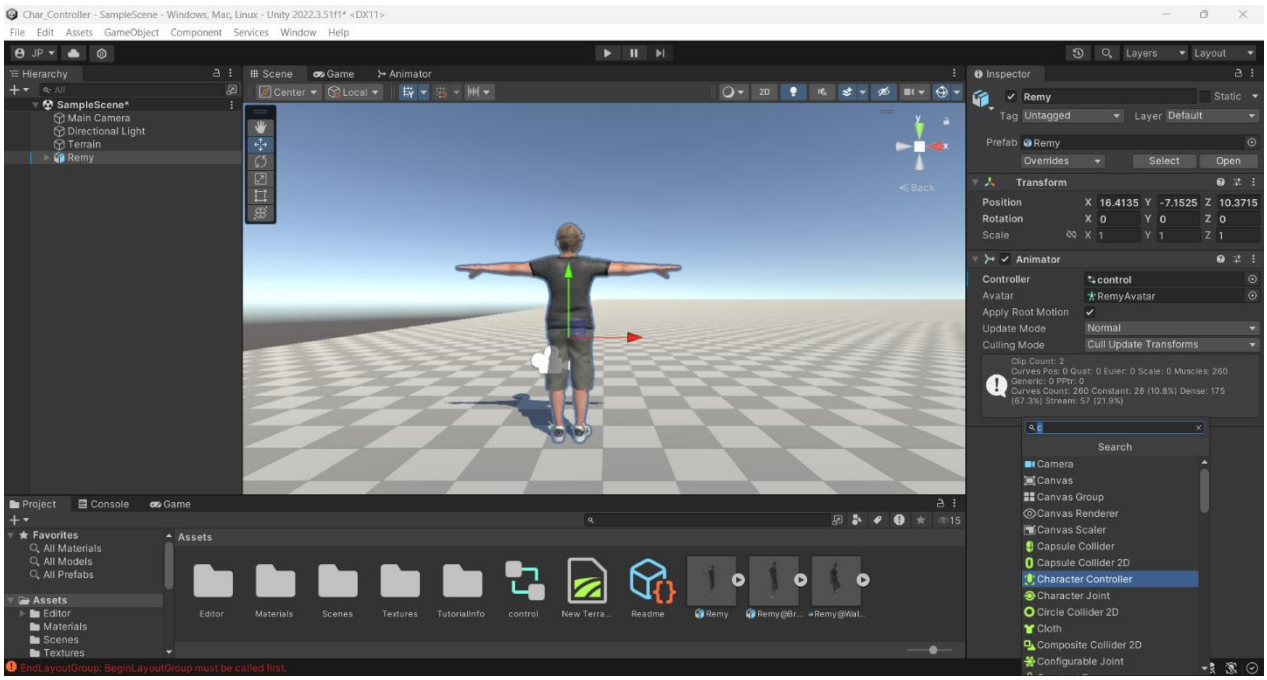
Char_Controller - SampleScene - Windows, Mac, Linux - Unity 2022.3.51f1* <DX11>
File Edit Assets GameObject Component Services Window Help
Hierarchy
SampleScene*
Main Camera
Directional Light
Terrain
Remy
Scene Game Animator
Center Local 2D
Back
Inspector
Remy
Static
Tag Untagged Layer Default
Prefab Remy
Overrides Select Open
Transform
Position X 16.4135 Y -7.1525 Z 10.3715
Rotation X 0 Y 0 Z 0
Scale X 1 Y 1 Z 1
Animator
Controller control
Avatar RemyAvatar
Apply Root Motion
Update Mode Normal
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Search
Camera
Canvas
Canvas Group
Canvas Renderer
Canvas Scaler
Capsule Collider
Capsule Collider 2D
Character Controller
Character Joint
Circle Collider 2D
Cloth
Composite Collider 2D
Configurable Joint
Project Console Game
Favorites
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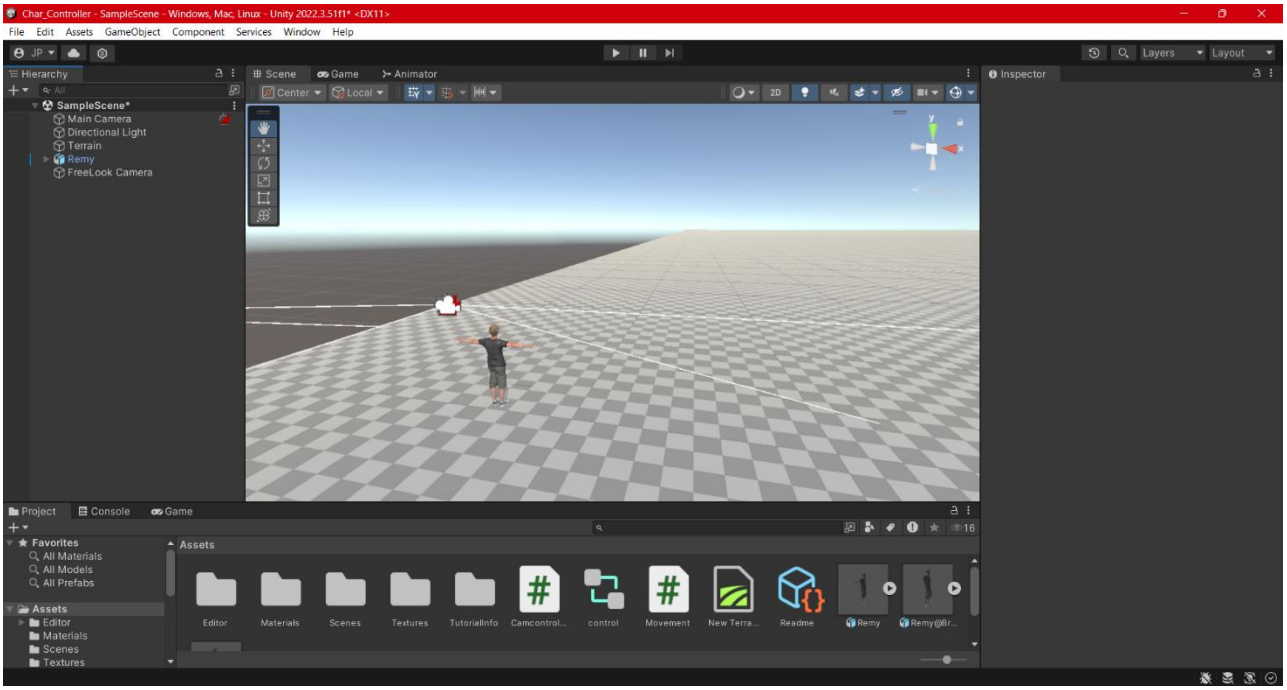
Char_Controller - SampleScene - Windows, Mac, Linux - Unity 2022.3.51f1* <DX11>
File Edit Assets GameObject Component Services Window Help
Hierarchy
SampleScene*
Main Camera
Directional Light
Terrain
Remy
FreeLook Camera
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Animator
Inspector
Project
Console
Favorites
All Materials
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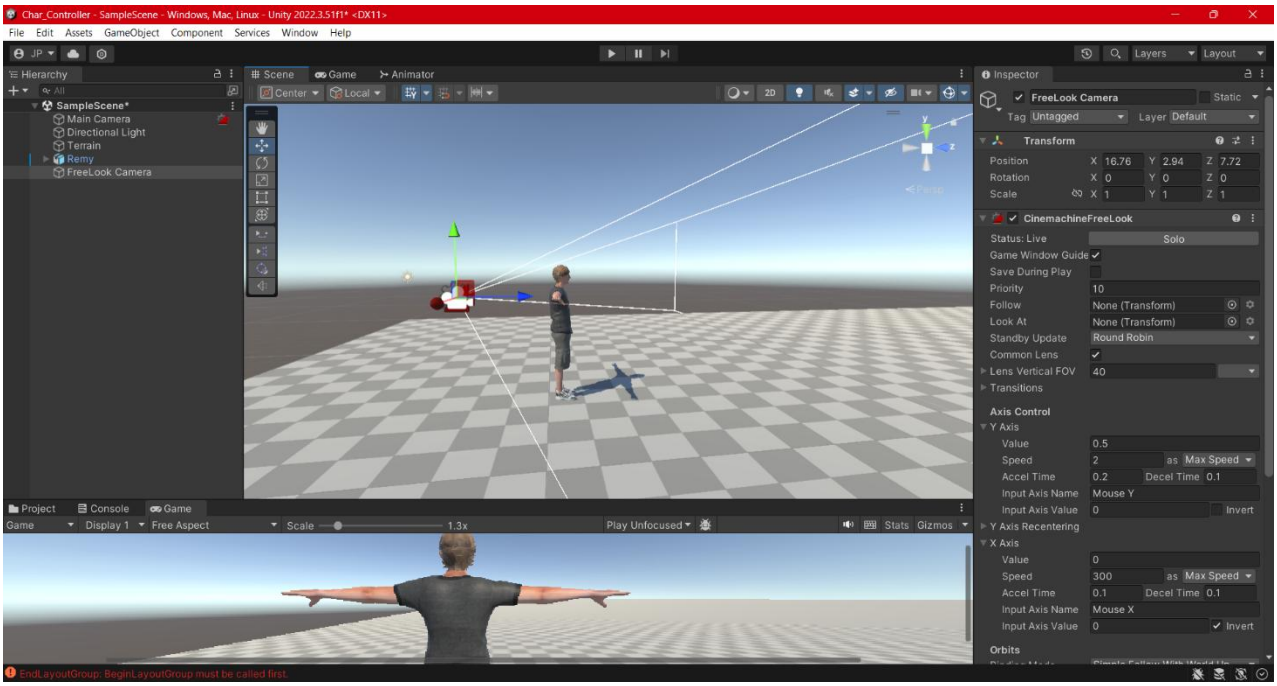
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FreeLook Camera
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Animator
