"A Journey Through Bangladesh: Train Landscapes"

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2. Introduction:

Bangladesh is a small country, but it is full of natural beauty, culture, and variety. Even though it does not have a very big land area, the different types of landscapes and rich traditions make it stand out in South Asia. The country has long rivers that flow like lifelines, endless green fields, rolling hills, and a beautiful coastline along the Bay of Bengal. Among many amazing places, two of the most special ones are Cox's Bazar and Sylhet. These two areas show very different sides of Bangladesh's beauty, highlighting the country's charm and diversity.

Cox's Bazar is famous all over the world for having the longest natural sea beach, stretching about 120 kilometers without any breaks. This unique feature attracts millions of tourists every year, from locals to international travelers looking for the perfect mix of sand, sea, and sunset. Next to the sea, there is a scenic road called the marine drive, which connects different beaches and gives a stunning view of the Bay of Bengal on one side and hills on the other. The soft sound of waves hitting the shore, along with the smell of salty sea air, makes the experience unforgettable.

On the other hand, Sylhet is known for its green hills, tea gardens, waterfalls, and peaceful surroundings. The area feels both natural and cultural, as it is also home to the traditional tea industry and unique tribal communities. The tea gardens of Sylhet, with neatly lined bushes, give a calm feeling, while the misty hills create almost magical scenery, especially in the early morning. Every year, people from Bangladesh and other countries visit these two places to enjoy their beauty, making them sources of national pride and international recognition.

One of the best and most enjoyable ways to explore Bangladesh's beauty is by train. Traveling by train here is not just about moving from one place to another; it is an

experience full of scenic views, culture, and a sense of timelessness. From the train window, travelers can see winding rivers, wooden or steel bridges, green rice fields, rows of trees, small houses with tin roofs, vehicles on the roads, and people going about their daily lives. Every view tells a story about rural and urban Bangladesh, showing the balance between nature and human life. The sound of the train whistle, the rhythmic movement of the wheels, and the excitement of passengers make train journeys unforgettable. For many, these trips become lifetime memories, a way to connect with the soul of the country. Our project, "A Journey Through Bangladesh: Train Landscapes," brings that experience into the digital world using computer graphics and animation, letting users travel virtually through these beautiful landscapes.

The main aim of this project is to create a simple but interactive animation that shows the landscapes of two famous places: Cox's Bazar and Sylhet. We used basic 2D computer graphics to make the main parts of the scenes. Using simple shapes like circles, rectangles, and triangles, we created objects such as trains, bridges, cars, buses, trucks, boats, trees, clouds, birds, waves, and hills. To make the scenes more alive, we added animation. Instead of keeping everything still, objects move naturally: the train glides on the land, boats float gently on the water, birds flap their wings, clouds drift slowly, and raindrops fall to show weather effects. All these movements make viewers feel like they are part of a real journey, as if sitting by the train window.

The project has two main scenes, each focusing on a different place.

Scene 1: Cox's Bazar Marine Drive – In this scene, the endless sea stretches in front, and animated waves move to show the water. Traditional fishing boats and modern speedboats float on the water, giving a cultural and lively feel. A long bridge crosses a river, showing the link between land and water. On the road, cars, buses, and trucks move in both directions, making it feel busy and real. The train passes smoothly across the land, while rows of trees and birds add more natural beauty. The sun and clouds show the time of day, changing from bright daylight to a softer evening sky. Rain can appear too, showing Bangladesh's monsoon weather, with wet roads, shiny water, and the smell of fresh rain, making the scene more real.

Scene 2: Sylhet City – In this scene, the green hills stand tall in the background, showing Sylhet's famous tea gardens and natural beauty. A wide bridge crosses the river, showing modern infrastructure. Near the bridge, a silver clock tower rises as a city landmark, giving the scene uniqueness. Like in Cox's Bazar, the train moves smoothly. Cars, buses, and a cargo truck move along the road, showing daily life and work. Birds fly across the sky, clouds drift naturally, and the clock on the tower ticks forward, showing time

passing. Gentle movement of trees and sunlight reflecting on water make this scene calm and beautiful.

Together, these two scenes show very different sides of Bangladesh—the beach charm of Cox's Bazar and the green hills of Sylhet. Combined, they give a wider and richer view of the country, making the journey feel varied and memorable. Another special feature is interactivity. Users do not just watch a static animation; they can control parts of the scene. For example, the train speed can be adjusted with the mouse, giving the feeling of being a train driver. Rain can be started or stopped using keyboard keys, letting viewers choose the weather. This makes the project more fun and engaging because the user participates actively.

