AMERICAN INTERNATIONAL UNIVERSITY BANGLADESH (AIUB)

FACULTY OF SCIENCE & TECHNOLOGY

Course Title

COMPUTER GRAPHICS

Project Report

"The Journey of Education: From School to University"

Fall 2024-2025
Section: K

Submitted To

NOBORANJAN DEY

Submitted By:

Name	ID
Naznin Akter Roshmny	**22-46092-1**

Date of Submission: 05.02.2025

Title of the project

The Journey of Education: From School to University

Introduction

Project Overview

The project, The Journey of Education: School to University, is an interactive graphical animation that portrays the different stages of education, from primary school to university. By using OpenGL and GLUT, we created a smooth and dynamic animation that guides the viewer through each stage of the educational journey. Along with the visual transitions, we have included text elements and music to enhance the user experience. Each educational phase is represented by a scene, which is animated and accompanied by relevant information, such as school activities, key milestones, and motivational messages. Additionally, the background music is played asynchronously using sndPlaySound to further enhance the immersion.

Purpose of the Project

The purpose of this project is to create an interactive and visually appealing representation of a student's educational journey. It aims to evoke nostalgia, inform younger audiences about the different phases of education, and celebrate the transition from one academic level to another. Additionally, the project serves as a practical implementation of OpenGL for 2D animations, scene transitions, and audio-visual integration.

Significance of the Project

- **Educational Value:** Helps individuals understand the structured progression of education in a simple yet effective manner.
- **Graphical Simulation:** Demonstrates how OpenGL can be used for animation and visualization in educational content.
- **Programming Skill Development:** Enhances programming skills in C++ and OpenGL while implementing smooth transitions and animations.
- **Inspirational Impact:** Encourages students to look forward to their academic journey with enthusiasm and motivation.
- **Audio-Visual Integration:** Adds to the immersive experience by integrating background music and sound effects into the animation.

Target Audience

- **Students:** Provides an engaging way to visualize their educational path.
- **Teachers and Educators:** Useful for illustrating different academic levels.
- **Parents:** A simple representation of the educational process for children.
- **Programmers and Designers :** Demonstrates OpenGL animation, scene transitions, and audio integration.

Tools Used in the Project

Graphics and Transformation Functions

- **glTranslatef(x, y, z)**: Used to move objects smoothly across the screen, essential for creating movement between educational phases.
- **glRotatef(angle, x, y, z)**: Used to animate objects by rotating them during scene transitions, adding a dynamic feel to the animation.
- **glScalef(x, y, z)**: Allows resizing of text and objects during transitions to create a visually engaging effect.
- **glutBitmapCharacter()**: Renders textual content on the screen, which is used for displaying important information in each scene.
- **glColor3f(r, g, b)**: Defines the colors of elements, making the animation vibrant and visually appealing.
- **glutPostRedisplay()**: Ensures that the screen updates continuously, maintaining smooth animation and transitions.
- **glutTimerFunc(milliseconds, function, value)** : Facilitates time-based events, such as automatic scene transitions and timed animations.
- **Music and Sound Integration:**
- **Background Music:** Motivational and soft background music has been added to set the tone and pace of the educational journey. The music is played asynchronously using sndPlaySound("Anime.wav", SND_ASYNC), ensuring it doesn't block the animation or other functions.

Knowledge Applied in the Field

- **Animation Techniques :** Implementing smooth transitions using OpenGL functions such as glTranslatef, glRotatef, and glScalef, while also applying timing mechanisms for automatic scene changes.
- **Scene Management :** Organizing different phases of education into distinct scenes, ensuring clear transitions from one phase to another.
- **Event Handling:** Handling keypress events to allow manual switching between scenes, as well as timed transitions to automatically move through the stages.
- **Text Rendering :** Using GLUT's bitmap fonts to render essential information, such as educational milestones and motivational messages.
- **Audio-Visual Integration :** Combining both visual elements and sound to create a cohesive and immersive experience, using sound libraries for the music and effects.
- **User Interaction :** Allowing users to interact with the animation by controlling the progression through keyboard inputs, enabling greater engagement with the content

Scenes Shown in the Project

The animation consists of multiple scenes representing different educational phases. Each scene smoothly transitions into the next, providing an immersive experience.

1. **School Life**
2. **College Life**
3. **University Life**
4. **Classroom**
5. **Transition**

1. School Life (schoolLife)

- **Visual Elements:**
  - A school building with a playground.
  - Students wearing uniforms, chatting, or playing.

2. College Life (collegeLife).

- **Visual Elements:**
  - Students wearing uniforms, chatting, or playing.
  - Groups of friends discussing assignments.

3. University Life (universityLife)

- **Visual Elements:**
  - A modern college campus with students walking around.
  - A graduation ceremony with students in caps and gowns.