Inspector
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Status: Live
Solo
Game Window Guide
Save During Play
Priority
Follow
Look At
Standby Update
Round Robin
Common Lens
Lens Vertical FOV
Transitions
Axis Control
Y Axis
Value
Speed
Accel Time
Decel Time
Input Axis Name
Mouse Y
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Invert
Y Axis Recentering
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Free Aspect
Play Unfocused
Stats
Gizmos
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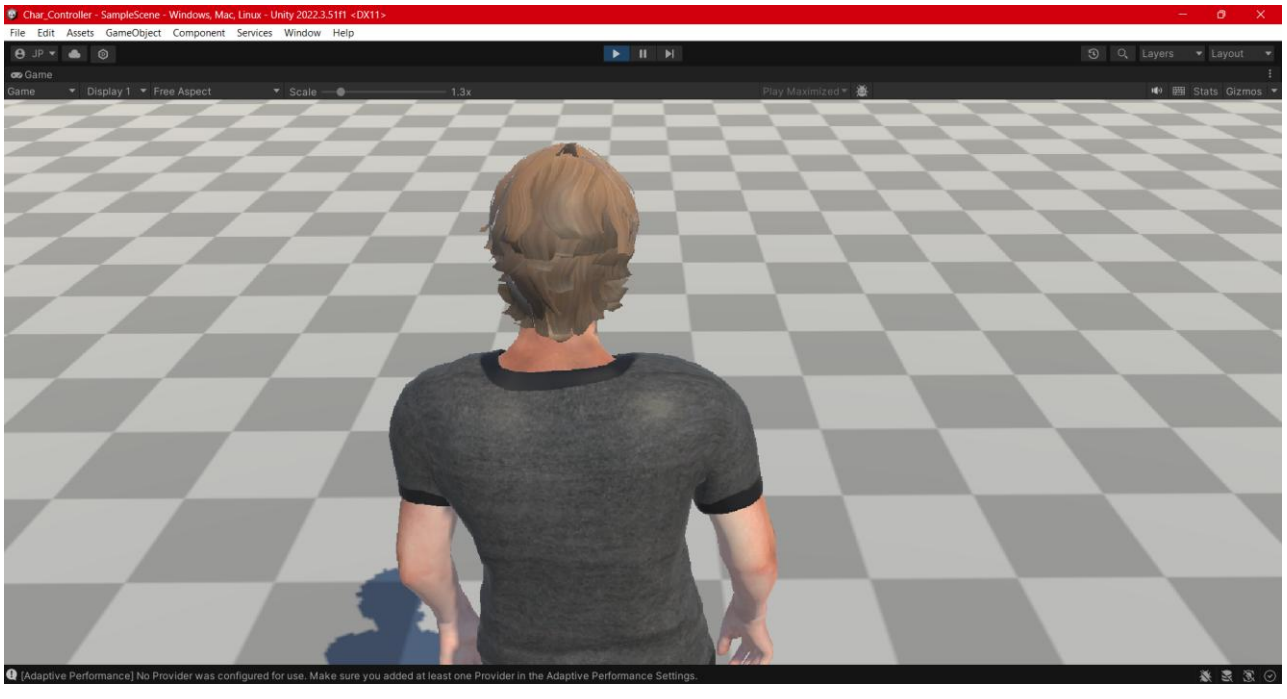
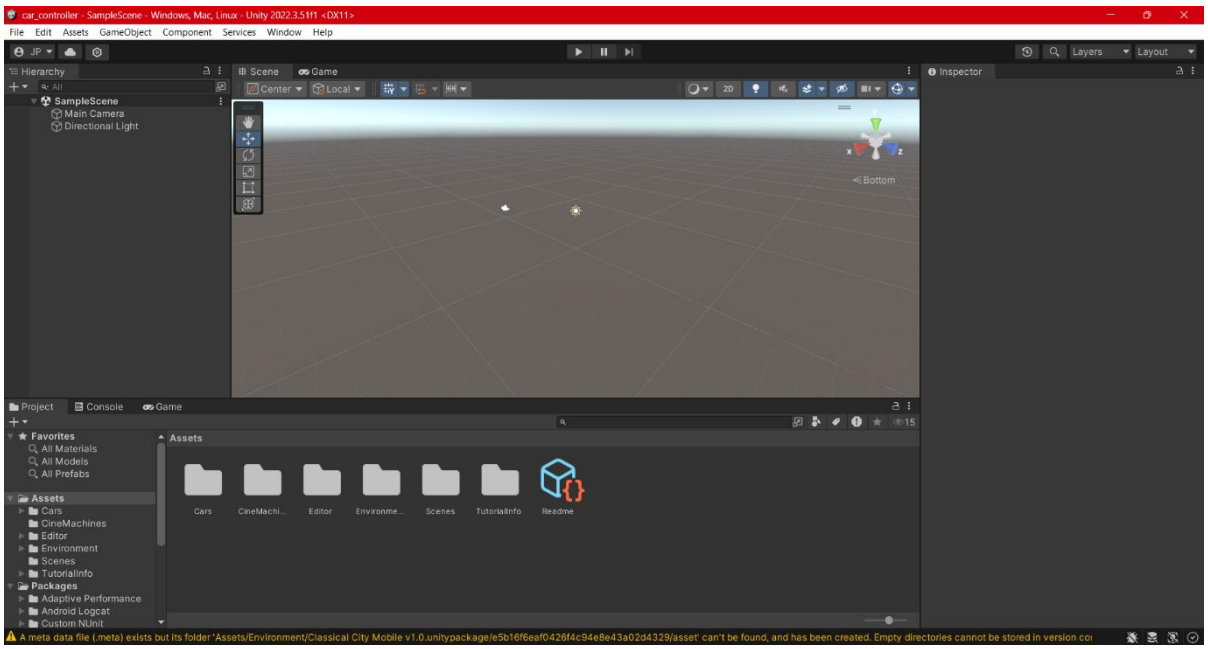
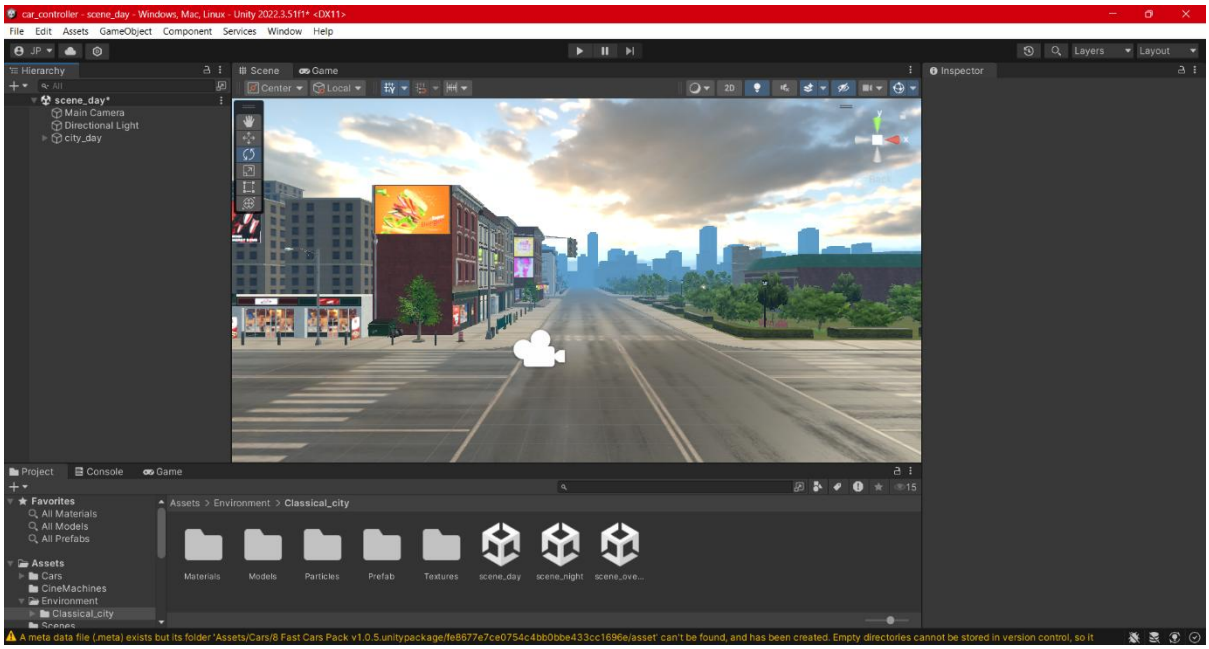
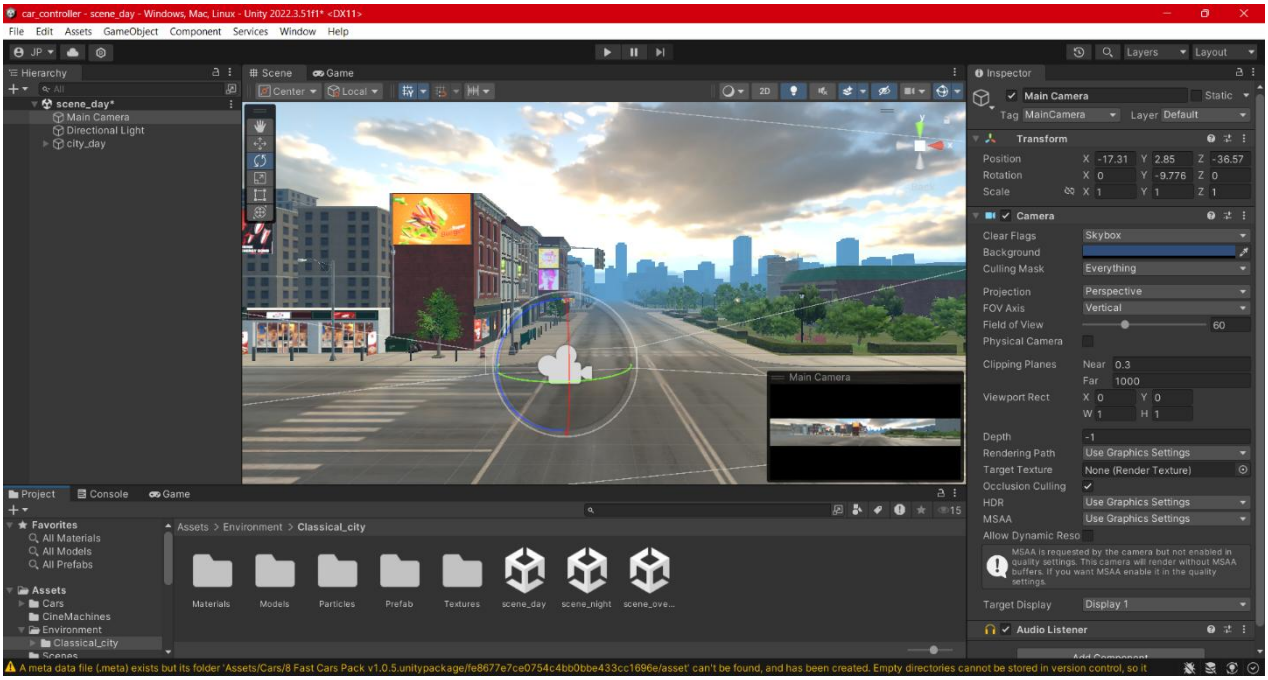

Char_Controller - SampleScene - Windows, Mac, Linux - Unity 2022.3.51f1 <DX11>
File Edit Assets GameObject Component Services Window Help
Game
Display 1
Free Aspect
Play Maximized
Stats
Gizmos
[Adaptive Performance] No Provider was configured for use. Make sure you added at least one Provider in the Adaptive Performance Settings.

PROJECT 3: UNITY - CAR CONTROLLER

- **Tools Used**: Unity, Cinemachine, WheelCollider
- **Features**:
    - Realistic car physics (acceleration, braking, steering)
    - Suspension and wheel physics with WheelCollider
    - Third-person camera setup with Cinemachine
- **Outcome:**
    - Realistic car movement and handling
    - Future plans: Add drifting, AI cars, and advanced features






car_controller - scene_day - Windows, Mac, Linux - Unity 2022.3.51f1* <DX11>