From a technical side, the project uses simple 2D graphics. Every complex object, whether train, boat, or tree, was made by combining basic shapes. Animation was done by moving objects little by little, creating smooth motion. This simple method lets us create detailed digital scenes without advanced 3D tools. Another technical highlight is automatic scene change. After a few seconds, the animation switches between Cox's Bazar and Sylhet, just like a train moving through different landscapes.

Additionally, this project shows how computer graphics can be used for both fun and learning. Viewers not only enjoy the animation but also learn about Bangladesh's geography, famous places, culture, and beauty. In the future, the project can be expanded with more places, 3D graphics, or even virtual reality, letting users take a full virtual train ride across the country. With VR, people who cannot travel physically can still have a rich and great experience of Bangladesh's diversity, culture, and amazing landscapes.

3. Background of the Problem:

As Bangladesh is a small country, it is full of many beautiful places. Cox's Bazar has the longest beach and a scenic road, while Sylhet is known for green hills, tea gardens, and rivers. Both places attract visitors from home and abroad to enjoy nature and relax.

However, not everyone can visit these beautiful places in real life. Traveling to Cox's Bazar or Sylhet requires a lot of time, money, and effort, which is not possible for everyone. Some people live very far away from these places and cannot take long journeys due to work, school, or family responsibilities. Some people may not have enough money to cover travel costs, accommodation, and other expenses. Others

may have physical limitations or health problems that make it hard to travel long distances. Because of these reasons, many people cannot experience the beauty of these places in real life. They miss out on the chance to see the long beaches, green hills, rivers, and tea gardens in person. This creates a problem for people who want to enjoy and explore Bangladesh's natural beauty but cannot travel for different reasons.

Even if people try to experience these places digitally through pictures or videos, it is not the same as visiting them. Pictures are still images that show only one moment. They cannot show movement, changing weather, or different times of the day. Videos can show motion, like moving trains, crashing waves, or flying birds, but viewers cannot interact with the environment. For example, in a video, the waves always move at the same speed, the sun rises and sets in a fixed way, and nothing can be changed by the viewer. People cannot slow down the train, make it go faster, start or stop rain, or control any other element. This lack of interactivity makes pictures and videos less engaging, especially for people who want to feel like they are really there. Watching static or pre-recorded content can sometimes be boring because it does not provide the feeling of being part of the scene.

Another challenge comes for students and learners who are studying computer graphics and animation. Many students need good examples to understand how graphics programming works. They want to learn how objects are drawn, how movement is created, and how interaction is added. Without proper examples, learning computer graphics can be confusing and difficult. Most textbooks or online tutorials provide small pieces of code, but they do not show a complete project where all elements work together. Students may not understand how different parts of a program interact, how animation is synchronized, or how user input is handled. This lack of practical, full-scale examples slows down learning and makes students less confident in creating their own projects.

There are also technical challenges in representing real-life scenes digitally. Creating realistic animations is not easy. Some of the main challenges include:

- Natural appearance of objects: Trees, bridges, vehicles, clouds, and animals should be placed correctly and look realistic. If objects are drawn incorrectly, the scene looks fake and does not feel real.

- Smooth movement: Trains, clouds, birds, and boats need to move gradually. Sudden jumps or unnatural movements break the realism of the animation.

- Weather and time changes: Showing different times of the day, like morning, afternoon, evening, and night, or simulating rain and clouds realistically is difficult. These effects require careful programming to look smooth.

- User interaction: Allowing users to control elements of the scene requires careful coding and testing. For example, making the train move faster or slower with a click or starting rain with a key press must work perfectly.

- Scene transitions: Changing from one location to another should feel smooth and continuous. For example, moving from Cox's Bazar to Sylhet should look like a real journey, with skies, objects, and scenery updating gradually.

Because of these problems, many people cannot get a realistic and interactive digital experience of Bangladesh's famous places. Simple pictures and videos do not satisfy the curiosity of users who want to explore, interact, and feel the environment. Students who want to learn graphics programming often struggle to find clear, full-scale examples. There is also a lack of projects that promote the natural beauty and culture of Bangladesh digitally.

The project "A Journey Through Bangladesh: Train Landscapes" is designed to solve these problems in several ways:

1. Virtual Travel Experience: People who cannot travel to Cox's Bazar or Sylhet can explore them digitally. The project creates a simple 2D animation where users can see trains moving across bridges, rivers, hills, and seas. Vehicles, boats, birds, and clouds are animated to create a lively environment. This allows people to experience the beauty of Bangladesh from their computer.

2. Moving Scenes Instead of Still Images: Unlike static pictures, this project uses animation to show motion. Trains move across landscapes, clouds drift in the sky, birds fly, boats float on water, and rain falls. Moving elements make the scenes feel alive and realistic, giving users the sense of being part of the journey.