4. Classroom (classroom)

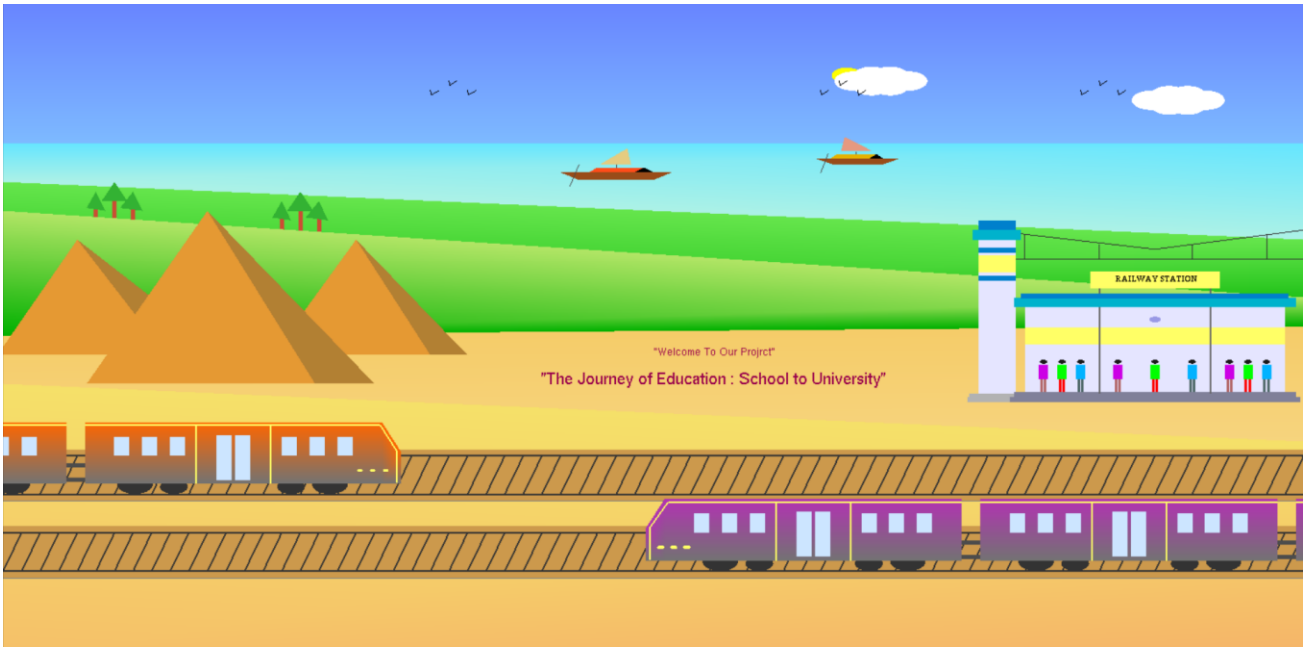
- **Visual Elements:**
  - A teacher writing on a blackboard or a projector screen displaying lessons.
  - Students taking notes, engaging in discussions, or giving presentations.
  - A teacher delivering a lecture in a large hall

5. Transition (transaction)

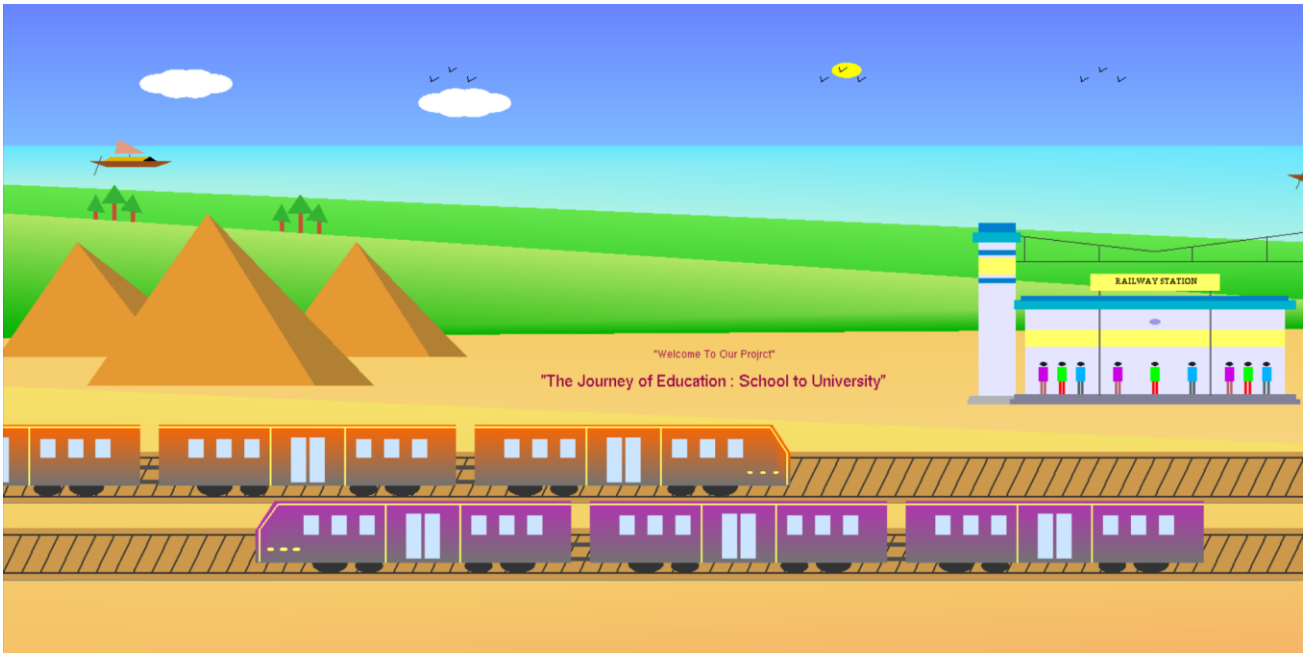
- **Visual Elements:**
  - Text animations like **"School to College"** or **"College to University"**.