File Edit Assets GameObject Component Services Window Help
Hierarchy
scene_day*
Main Camera
Directional Light
city_day
Scene
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Main Camera
Transform
Camera
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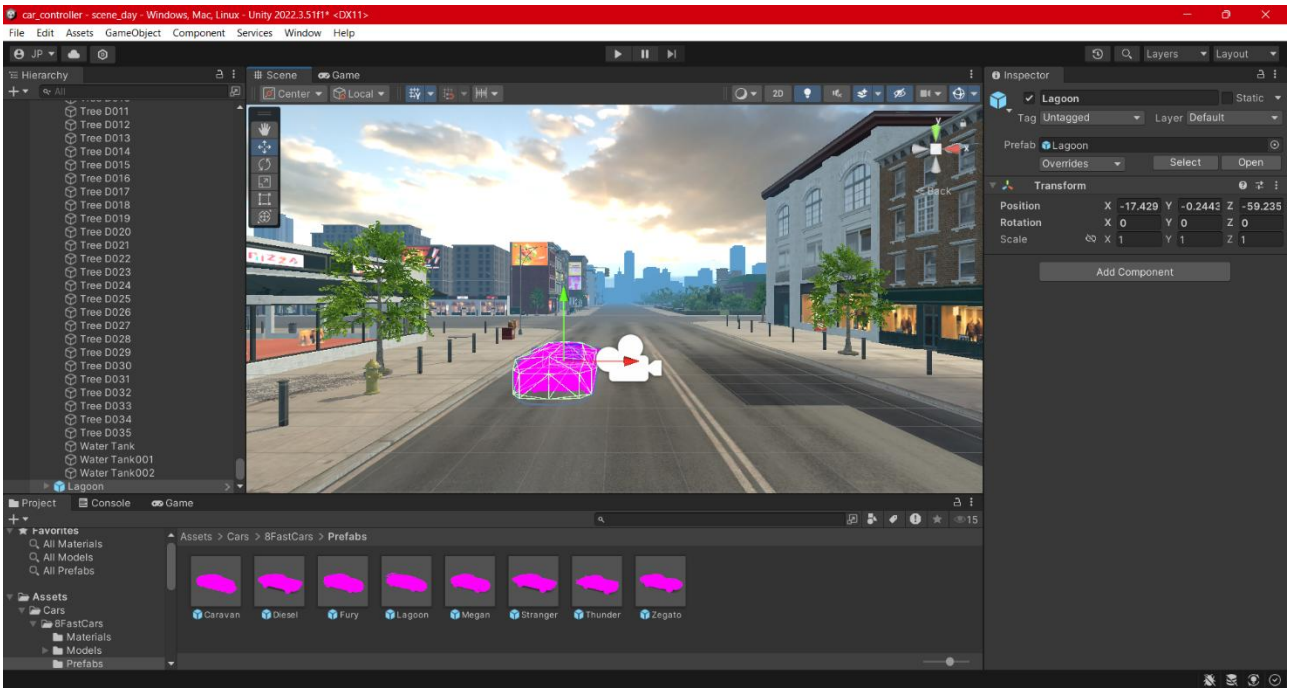
Console
Assets > Environment > Classical_city
Materials
Models
Particles
Prefab
Textures
scene_day
scene_night
A meta data file (.meta) exists but its folder 'Assets/Cars/8 Fast Cars Pack v1.0.5.unitypackage/fe8677e7ce0754c4bb0bbe433cc1696e/asset' can't be found, and has been created. Empty directories cannot be stored in version control, so it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File Edit Assets GameObject Component Services Window Help
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Water Tank
Water Tank001
Water Tank002
Lagoon
Scene
Game
Inspector
Lagoon
Transform
Add Component
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Assets > Cars > 8FastCars > Prefabs
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car_controller - scene_day - Windows, Mac, Linux - Unity 2022.3.51f1* <DX11>
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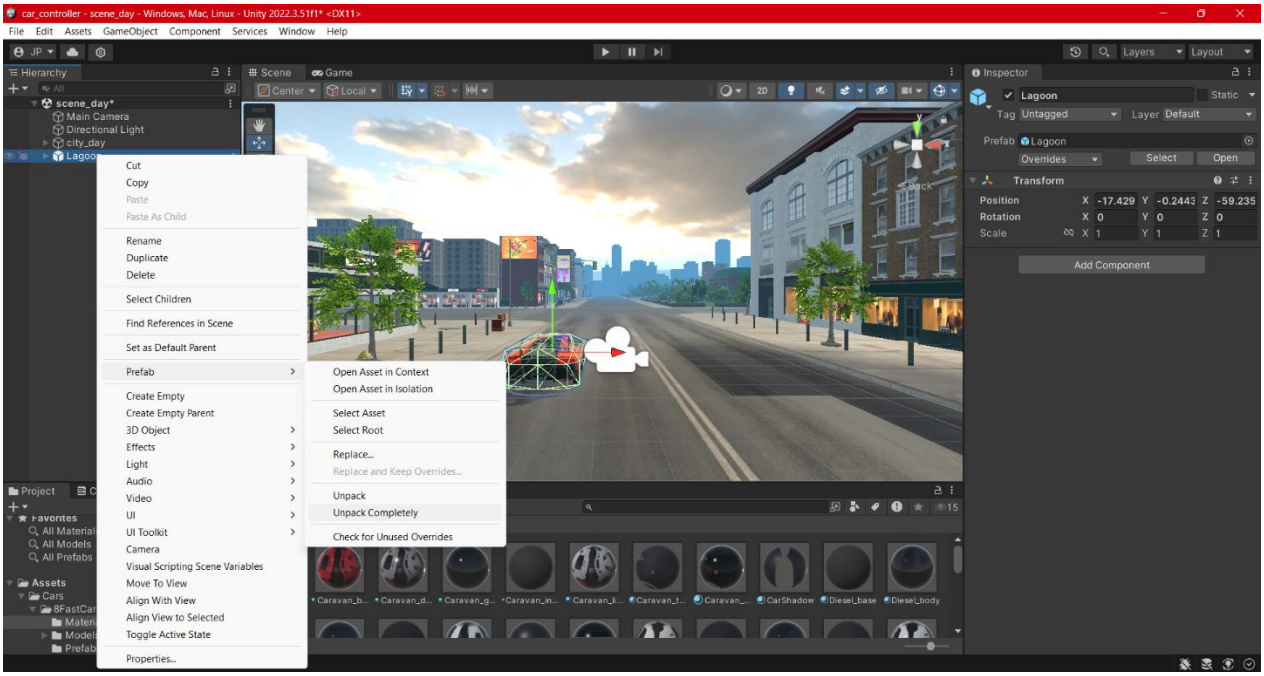
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File Edit Assets GameObject Component Services Window Help
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Find References in Scene
Set as Default Parent