3. Interactivity: Users can interact with the environment. Clicking the mouse can make the train go faster or slower. Pressing keys can start or stop rain. These

interactions make the project more interesting and fun because users can change the scene according to their preference.

4. Educational Value for Students: Students studying graphics programming can see a complete project. They can learn how small 2D shapes are combined to form bigger objects, how objects are moved frame by frame, and how interaction is added using mouse and keyboard controls. This project provides a clear and practical example for learners.

5. Cultural Promotion: Bangladesh has very few digital projects showing its natural beauty. This project helps promote Bangladesh digitally, allowing people worldwide to see and enjoy the country's landscapes.

6. Smooth Scene Transition: The project changes scenes from Cox's Bazar to Sylhet and back smoothly. Skies, sun, clouds, and other objects update gradually, creating a continuous and realistic journey.

7. Simple Yet Realistic Design: Although the project uses 2D graphics, the combination of moving objects, interactive controls, weather changes, and smooth scene transitions creates a realistic feeling for the user.

In short, the project solves several important problems:

- Many people cannot travel to famous places in Bangladesh.
- Pictures and videos are static and cannot show interaction.
- Students lack full examples to learn graphics programming properly.
- Bangladesh's natural beauty is rarely shown interactively online.

By addressing these issues, the project becomes educational, entertaining, and meaningful. It allows users to explore famous places virtually, see realistic movements, interact with the environment, and learn computer graphics. It connects technology, culture, and education in a simple and effective way, making the beauty of Bangladesh accessible to everyone, no matter where they are or what limitations they may have.

4. Methods Used:

In this project, "A Journey Through Bangladesh: Train Landscapes," we created a 2D animated train journey through two famous places in Bangladesh: Cox's Bazar and Sylhet. The project uses C programming language with OpenGL and GLUT. These tools allowed us to draw objects, animate them, and make the project interactive.

The main goal was to make the train journey look simple, beautiful, and lively, while giving users some control over what happens in the scene. We wanted the project to be fun, easy to use, and educational.

1. Project Setup

First, we set up the OpenGL window using GLUT. We used glutInit() to start OpenGL and set the display mode to double-buffered with RGB colors. Double buffering ensures that animations look smooth and do not flicker. The window size was set to 1900x1000 pixels to give a wide view for the scenes.

Next, we used gluOrtho2D() to create a 2D coordinate system, which makes it easy to draw objects on the screen. The background color of the window was set to light blue, representing the sky.

We also enabled blending using glEnable(GL_BLEND) and glBlendFunc(GL_SRC_ALPHA, GL_ONE_MINUS_SRC_ALPHA). This made clouds, rain, and waves look soft and slightly transparent, adding more realism to the scenes.

2. Drawing Objects

Every object in the project is made using 2D shapes, like rectangles, circles, and triangles. We divided objects into small parts and wrote separate functions for each part. This made the code organized and easy to read.

For example:

• Train: The train is made of multiple parts.

 -bogi() draws the train body.

 -train_tier() draws the wheels.

-train_door() draws the doors.

-windowline() draws the windows.

• Vehicles on the road:

-car1wheels() draws car wheels.

-cargo_design() draws the cargo truck.

• Clouds:

-Cloud3() draws clouds floating in the sky.

• Bridge lights:

-bridge_blinkinglight() and bridge_blinkinglight2() make the bridge lights blink.

• Boats:

-updateboat2() moves the boats on the water.

Other objects like trees, birds, sun, waves, and the clock tower were drawn using simple shapes. By combining these shapes, we created complete objects.

3. Animation Techniques

Animation in the project is done by updating object positions step by step. Every time the screen is redrawn, objects move a little. This gives the illusion of smooth movement.

Some examples of animations:

• Train: The train moves from left to right using the variable train_pos. When it goes out of the screen, it reappears from the left. Users can make it go faster or slower by clicking the mouse.

• Clouds: Clouds slowly drift across the sky with updateCloud().

• Birds: Birds fly with small up-and-down motion using updateBird().

• Boats and waves: Boats float on the water while waves move with updatewave().

• Vehicles: Cars, buses, and trucks move along the road using updatecar(), updatemicro(), updateCar777(), and updateCar88().

• Rain: Rain is created using two arrays, dropX[] and dropY[], storing positions of up to 1000 raindrops. Each drop moves down, and when it reaches the bottom, it returns to the top, creating a continuous rain effect. The rain can start or stop using keyboard keys.

• Clock tower: The hour, minute, and second hands of the clock tower rotate with updateClockTick() to show real time.

• Bridge lights: Blinking lights on the bridge are animated to turn on and off using updateBridgeLight().

Timers (glutTimerFunc()) are used to update all movements regularly. Each timer calls a function to update an object's position after a set time interval. This keeps the animation smooth.

