Animated City Scene in OpenGL

This project is a C++ OpenGL-based 2D animated city environment. It simulates a lively scene featuring moving vehicles, trains, airplanes, dynamic weather (rain and lightning), day-night transitions, and environmental elements like rivers, buildings, trees, and clouds.

Features

- 🚗 Animated Cars & Buses (multi-directional traffic flow)
- 🚂 Trains (animated on rail tracks)
- ✈️ Planes (two plane animations flying in opposite directions)
- ☁️ Moving Clouds with adjustable speed
- 🌧️ Rain, Lightning & Night Sky with starfield
- 🌞 Day & Night Modes
- 🌳 Natural Elements (trees, river, buildings, road dividers)
- 🐟 Fish & Boat Motion in River

Controls

Keyboard Controls (Based on User)

- N/n: Enable Night Mode
- D/d: Enable Day Mode
- R/r: Start Rain
- S/s: Stop Rain / Toggle Boat (Alif) / Pause Speed (Nihan)
- + / -: Increase / Decrease Rain Speed
- 0: Reset Rain Speed (Alif)
- 1: Max Speed for All Elements
- 2: Min Speed for All Elements
- 3: Normal Speed Reset
- J: Switch to Jam Scene
- A: Switch to Alif Scene
- B: Switch to Nihan Scene
- M: Switch to Mohsin Scene
- W/w: Trigger Wheel Rotation (Nihan only)
- ESC: Exit Application

Mouse Controls (Based on User)

- Left Click: Increase Speed
- Right Click: Decrease Speed
- Middle Click: Reset to Normal Speed
- Nihan Only:
- Left Click – Increase object/plane/cloud speed
- Right Click – Decrease object/plane/cloud speed

Tech Stack

- Language: C++
- Graphics API: OpenGL (with GLUT)
- Platform: Windows (windows.h dependency)

Run Instructions

- Requirements:
  - C++ Compiler (MinGW / MSVC)
  - GLUT, OpenGL, GLU libraries
  - Windows environment
- Compile & Run:

```
g++ main.cpp -o AnimatedCity -lglut32 -lglu32 -lopengl32 -lwinmm -lgdi32
```

File Structure

main.cpp — all logic, rendering functions, animations, input handlers

Functions for: drawBuilding, drawTrain, drawPlane, drawCar, drawRiver, drawCloud, drawTree, etc.