Screenshot

Initial Scene *: Welcome to the journey of Education*

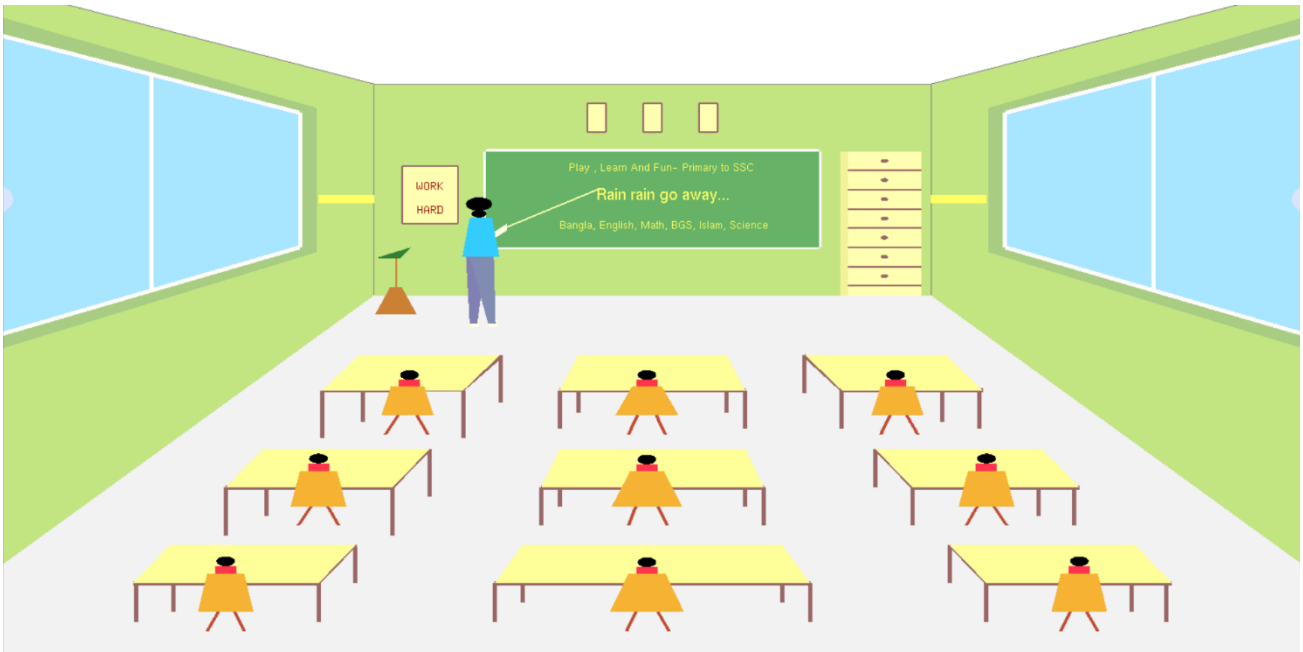


Initial Scene *: Beginning of the Journey.*



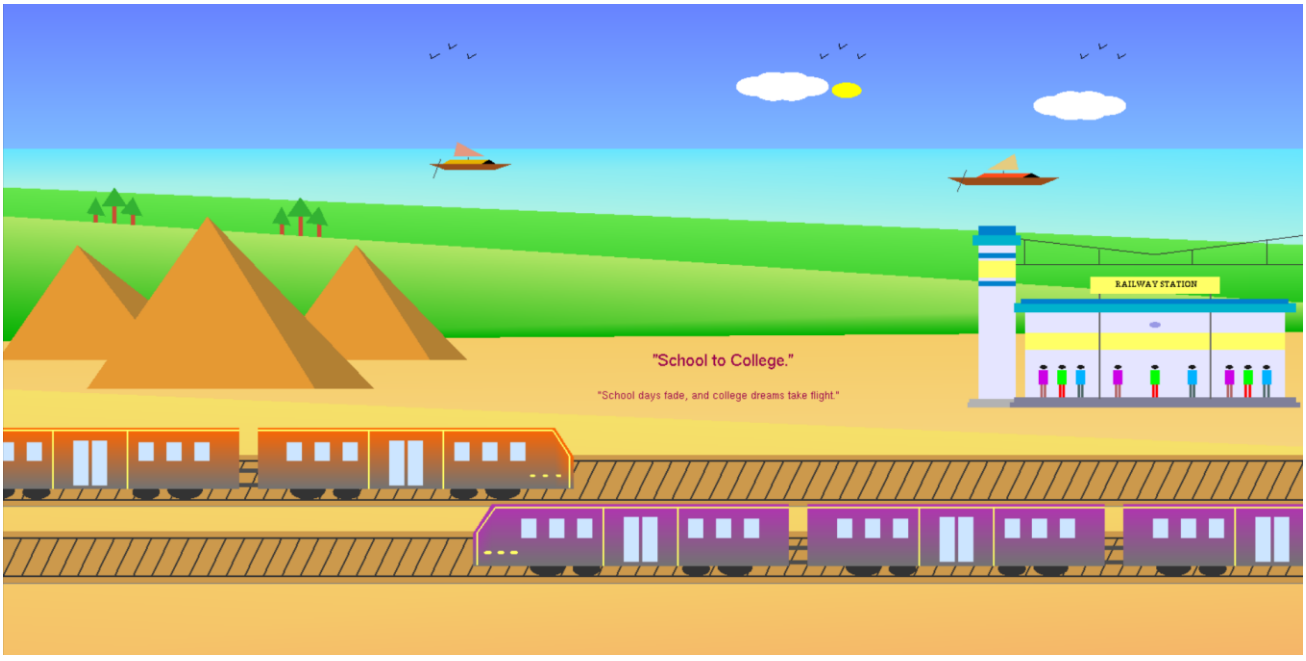
School Scene : ***Entering the Primary School***