4. Interactivity

One of the main goals of this project was to make it interactive, not just a video. Users can control the scene in the following ways:

• Mouse Controls:

-Left click: Makes the train move faster.

-Right click: Makes the train move slower.

• Keyboard Controls:

-Press 'R' or 'r': Starts rain.

 -Press 'A' or 'a': Stops rain.

These controls make the project more engaging, giving users the feeling that they are part of the journey.

5. Scene Management

The project has two main scenes:

1. Scene 1: Cox's Bazar Marine Drive – Shows the sea, waves, boats, bridge, trees, birds, vehicles, and a moving train.

2. Scene 2: Sylhet City – Shows green hills, a bridge with a clock tower, vehicles, birds, and a moving train.

The scenes switch automatically every 10 seconds using the switchScene() timer function. During the transition, the sky, sun, clouds, and objects update gradually. This creates a smooth and realistic scene change, as if the train is traveling from one city to another.

We also included day and rain modes. In day mode, the sky is bright, the sun is visible, clouds drift slowly, and birds fly. In rain mode, clouds are gray, raindrops fall, and the sun may hide. Users can change modes with the keyboard, adding more variety and realism.

6. Programming Structure

The code is organized into modular functions. Each object or animation has its own function, which keeps the code clean, readable, and reusable. The main function sets up the OpenGL window, timers, display functions, and user input functions.

The display() and display2() functions redraw the screen every frame. They combine all objects and their updated positions to show the complete scene at each moment.

By using double buffering, the project avoids flickering and provides smooth animations. All movements and scene transitions are continuous, making the user experience realistic and enjoyable.

7. Testing and Optimization

We tested all features carefully to make sure everything works together:

• Train speed changes correctly with mouse clicks.

• Rain starts and stops properly with keyboard input.

• Clouds, birds, boats, and vehicles move smoothly.

• Clock tower hands rotate correctly.

• Bridge lights blink at intervals.

• Scenes switch automatically without abrupt changes.

We also adjusted timers, object speeds, and positions to make the movement natural. For example, clouds move slower than trains, and birds fly up and down lightly, giving a realistic effect.

These methods make the project easy to understand, interactive, and visually appealing. Users can enjoy a train journey through Bangladesh, control rain and train speed, and experience moving objects in 2D animation.

5. Feature Set:

The project, "A Journey Through Bangladesh: Train Landscapes," is a 2D animated train journey through two famous places in Bangladesh: Cox's Bazar and Sylhet. It has many features that make the journey interesting, interactive, and fun. The project is designed so that users can watch, enjoy, and interact with the scenes, making it feel like a real train trip.

1. Moving Train: The train is the main part of the project. It moves smoothly across the screen, showing several coaches, doors, and windows. The train travels from the left side of the screen to the right and then reappears from the left to continue the journey, giving a feeling of continuous movement. Users can control the train speed using the mouse. Left-clicking the mouse makes the train go faster, and right-clicking makes it slower. This gives users a sense of being in control, just like driving a real train. The train appears in both scenes, showing different landscapes of Bangladesh and maintaining continuity, so users feel like they are really traveling across the country.

2. Cars on the Road: In both scenes, small vehicles such as cars move along the road. Each car has its own speed, which makes the traffic look natural and realistic. Users can see cars passing by, sometimes slowly, sometimes faster, creating a lively and busy road. Watching these cars alongside the moving train gives a sense of everyday life in Bangladesh, showing how people travel and work in towns and cities.

3. Buses on the Road: Buses are another important part of the road scenes. They move along with the cars, but at a slightly slower pace to show that buses take more time on the road. Including buses makes the traffic feel more authentic and realistic. People using buses on the roads also show the public transportation system in Bangladesh. Watching the train move past buses creates a sense of dynamic motion and life in the scenes.

4. Cargo Trucks on the Road: Cargo trucks are added to the road to make the environment feel even more natural. Trucks carry goods and move slowly, showing the commercial activity happening in Bangladesh. When users watch the trucks move alongside cars, buses, and the train, they get a sense of a real busy road where different vehicles coexist. This adds richness to the animation, making it more detailed and closer to real life.

5. Boats on the Water: In the Cox's Bazar scene, the sea is visible in front of the viewers. Small traditional fishing boats and modern speedboats float gently on the water. Each boat moves in a slightly different direction and speed, giving a realistic impression of water travel. Watching boats move alongside the waves gives the feeling of being by the sea. It makes the digital scene feel lively, calm, and peaceful. The movement of the boats also shows human activity on water, just like in real coastal areas.