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Create Empty
Create Empty Parent
3D Object
Effects
Light
Audio
Video
UI
UI Toolkit
Camera
Visual Scripting Scene Variables
Move To View
Align With View
Align View to Selected
Toggle Active State
Properties...
Open Asset in Context
Open Asset in Isolation
Select Asset
Select Root
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Replace and Keep Overrides...
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Inspector
Lagoon
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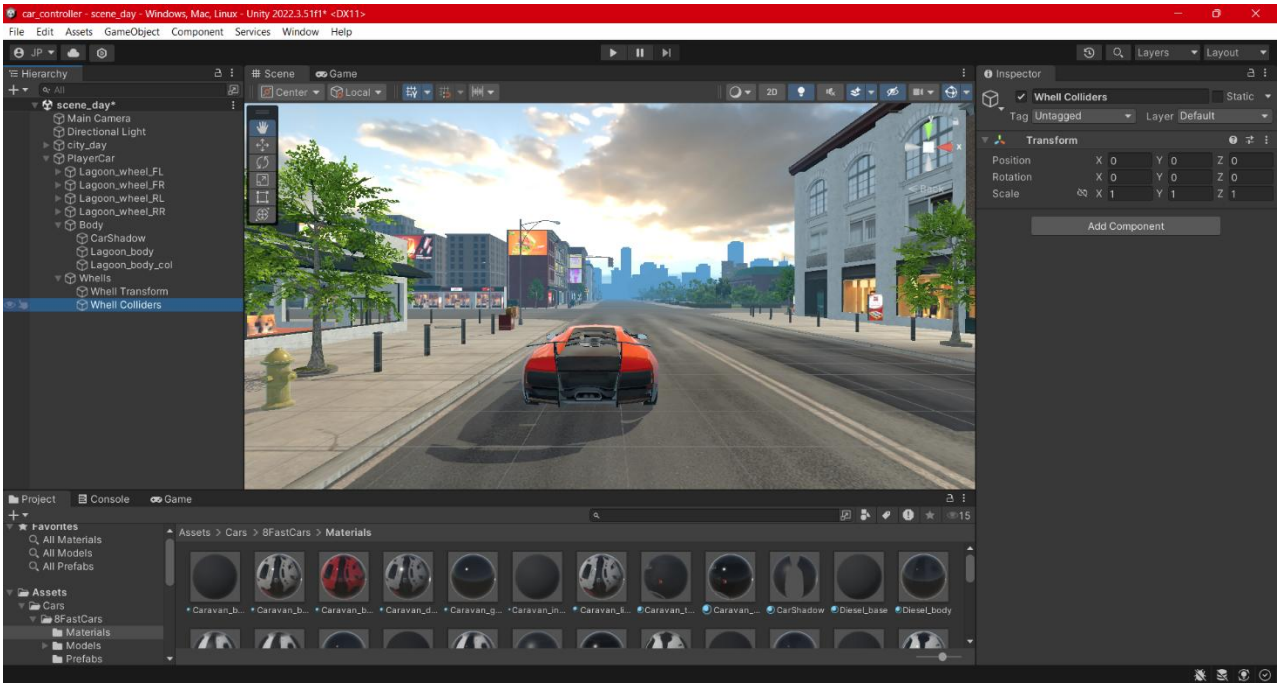
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Mesh Renderer
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Lighting
Cast Shadows On
Receive Shadows
Probes
Light Probes Blend Probes
Reflection Probes Blend Probes
Anchor Override None (Transform)
Additional Settings
Motion Vectors Per Object Motion
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Shader Nature/SpeedTree8
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car_controller - scene_day - Windows, Mac, Linux - Unity 2022.3.51f1* <DX11>
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Interpolate None
Collision Detection Continuous Dynamic
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Layer Overrides
Box Collider
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Provides Contacts
Material None (Physic Material)
Center
Size
Layer Overrides
Add Component
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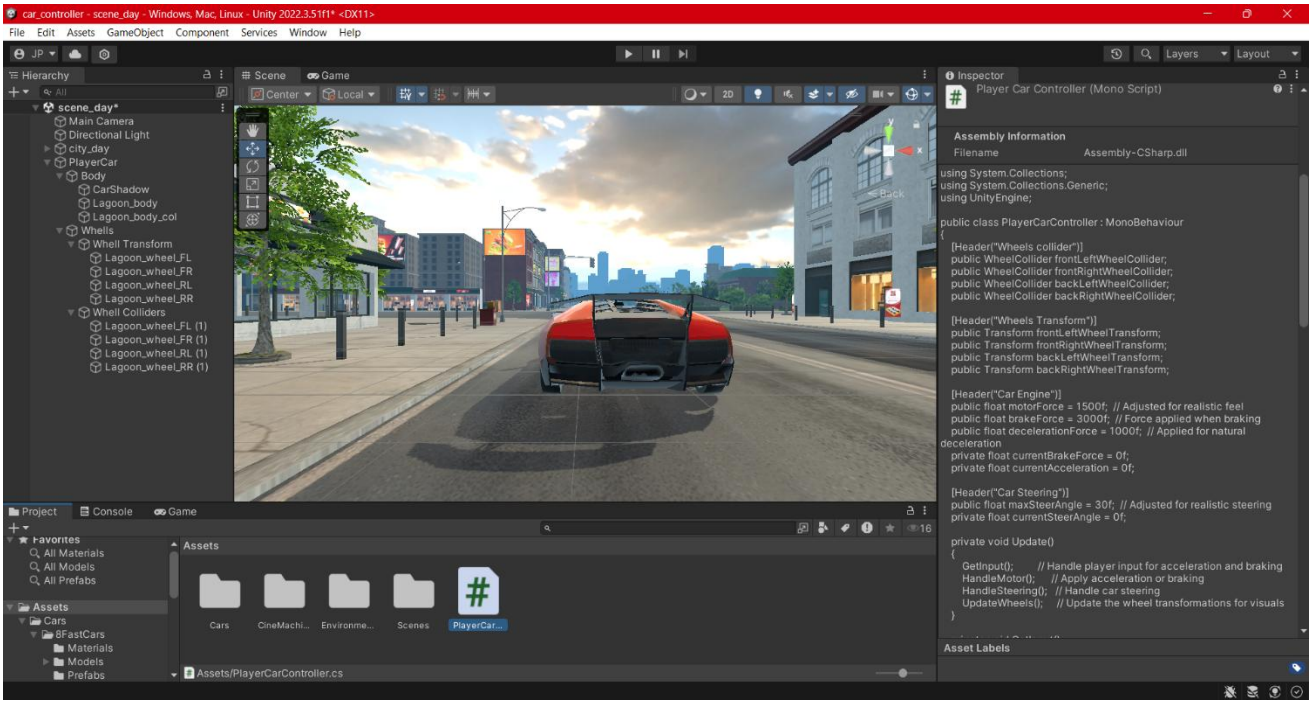