School Classroom : ***Learning Begins***

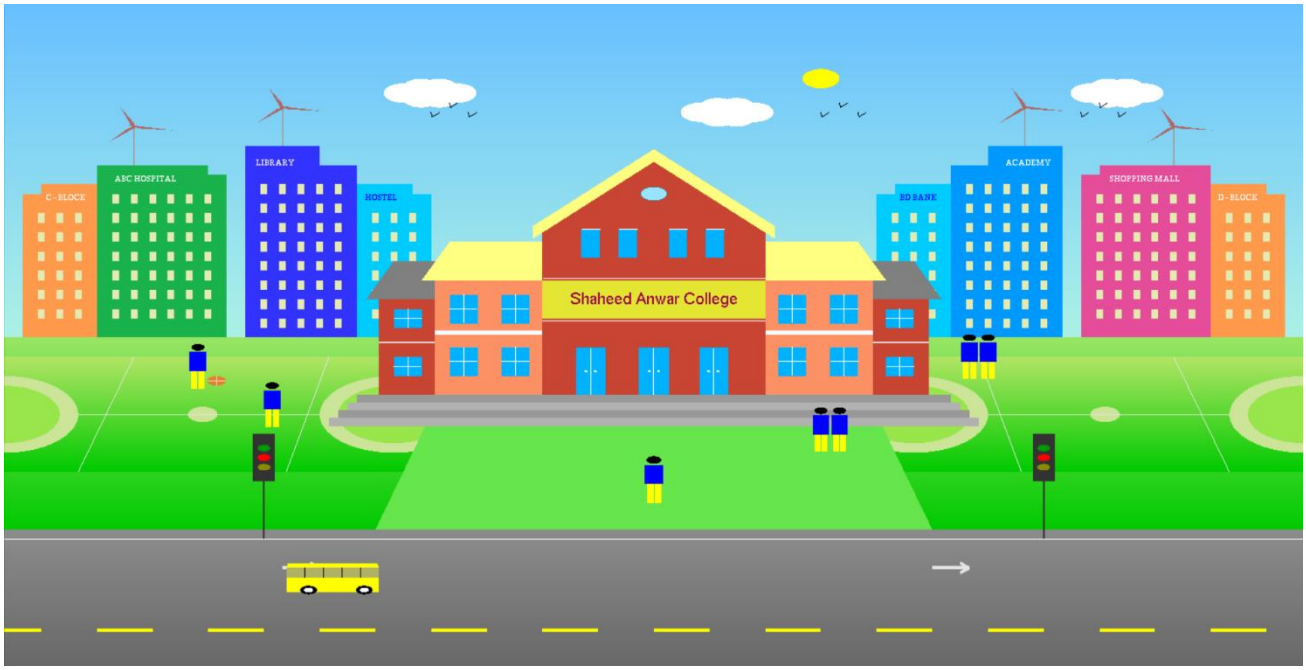


Back on the Journey : ***Traffic Light Red***

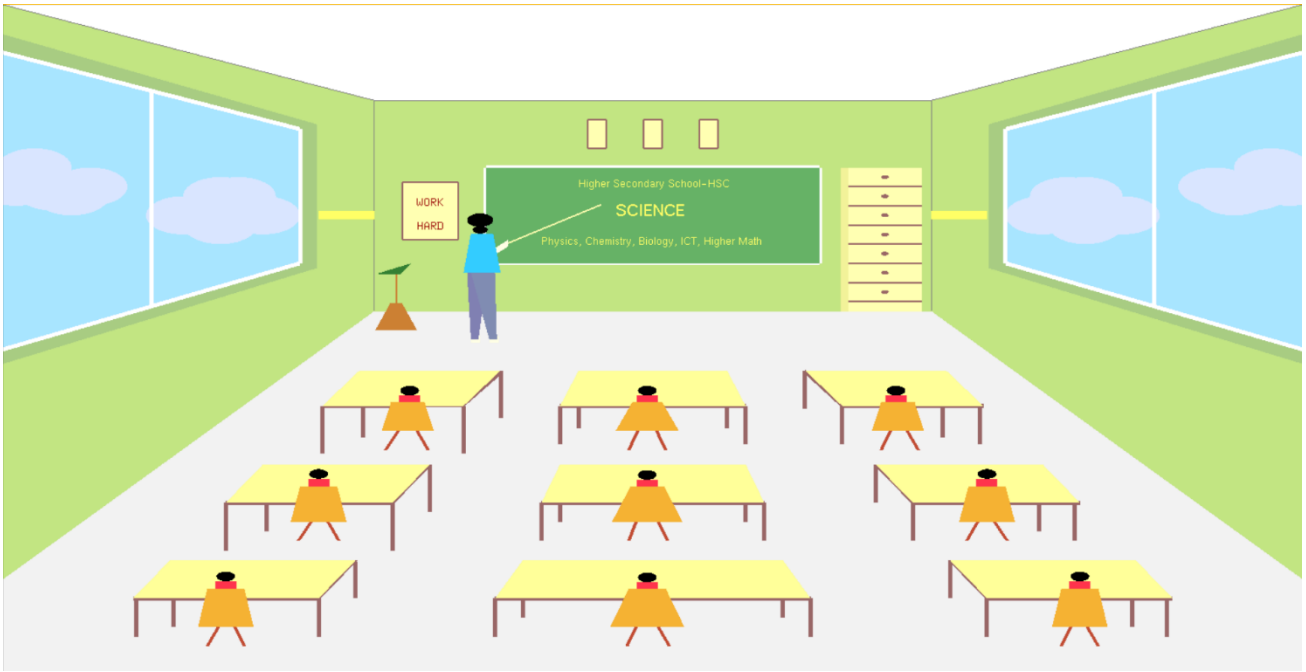
Transition : ***From School to College***