6. Water and Waves: The water in Cox's Bazar is not just static; gentle waves move continuously across the sea. These waves are animated to rise and fall slightly, creating a realistic motion. Watching the waves along with moving boats gives users a sense of being at the seaside, where the sea is never still. This movement adds depth to the scene, making it more immersive and natural. Users feel as if they can hear the waves hitting the shore while the train passes by.

7. Clouds in the Sky: Clouds are added to the sky to make it look alive. They drift slowly across the scene, showing the passage of time. Sometimes the clouds are white and fluffy, giving a clear and sunny day impression. Other times, the clouds appear gray, hinting at rainy weather. Moving clouds make the environment feel dynamic and realistic, instead of just a still background. Watching the clouds move while the train passes make users feel like they are part of the journey, observing the sky change naturally.

8. Sun in the Sky: The sun is included in the sky to make the daytime scene bright and cheerful. It adds light and color to the environment, giving warmth to the landscape. The sun appears in both Cox's Bazar and Sylhet scenes, creating a pleasant daytime atmosphere. Its presence, along with clouds and birds, makes the digital world feel more alive and natural, helping users enjoy a realistic and peaceful view during their virtual journey.

9. Birds in the Sky: Birds fly across the sky in both Cox's Bazar and Sylhet scenes. They move with small up-and-down motions, showing natural flight patterns. Birds add life and biodiversity to the scenes. Watching them fly alongside clouds and the sun gives users a pleasant feeling of being in nature. Birds also help maintain continuity between the scenes, as their movement creates a natural connection between different parts of the journey.

10. Rain Feature: The project includes rain to make the animation more interactive and dynamic. Users can start and stop rain using keyboard keys. When rain is active, up to 1,000 raindrops fall across the screen, creating a realistic rainy scene. The rain interacts with the environment, like showing wet surfaces on the ground or slightly darker clouds. Experiencing both sunny and rainy weather helps users feel more involved in the digital journey. Rain also adds variety and excitement to the trip, making it feel less repetitive.

11. Bridge with Blinking Lights: Bridges appear in both Cox's Bazar and Sylhet scenes. Each bridge has blinking lights that turn on and off at intervals. The lights make the bridges look lively, especially when vehicles and the train pass over them. This small detail adds realism and visual interest, making the journey more engaging. Watching a train cross a bridge with blinking lights creates a dynamic and colorful effect, capturing the user's attention.

12. Clock Tower: In Sylhet the red clock tower in Sylhet is a special feature. Its hands move in real time, showing hours, minutes, and seconds. This adds realism to the scene, making the city feel alive. Users can see the passing time, which helps connect the animation with real-world time. The clock tower also serves as a landmark, making Sylhet easily recognizable in the virtual journey.

 13. Scene Transition There are two main scenes in the project:

 Scene 1 – Cox's Bazar: Shows the sea, boats, bridge, trees, birds, sun, clouds, vehicles, and the moving train.

Scene 2 – Sylhet: Shows green hills, bridge with clock tower, train, birds, clouds, and vehicles. The scenes change automatically every 10 seconds. During the transition, the sky, sunlight, clouds, and objects gradually update to create a smooth shift. This makes users feel like they are traveling from one city to another by train.

Smooth scene transitions help maintain immersion, making the journey feel realistic and continuous.

 14. **Rain Modes**: The project allows users to switch between two weather modes: Day mode: The sky is bright, the sun shines, clouds drift slowly, and birds fly. Rain mode: Clouds turn gray, raindrops fall continuously, and the sun may hide behind clouds. This feature adds variety and makes the journey more interactive. Users can choose the type of weather they want, which makes the experience more personal and engaging.

 15. **User Interactivity:** Interactivity is a key part of the project. Users can control the train speed using the mouse and start or stop rain using the keyboard. These simple interactions make the journey more fun and realistic. Users do not just watch the animation also they take part in it. The controls are simple and easy to remember:

1.Mouse Interaction:

 - Left Click: Make the train go faster

 - Right Click: Make the train go slower

2.Keyboard Interaction:

 - 'A' or 'a': Stop the rain

 - 'R' or 'r': Start the rain

These interactive features help users feel involved and connected to the digital journey. They can virtually travel through Bangladesh, see beautiful landscapes, experience different weather, and enjoy city life, all from their computer.

6. Future Directions:

This project, "A Journey Through Bangladesh: Train Landscapes," can be made better in many ways in the future. Right now, it shows a 2D train trip through Cox's Bazar and Sylhet. The train moves, cars, buses, trucks, birds, clouds, boats, rain, waves, and a clock tower are all animated. Users can control train speed and start or stop rain. But we can make it more fun, realistic, and interesting.

1. More Places:

We can add more cities and places in Bangladesh, like Dhaka, Sundarbans, Chittagong hills, Rangamati, or Srimangal tea gardens. Each new place can have different objects, like rivers, bridges, hills, trees, or buildings. This will let users see more of Bangladesh in a virtual train journey. It will make the project longer and more exciting.