Assets > Cars > 8FastCars > Materials


car_controller - scene_day - Windows, Mac, Linux - Unity 2022.3.51f1* <DX11>
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Directional Light
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Lagoon_body
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Lagoon_wheel_RL
Lagoon_wheel_RR
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Lagoon_wheel_FL (1)
Lagoon_wheel_FR (1)
Lagoon_wheel_RL (1)
Lagoon_wheel_RR (1)
Scene
Game
Inspector
Player Car Controller (Mono Script)
Assembly Information
Filename Assembly-CSharp.dll
using System.Collections;
using System.Collections.Generic;
using UnityEngine;
public class PlayerCarController : MonoBehaviour
{
[Header("Wheels collider")]
public WheelCollider frontLeftWheelCollider;
public WheelCollider frontRightWheelCollider;
public WheelCollider backLeftWheelCollider;
public WheelCollider backRightWheelCollider;
[Header("Wheels Transform")]
public Transform frontLeftWheelTransform;
public Transform frontRightWheelTransform;
public Transform backLeftWheelTransform;
public Transform backRightWheelTransform;
[Header("Car Engine")]
public float motorForce = 1500f; // Adjusted for realistic feel
public float brakeForce = 3000f; // Force applied when braking
public float decelerationForce = 1000f; // Applied for natural deceleration
private float currentBrakeForce = 0f;
private float currentAcceleration = 0f;
[Header("Car Steering")]