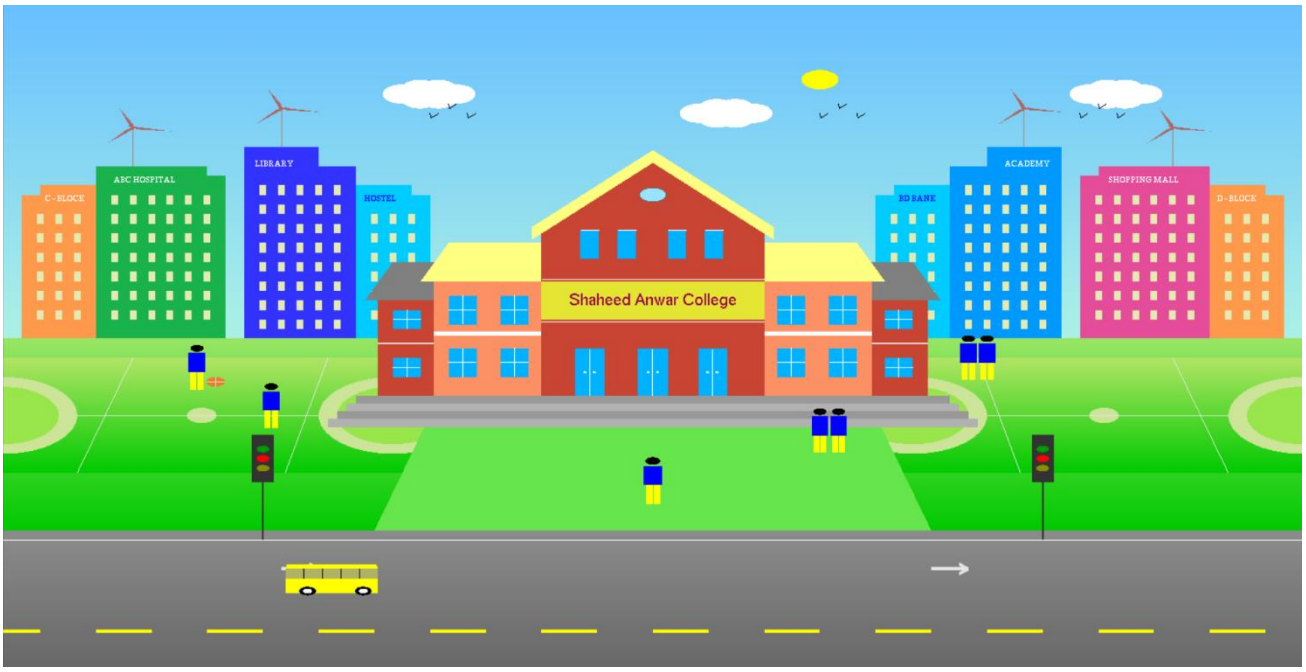
College Area : ***A New Phase***



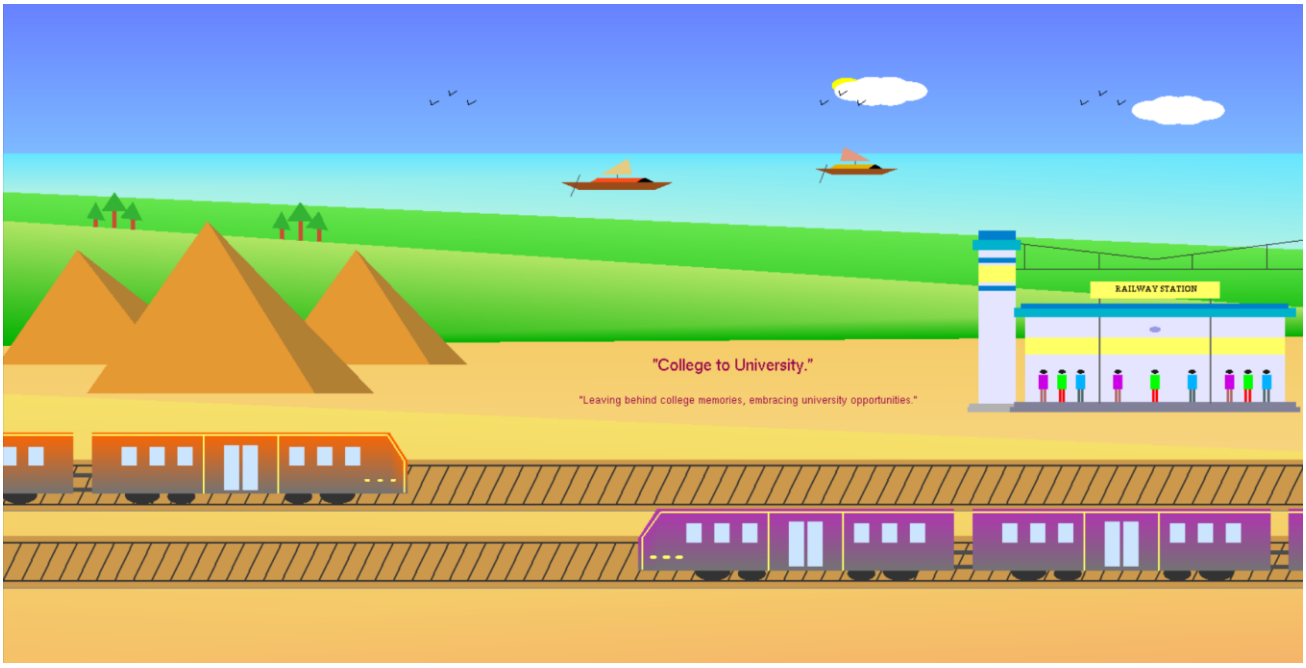
College Classroom : ***Advanced Learning(Physics, Chemistry, Biology)***