2. Different Weather:

Now, we have day and rain modes. In the future, we can add sunset, sunrise, night, fog, or storm. Night mode can show the moon, stars, and street lights. Storm mode can have heavy rain, lightning, and fast clouds. These changes will make the scenes more real and beautiful.

3. More Control for Users:

Right now, users can change train speed and rain. In the future, they can also:

• Pause or restart the animation

• Change the train's direction

• Move clouds or sun

• Look at the scene from different angles

This will make the project more interactive. Users will feel like they are really on the train.

4. Add Sounds:

Adding sounds will make it more fun. For example:

• Train moving and horn sounds

• Car and bus sounds

• Birds singing and waves

• Rain and wind

Sounds will make the scenes more alive and real.

5. Better Graphics:

Currently, all objects are simple 2D shapes. We can make them look better by adding:

• Textures and colors for trees, water, hills, and vehicles

• Shadows to show depth

• Smoother movements for trains, birds, and boats

This will make the scenes look more natural and beautiful.

6. More Vehicles and Trains:

We can add more trains and vehicles moving in different directions. Users can see:

• Two or more trains on different tracks

• Cars, buses, and trucks on many roads

7.Using the Project in Different Ways:
Once we make all these improvements, the project can go beyond just being a simple animation. For example:

- It can be adapted for cartoon movies or short animations, showing real Bangladesh landscapes in a fun way.
- It can become a game or interactive simulation, where players can control trains, vehicles, and weather.
- It can be presented at exhibitions or events, where people can try it out and give feedback. Their ideas and suggestions can inspire new features and improvements.

By exploring these future directions, the project can evolve into a bigger, more creative, and more interactive experience. It will not only entertain users but also showcase the beauty of Bangladesh in an innovative way.

7. Conclusion:

This project, "A Journey Through Bangladesh: Train Landscapes," shows a 2D animated train journey through two famous places in Bangladesh: Cox's Bazar and

Sylhet. The main goal was to make a fun, easy-to-use, and interactive animation that lets users enjoy the beauty of Bangladesh without traveling.

In this project, we used C language with OpenGL and GLUT. Every object in the scenes, like the train, cars, buses, trucks, clouds, birds, boats, waves, sun, trees, and clock tower, was made using simple 2D shapes like rectangles, circles, and triangles. By combining these shapes and moving them with timers, we created smooth animations.

The train moves left to right, and users can change its speed using the mouse. Cars, buses, and trucks move along the roads, birds fly, clouds drift, boats float, and waves move in the water. Rain can start or stop using the keyboard. The clock tower in Sylhet has moving hour, minute, and second hands. All objects move in a simple way, but together they make the scenes look alive.

The project has two scenes:

1. Cox's Bazar Marine Drive – Shows the sea with moving waves and boats, a bridge, cars, buses, trucks, a moving train, trees, birds, clouds, the sun, and rain.

2. Sylhet City – Shows green hills, a bridge, a red clock tower, moving trains and vehicles, birds, clouds, and the sun.

The scenes switch automatically every 10 seconds, giving users the feeling of a real train journey from one city to another. The project also has day and rain modes, making it look dynamic and realistic.

One of the best features is interactivity. Users can control the train speed and rain, which makes the project more interesting than just watching a video. It feels like users are part of the journey.