public float maxSteerAngle = 30f; // Adjusted for realistic steering
private float currentSteerAngle = 0f;
private void Update()
{
GetInput(); // Handle player input for acceleration and braking
HandleMotor(); // Apply acceleration or braking
HandleSteering(); // Handle car steering
UpdateWheels(); // Update the wheel transformations for visuals
}
Asset Labels
Project
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Game
Favorites
All Materials
All Models
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8FastCars
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Cars
CineMachi...
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Scenes
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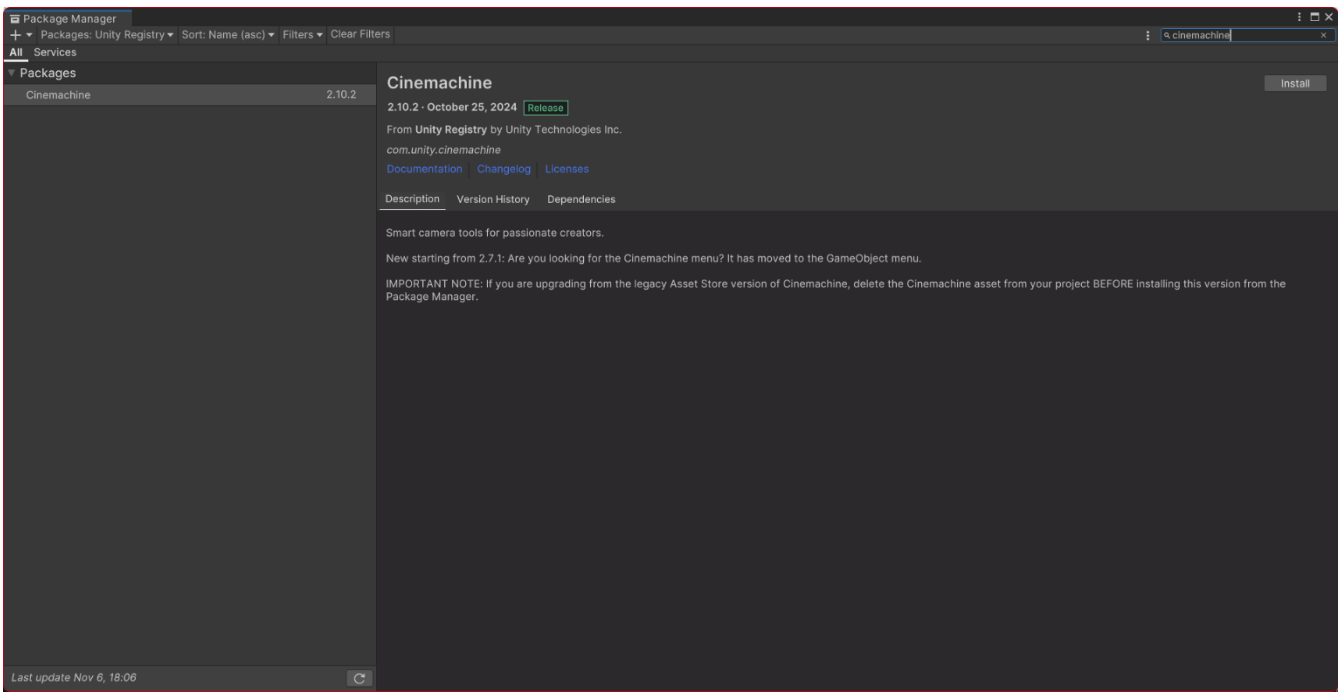
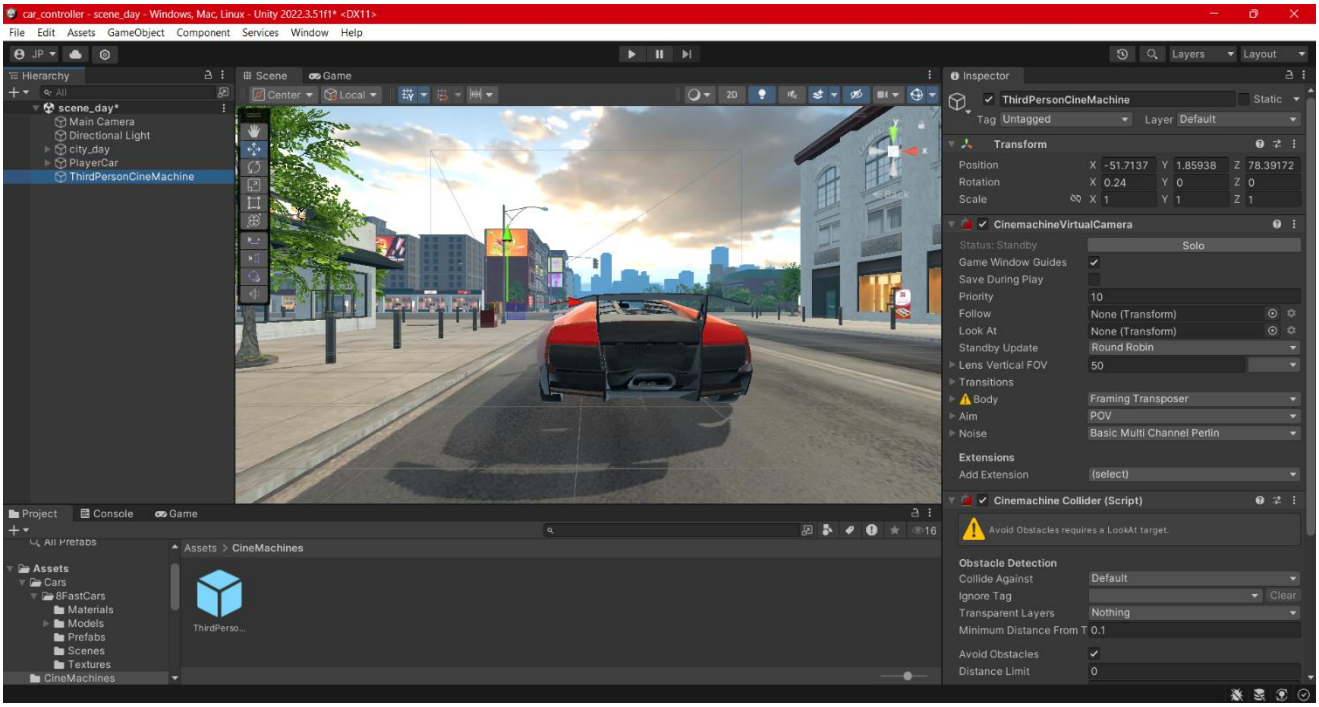
Assets/PlayerCarController.cs


Package Manager
Packages: Unity Registry
Sort: Name (asc)
Filters
Clear Filters
cinemachine
All
Services
Packages
Cinemachine 2.10.2
Cinemachine
2.10.2 - October 25, 2024
Release
Install
From Unity Registry by Unity Technologies Inc.
com.unity.cinemachine
Documentation
Changelog
Licenses
Description
Version History
Dependencies
Smart camera tools for passionate creators.
New starting from 2.7.1: Are you looking for the Cinemachine menu? It has moved to the GameObject menu.
IMPORTANT NOTE: If you are upgrading from the legacy Asset Store version of Cinemachine, delete the Cinemachine asset from your project BEFORE installing this version from the Package Manager.