updateClouds(), updatePlane(), updateTrain(), etc for animation loops

Screenshots

Mohsin Ibna Hossain

Fig: City Day View

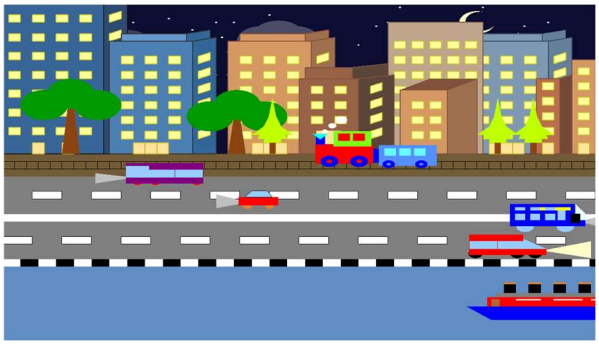

Fig: City Night View

Fig: City Rainy Day View

Fig: City Rainy Night View

Alif Hasan Khan

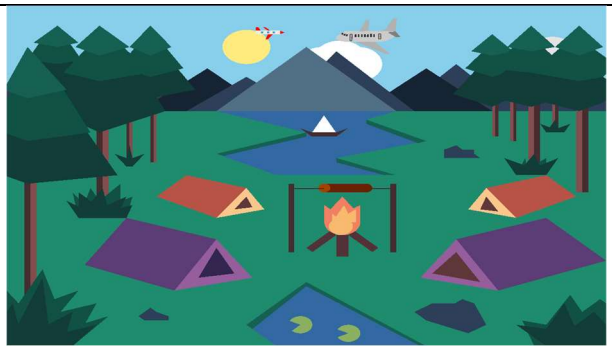

Fig: Forest Day View

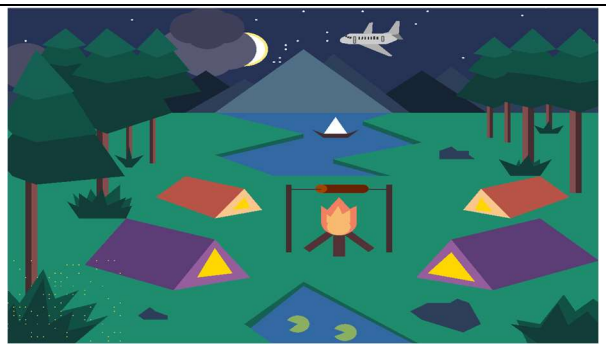

Fig: Forest Night View

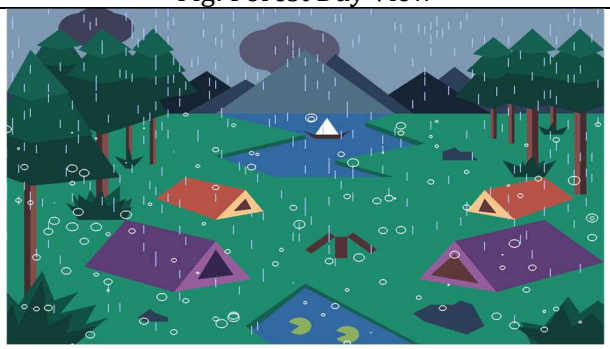

Fig: Forest Rainy Day View

Fig: Forest Rainy Night View

Md. Yeahyea Jam

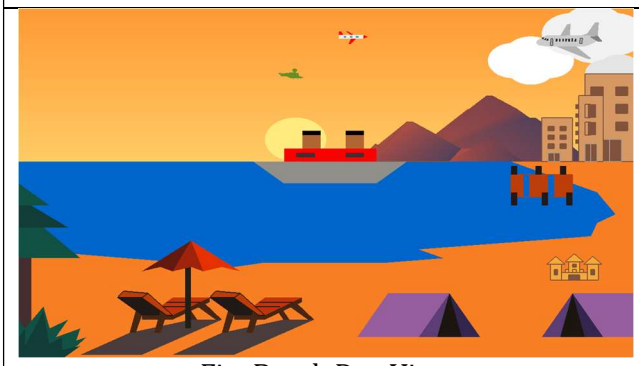

Fig: Beach Day View

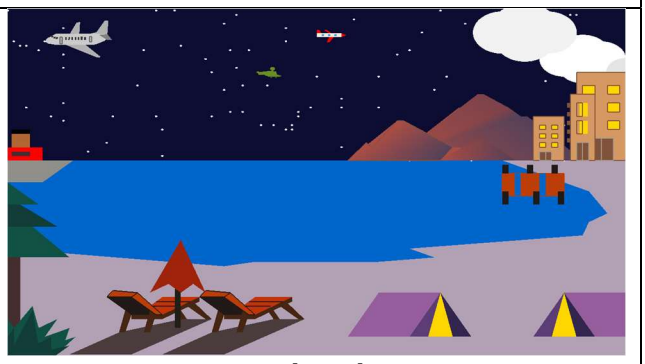

Fig: Beach Night View

Fig: Beach Rainy Day View

Fig: Beach Rainy Night View

Shadman Shakib

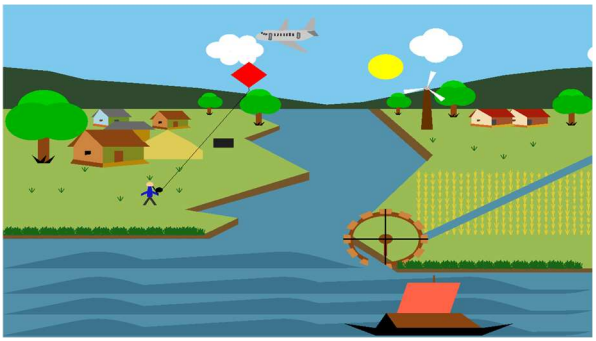

Fig: Village Day View

Fig: Village Night View

Fig: Village Rainy Day View

Fig: Village Rainy Night View

To-Do (for future improvements)

- Pause/Resume feature
- Add menu via glutCreateMenu()
- Use mouse drag to move view or zoom
- Rain sound or lightning flash intensity
- Add more buildings and traffic levels

Developers

- Mohsin Ibna Hossain
- Md. Yeahyea Jam
- Alif Hasan Khan
- Shadman Shakib

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