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| **Department of Computer and Software Engineering – ITU** |
| **MD442: Mobile Application and Development** |

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| **Course Instructor: Usama Bin Shakeel** | **Dated: 02/05/2025** |
| **Teaching Assistant: Syed Abdul Rahman Ahsan** | **Semester: Spring 2025** |
| **Teaching Assistant: Hammad Kamran, Hateem Hassan** | **Batch: BSCE2021 & BSEE2021** |

# **Assignment #7: Car Racing Game & URP**

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| **Name** | **Roll number** | **Obtained Marks/35** |
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Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Submission:**

• Email instructor and team, if there are any questions. Plagiarism will be dealt with according to the course policy.

Instructor’s email: [ubs@itu.edu.pk](mailto:ubs@itu.edu.pk)

Teaching Assistant’s: [bsce20029@itu.edu.pk](mailto:bsce20029@itu.edu.pk), [bsce20039@itu.edu.pk](mailto:bsce20039@itu.edu.pk), bsee20063@itu.edu.pk

**• Submission after due time will not be accepted.**

# **Car Racing Game & URP**

1. **Universal Render Pipeline.**
2. **SpeedX Racing Game:**

## **Objective**

## In this lab, you will implement a Racing Game using Realistic Car Controller (RCC) in Unity. You’ll learn to set up the player-controlled car, configure AI opponents, and build the racing game mechanics including lap counting, win conditions, and UI.

## **Tasks Overview:**

**Task 1: How to Use Car Controller**

* Import the Environment
* In Lab12 assert we have an environment, player and enemies cars fbx.

**Set Up the RCC Car for Player Control**

* import RCC (Realistic Car Controller) from the given package into your project.
* Set Up the Player Car:
* Setup the RCC\_CarController prefab into your scene (e.g., RCC\_CarControllerV3).

**Make sure the car has:**

* Rigidbody component (for physics).
* Wheel Colliders (for correct wheel simulation).
* RCC\_CarControllerV3 script (handles car behavior).

**Player Controls:**

* By default, RCC supports WASD and Arrow keys for car movement.
* Customize the input settings in RCC\_Settings if needed.
* The car will accelerate, brake, and steer based on keyboard input.

**Camera Setup:**

* Drag the RCC\_Camera prefab into the scene.
* The camera will follow the car automatically. You can set the camera’s Follow Target to the car.
* Optional: Allow players to switch between camera views (e.g., chase cam, first-person) using the C key.

**Adjusting Car Physics:**

* Tune engine power, brake force, steering angle, and other values to match your desired gameplay experience.
* Modify traction control and stability to help with car handling.

**Audio:**

* RCC includes engine sound and tire skids. Attach Audio Sources for these effects.
* Optional: Add background music by attaching another Audio Source to the scene.

**Task 2:**

Winning Condition:

* When the player completes the win condition by completing lap/around.
* Show the total time taken and allow the player to restart the race or go back to the main menu.
* Save Best Time:
* Use PlayerPrefs to save the best lap time, and load it for display in the race finish screen

**Assessment Rubric**

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| **Performance metric** | **CLO** | **Able to complete the task over 80% (4-5)** | **Able to complete the task 50-80% (2-3)** | **Able to complete the task below 50% (0-1)** | **Marks** |
| 1. Realization of experiment | 3 | Executes without errors excellent user prompts, good use of symbols, spacing in output. The testing has been completed. | Executes without errors, user prompts are understandable, minimum use of symbols or spacing in output. Some testing has been completed. | Does not execute due to syntax errors, runtime errors, user prompts are misleading or non- existent. No testing has been completed. |  |
| 1. Conducting experiment | 2 | Able to make changes and answer all questions. | Partially able to make changes and few incorrect answers. | Unable to make changes and answer all questions. |  |
| 1. Computer use | 4 | Document submission timely. | Document submission late. | Document submission not done. |  |
| 1. Teamwork | 4 | Actively engages and cooperates with other group member(s) in an effective manner. | Cooperates with other group member(s) in a reasonable manner but conduct can be improved. | Distracts or discourages other group members from conducting the experiment |  |
| 1. Laboratory safety and disciplinary rules | 2 | Code comments are added and do help the reader to understand the code. | Code comments are added and do not help the reader to understand the code. | Code comments are not added. |  |
| 1. Data collection | 2 | Excellent use of white space, creatively organized work, excellent use of variables and constants, correct identifiers for constants, No line-wrap. | Includes name, and assignment, white space makes the program fairly easy to read. Title, organized work, good use of variables. | Poor use of white space (indentation, blank lines) making code hard to read, disorganized and messy. |  |
| 1. Data analysis | 3 | Solution is efficient, easy to understand, and maintain. | A logical solution that is easy to follow but it is not the most efficient. | A difficult and inefficient solution. |  |
| **Total (out of 35):** | | | | |  |