Even though this is a 2D project, it still shows the beauty and variety of Bangladesh. The seaside of Cox's Bazar and the hills of Sylhet are represented clearly. With moving objects, smooth transitions, and interactive controls, the animation is fun, easy to watch, and educational.
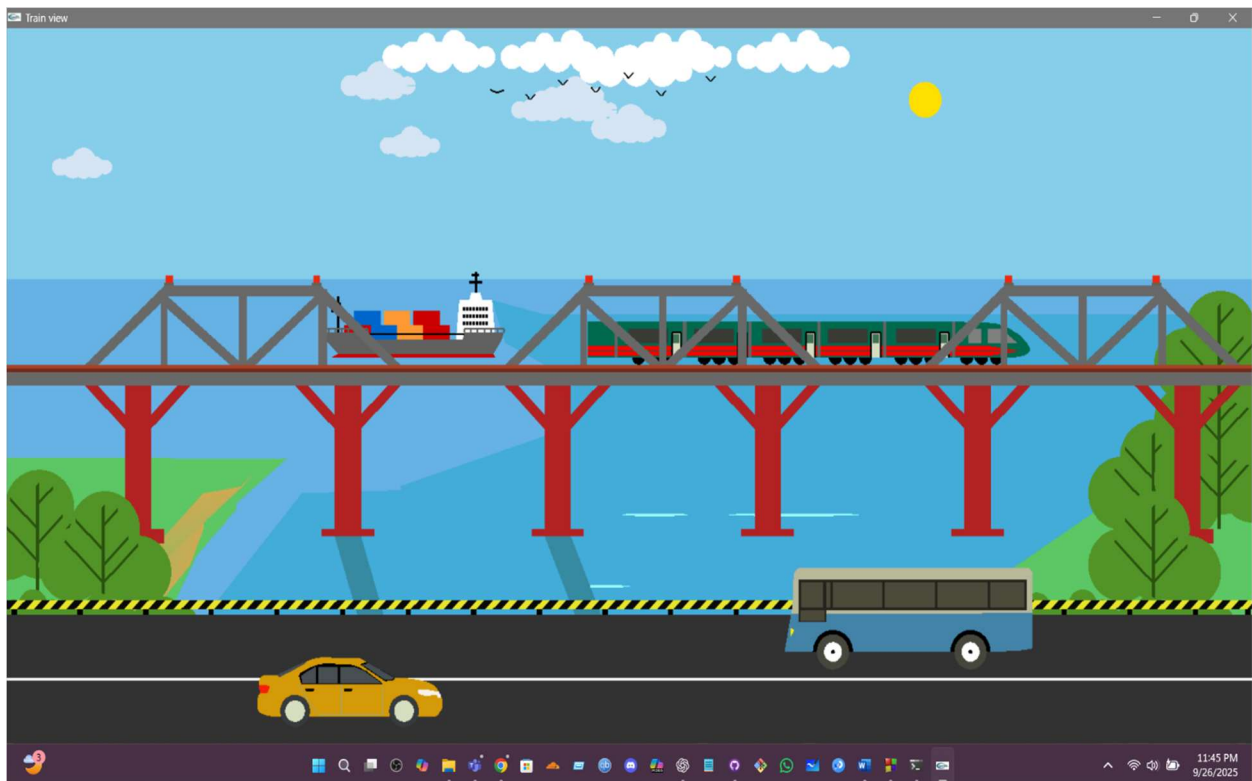
This project is not only about graphics but also about learning and creativity. Students can see how simple shapes can be combined into objects, how animations are made, and how user interactions work. It also connects technology with culture, showing Bangladesh's landscapes in a digital form.

In the future, the project can be improved with more places, weather effects, sounds, better graphics, more vehicles, cross-platform support, or even virtual reality. But even now, it successfully gives a virtual train journey experience, letting users see famous places, enjoy moving objects, and control the scenes themselves.
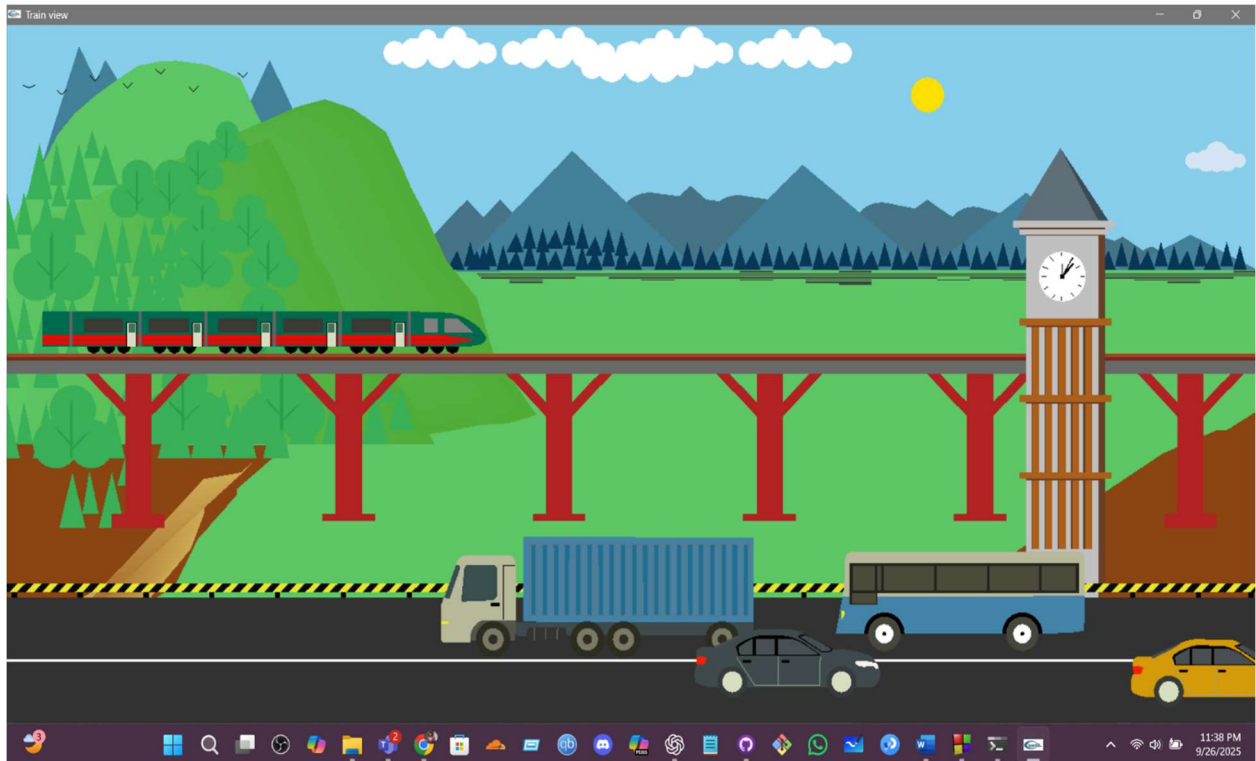
8. Implementation Code Link:

https://github.com/zarifmdfaiaz/A-Journey-Through-Bangladesh--Train-Landscapes/blob/main/implementation%20code.txt
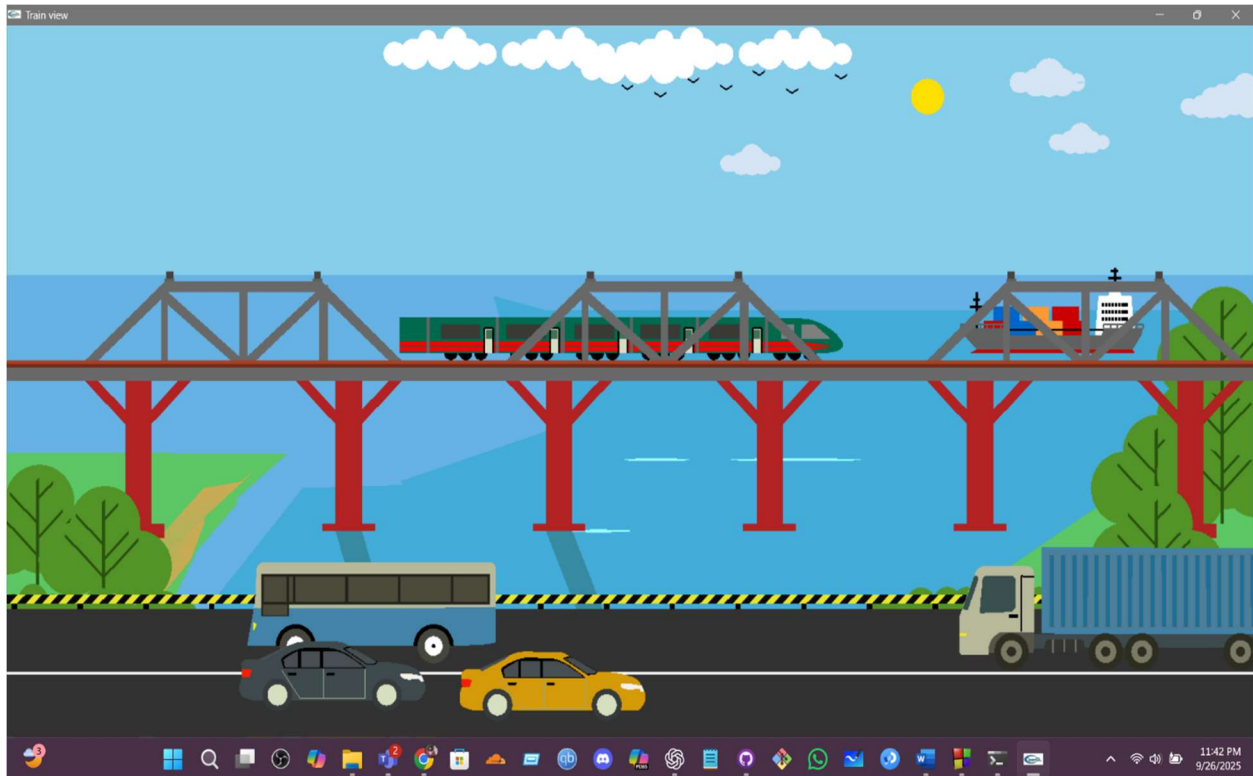
9. Screenshots of the project:

Screenshot of Scene 1

Screenshot of Scene 2

Screenshot of Scene 1with Rain On

Screenshot of Scene 1with Rain Off

10. Link of the Github repository :

https://github.com/zarifmdfaiaz/A-Journey-Through-Bangladesh--Train-Landscapes

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