Last update Nov 6, 18:06


car_controller - scene_day - Windows, Mac, Linux - Unity 2022.3.51f1* <DX11>
File Edit Assets GameObject Component Services Window Help
Hierarchy
scene_day*
Main Camera
Directional Light
city_day
PlayerCar
ThirdPersonCineMachine
Scene
Game
Inspector
ThirdPersonCineMachine
Tag Untagged
Layer Default
Transform
Position X -51.7137 Y 1.85938 Z 78.39172
Rotation X 0.24 Y 0 Z 0
Scale X 1 Y 1 Z 1
CinemachineVirtualCamera
Status: Standby
Solo
Game Window Guides
Save During Play
Priority 10
Follow None (Transform)
Look At None (Transform)
Standby Update Round Robin
Lens Vertical FOV 50
Transitions
Body Framing Transposer
Aim POV
Noise Basic Multi Channel Perlin
Extensions
Add Extension (select)
Cinemachine Collider (Script)
Avoid Obstacles requires a LookAt target.
Obstacle Detection
Collide Against Default
Ignore Tag Clear
Transparent Layers Nothing
Minimum Distance From T 0.1
Avoid Obstacles
Distance Limit 0
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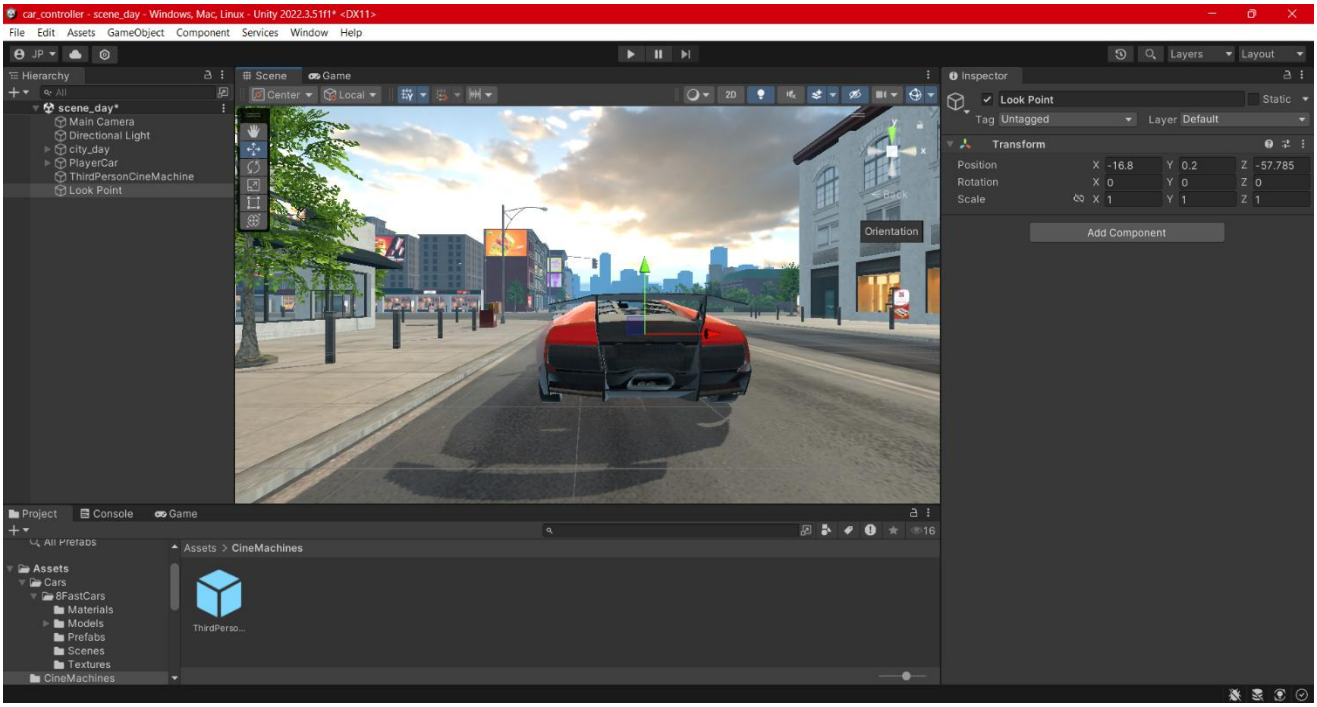
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Orientation
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Look Point
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Rotation X 0 Y 0 Z 0
Scale X 1 Y 1 Z 1
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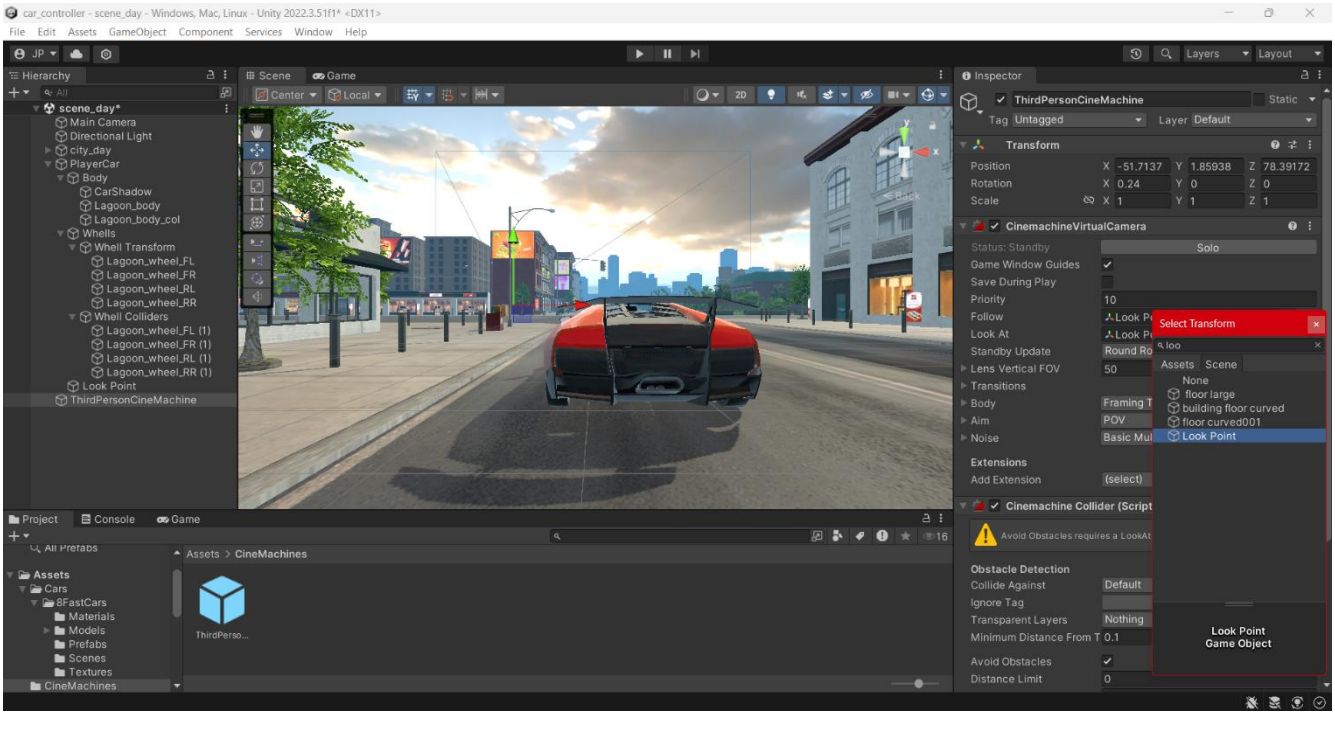
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CarShadow
