GARDEN CITY UNIVERSITY
EMPHASIS ON LIFE

# Xtreme Racing - Game Development Project Report

## TEAM MEMBERS


**Design Phase:**

- **Prerana Yadav (22BTAI105)**
- **Aishwarya D (22BTAI130)**
- **Mohammed Maaz (22BTAI135)**
- **Harshit Trivedi (22BTAI143)**
- **Preeti Patel (22BTAI197)**

**Execution Phase:**

- **Muktha R (22BTAI102)**
- **Esrat Tahin (22BTAI106)**
- **Shirish Upadhyay (22BTAI119)**
- **Sayan Chaki (22BTAI160)**
- **Darshan Sajjan (22BTAI179)**

# 1. Introduction

**Xtreme Racing** is a 3D racing game developed using **Unreal Engine 5**. The project aims to deliver an immersive gaming experience featuring high-quality visuals, dynamic racing mechanics, and intuitive user interface components. It was developed as a group project showcasing core competencies in game design, development, and visual effects.

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# 2. Tools and Technologies

- **Unreal Engine 5:** Main development engine.
- **Blender:** For modeling custom car assets.
- **Epic Games Launcher:** For installing and updating UE5.
- **Blueprint System:** Visual scripting system for logic without manual coding.

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# 3. Game Overview

The game includes:

- Realistic car physics and terrain interaction.
- Checkpoint-based gameplay with lap timing.
- Polished UI system including HUD and menus.

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# 4. Game Development Phases

### Design Phase

- **Environment Setup:** Used UE5's "Vehicle Template" for basic mechanics. Included terrain, trees, and shadows.
- **Asset Development:**
  - **Cars:** Modeled in Blender with proper collision settings.
  - **Tracks & Props:** Imported from UE5 marketplace.
- **UI Design:** Built with UE5 Widgets.
  - **Main Menu:** Start, Options, Quit.
  - **In-Game HUD:** Timer, checkpoint alerts, win/lose messages.
- **Game Mechanics:**
  - Game mode blueprint to control game states.
  - Checkpoint logic, collision handling, and player respawn system.
- **Design Flowchart:** Detailed the logical structure of the game's mechanics.

**Execution Phase**

- **Core Gameplay:** Implemented controls for acceleration, braking, and steering using Blueprint.
- **Checkpoint System:** Used collision boxes to register checkpoint progress and respawn points.
- **Camera Effects:**
  - **Lag and Shake:** Enhanced visual feedback during gameplay.
  - Managed using Timeline nodes in Blueprints.
- **Respawn Mechanism:** Triggered on crash or off-track event, returning the player to last checkpoint.
- **Troubleshooting:**
  - Solved texture and lighting issues through asset reimport and level streaming adjustments.

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# 5. Key Features

- **Main Menu:** Animated with options like Start, Options, and Quit.
- **HUD:** Displays race information in real-time.
- **Game World:** Trees, road textures, dynamic lighting.
- **Vehicle Models:** Multiple car models available.
- **Game Over Screen:** Displays result and restart option.

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# 6. Future Improvements

- **Multiplayer Support:** Enable online and LAN-based racing.
- **New Tracks & Vehicles:** Enhance game variety.
- **Sound Design:** Add sound effects for environment and UI.
- **Leaderboards:** Introduce ranking systems for competitive play.

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# 7. Conclusion

### Learning Outcomes

- Gained hands-on experience with **Unreal Engine 5** and **Blueprints**.
- Learned to integrate design, development, and testing in a 3D game project.

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