Back on the Journey : *Traffic Light Red*

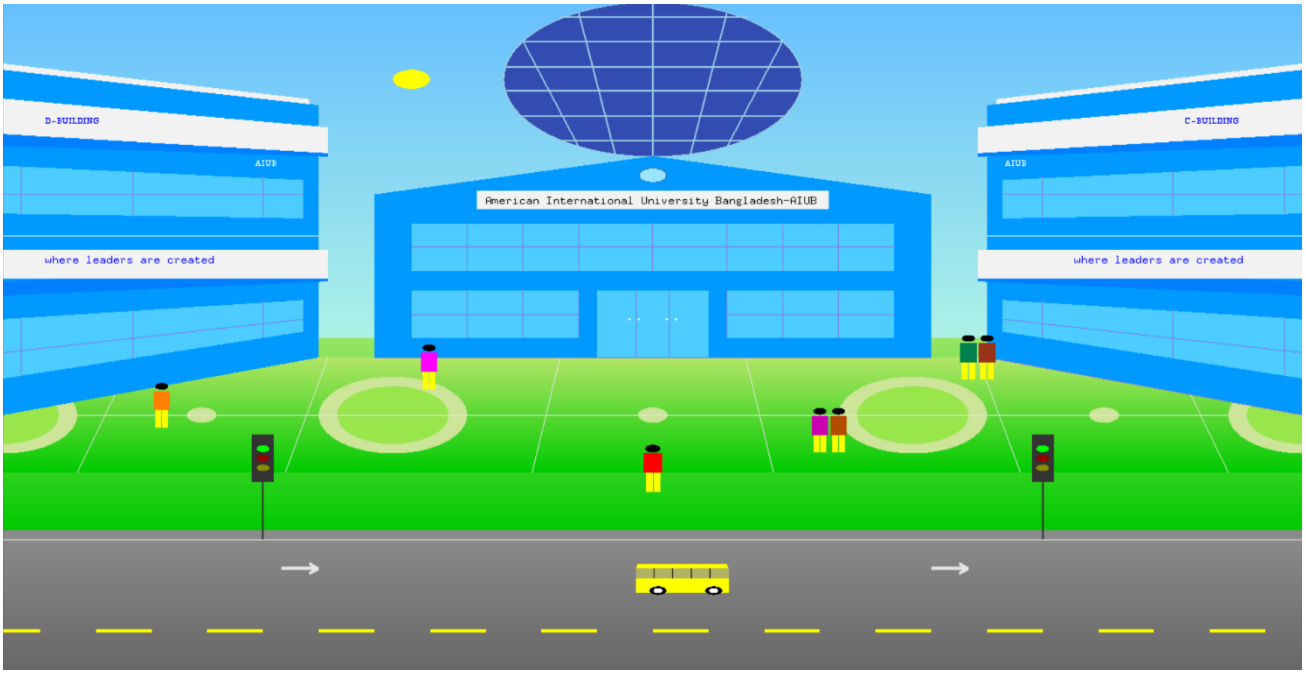


Transition : ***From College to University***

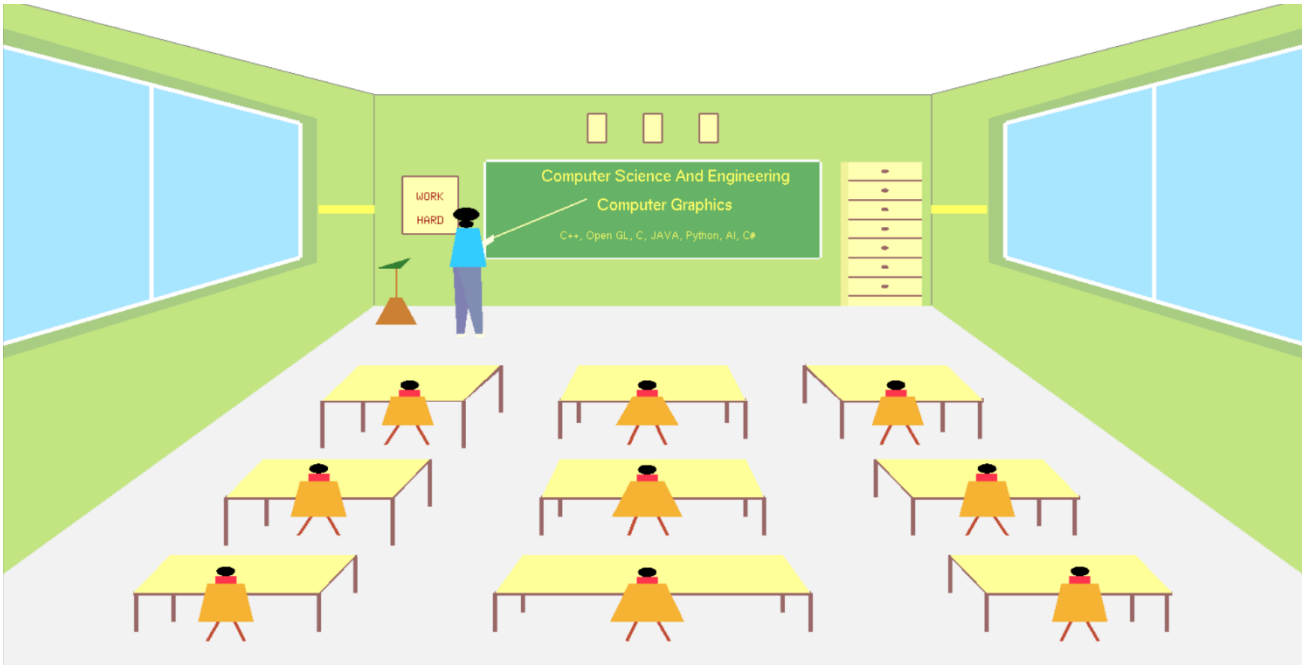


University Campus : *Higher Education Begins*

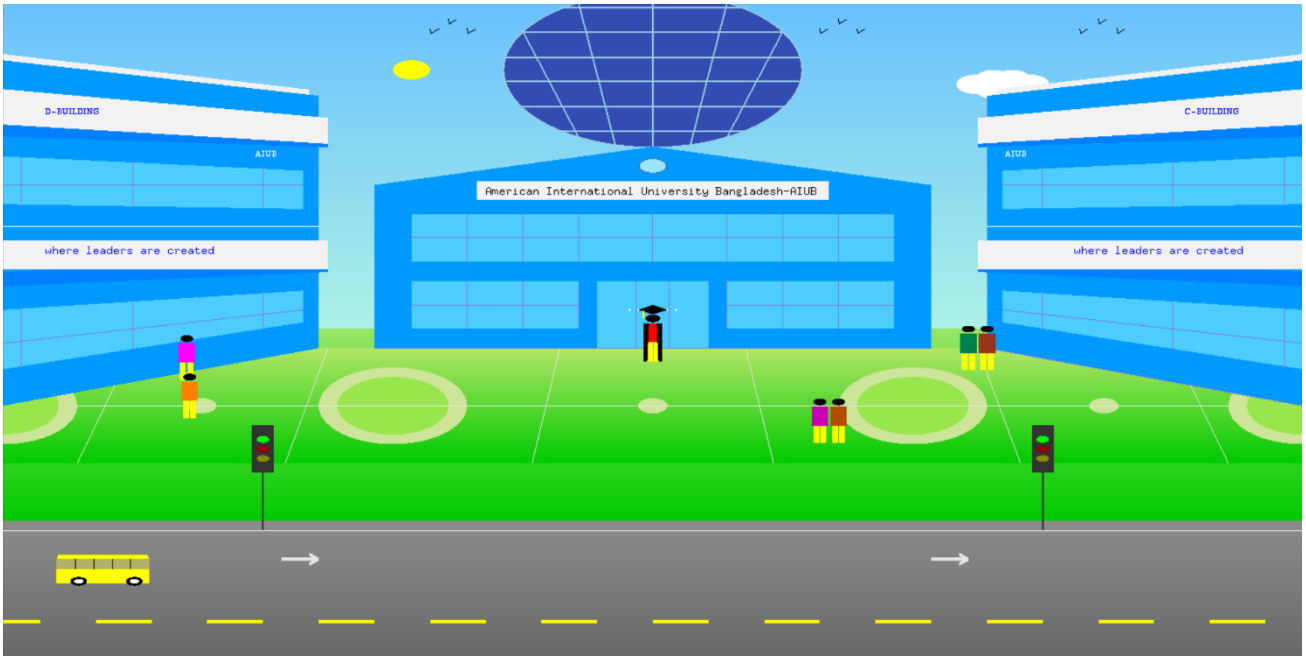
Inside a university classroom



Classroom : ***with students learning advanced topics from a professor.***

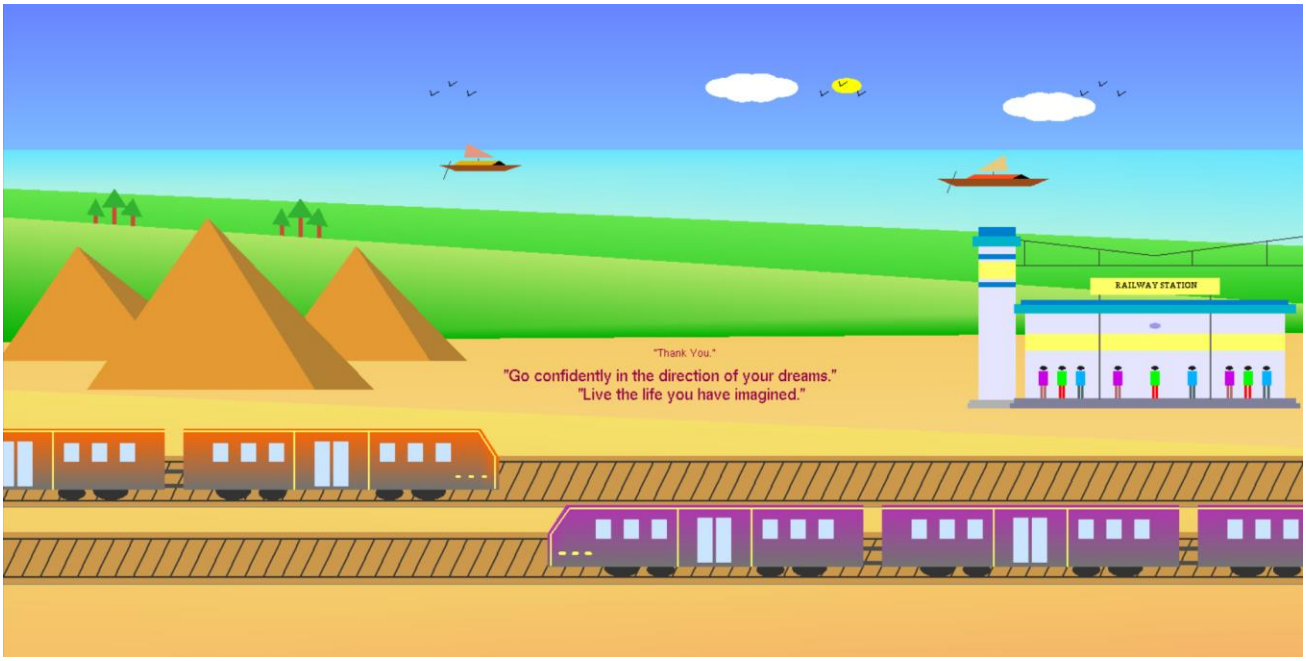


Back on the Journey : ***Wearing Graduation Dress***



Graduation Day : *Success Achieved!*

Thank You : *End of the Journey*



With the quotation :

"Go confidently in the direction of your dreams. Live the life you have imagined."

Challenges Faced

Ensuring smooth transitions between scenes was challenging, as it required careful timing and coordination between the animation functions in OpenGL.