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Lagoon_body_col
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Wheel Transform
Lagoon_wheel_FL
Lagoon_wheel_FR
Lagoon_wheel_RL
Lagoon_wheel_RR
Wheel Colliders
Lagoon_wheel_FL (1)
Lagoon_wheel_FR (1)
Lagoon_wheel_RL (1)
Lagoon_wheel_RR (1)
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Game Window Guides
Save During Play
Priority 10
Select Transform
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building floor curved
floor curved001
Look Point
Look Point
Game Object
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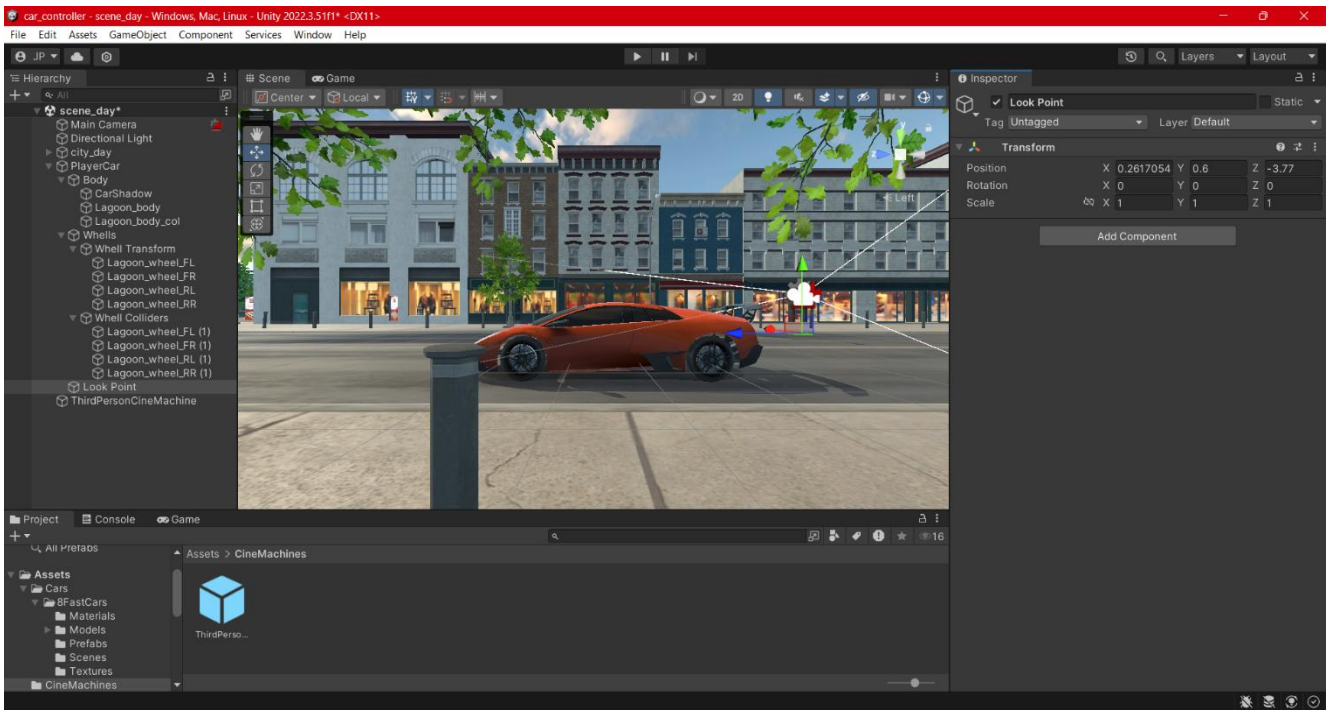
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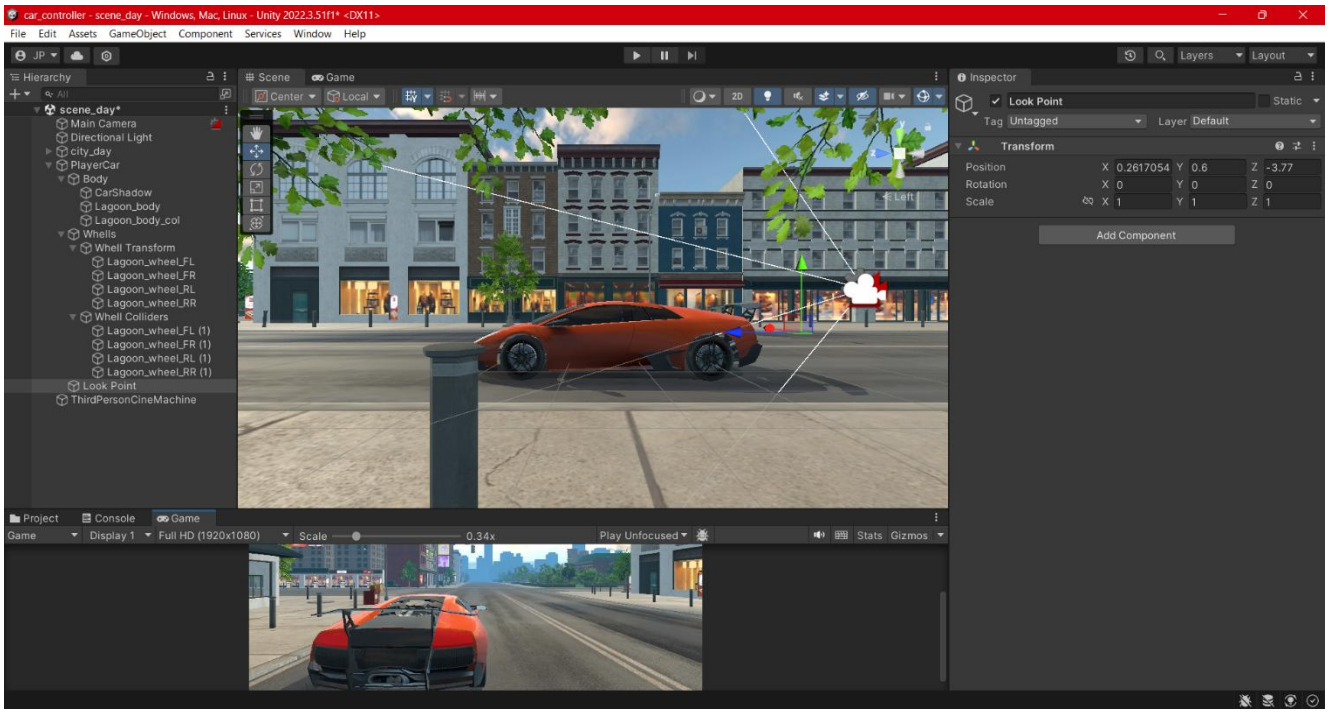
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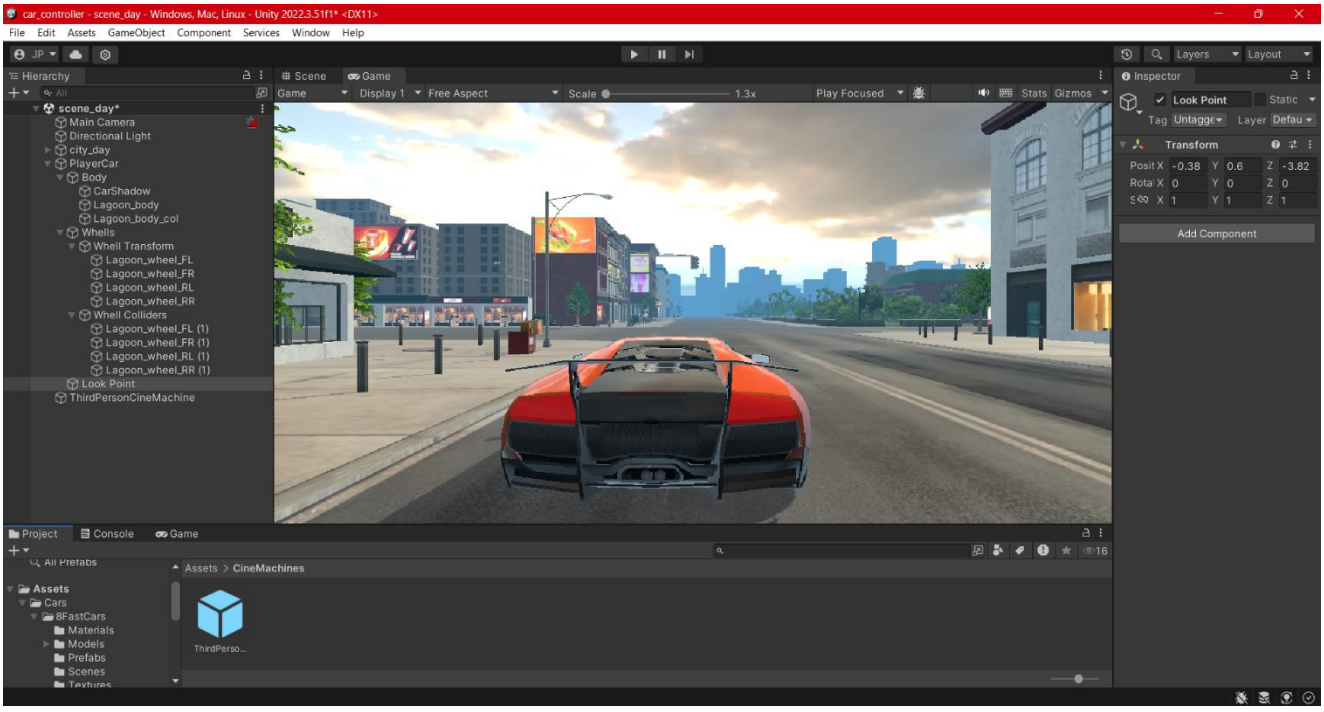
Game Display 1 Full HD (1920x1080) Scale 0.34x Play Unfocused Stats Gizmos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Lagoon_wheel_RL (1)
Lagoon_wheel_RR (1)
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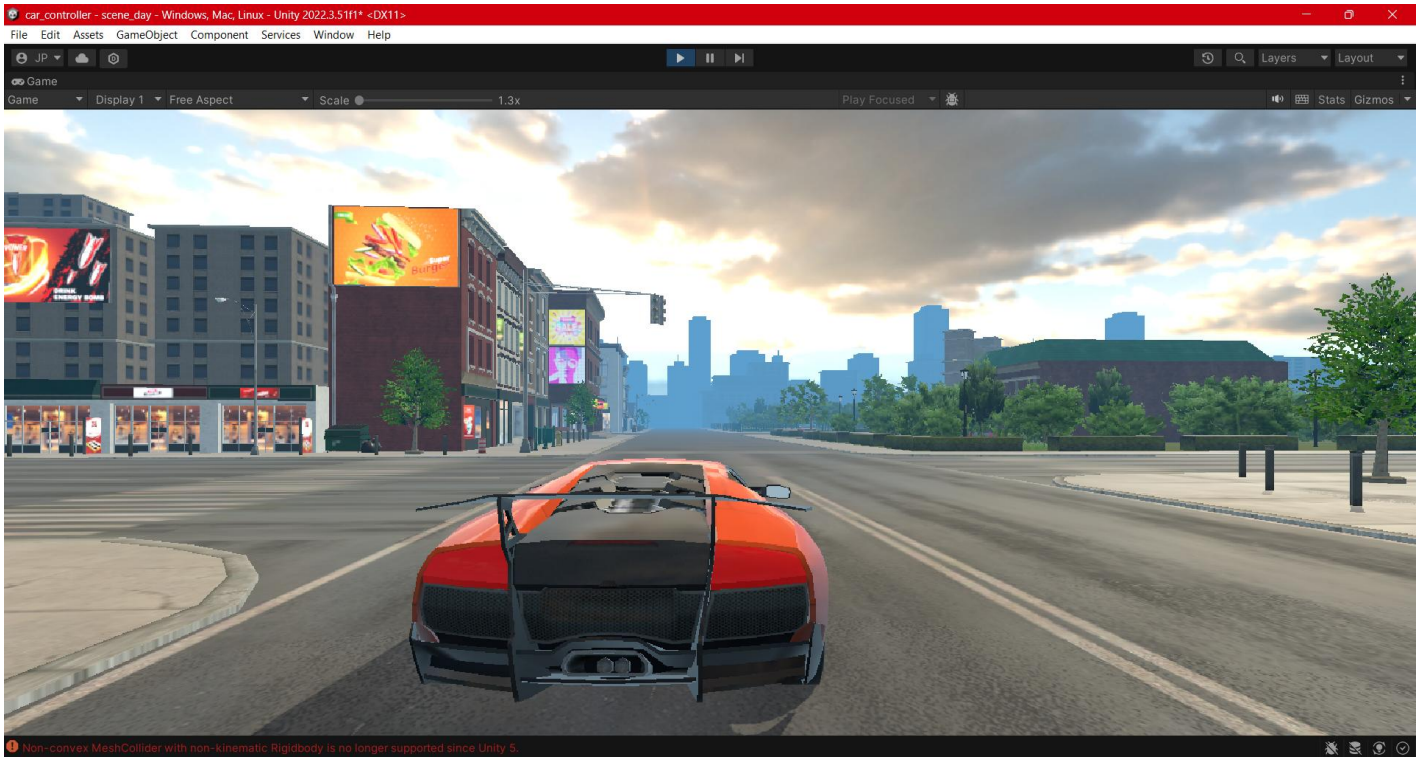

car_controller.mp4

car_controller

CONCLUSION

These projects have strengthened my game development skills in both 2D and 3D environments. The Construct 2 platformer improved my understanding of basic game mechanics, while the Unity Character Controller (Remy) deepened my knowledge of 3D movement, physics, and animation. The Unity Car Controller introduced me to advanced vehicle physics and camera control.