Incorporating music and synchronizing it with the transitions posed some technical difficulties. However, by utilizing sndPlaySound for background music and sound effects, we were able to seamlessly integrate audio into the project.

Future Enhancements

- Advanced Graphics: Incorporating 3D elements or more complex animations for future versions of the project.
- More Customization: Allowing users to customize the visual appearance of the scenes, such as changing the characters or the environment, to reflect different cultural or personal educational experiences.

GitHub Repository

- **The Journey of Education : School to University -** **https://github.com/roshninaznin/The-Journey-Of-Education-From-School-To-University**

Youtube Link

- **The Journey of Education : School to University -** **https://www.youtube.com/playlist?list=PLLji3A7nrHi1THRtba2iksUOwsErVtnmp**

Reference Materials

- Online Tutorials and OpenGL Forums – Various resources for debugging and improving scene transitions.

Conclusion

In conclusion, the Journey of Education: School to University project effectively demonstrates the use of OpenGL and GLUT for creating an interactive, visually engaging animation that represents the stages of education. The addition of background music and sound effects adds an immersive layer, further enhancing the experience. The project serves as a valuable educational tool, illustrating the progression of a student's academic journey while also showcasing practical OpenGL animation techniques. With plans for future enhancements, this project has the potential to become a more comprehensive educational resource for students, educators, and programmers alike.