American International University-Bangladesh (AIUB)

Department of Computer Science and Engineering

Faculty of Science &Technology (FST)

SUMMER-2021

CSC 00084- Computer Graphics

Section: L

Project Title: City Scenario

Submitted by: Group #05

Name	ID
1. Fahim Ahmmed Mojumder	19-39488-1
2. Md Al Amin Hossen	19-39535-1
3. Ashraful Huda Rafi	19-39721-1
4. Md Monjurul Islam Arman	19-39482-1
5. Prisila Saha	19-39759-1

Submitted to:

MD. KISHOR MOROL

Lecturer,

Department of Computer Science

1. Introduction:

Computer has become a powerful tool for the rapid and economical production of pictures. Computer Graphics remains one the most exciting and rapidly growing fields. It is natural to expect that graphical communication will often be more convenient when computers are utilized for this purpose.

In our project, we implemented a city life where day and night view has been drawn. There are many features in day and night view, which can be done by pressing a keyboard button in the city view. Altogether it would render an eye-pleasing city view scenario. Our program provides a fast and accurate rendering of the objects as well as a landscape to simulate a city view.

2. Problem Statement/Literature Review/Background:

Mainly we tried to draw the view of a city. There are some buildings in the city. There is a river across the city. And some ships that go through the river. We have also drawn a highway in the city. We are using four transport here three are car and another one is a truck which is continuously going through the highway. There is a plane moving from one place to another. There are day and night views of the city. In the daytime, the sky is blue and filled with clouds and we will see the sun. At night the sky is dark and a full moon appears along with many stars and at night we will see the sky is cloudy.

3. Objective of the Project:

In city view, there will be a two-way highway road in a city area beside a river with multiple buildings, cars, trucks, ships, planes, clouds, lampposts, and other small components. It will have summer with day, night views. There will have multiple animations in this project. The program will run everything with some relevant sound effects regarding the view effect of the scene. In the future, we would like to develop this project into a 3D architecture that can turn this into more eye soothing to the user.

The main objectives of this project are:

1) To implement the features of graphics.

2) To interface the applications of graphics to the real world.

3) To give some benefits to the disability.

4) To make the life easier.

5) To become familiarization with Graphics and its logical coding.

4. Methodology/System Implementation method:

This project was done with the help of C++ Programming Language. Different methods are performed to make it more applied and efficient. Graphics programming is very easy and interesting. We used glut graphics programming for developing our projects, for designing, animation, etc. It's not like traditional C++ programming in which you have to apply complex logic in your program and then you end up with a lot of errors and warnings in your program. In glut graphics programming you have to use standard library functions (need not worry if you don't know functions) to get your task done. Just you pass arguments to the functions and it's done. Many graphic functions are coded on its header files which are <GL/gl.h> and <GL/glut.h>.

Some of the function included in <GL/gl.h> and <GL/glut.h>. used in our project:

- **glTranslatef()**

In our project, we have used the glTranslatef() function to move an object. For example, in drawing the cars, we have drawn them in (0,0) position and then translated them into proper position on the road.

- **glScalef()**

We have used the glScalef() function to increase or decrease the size of an object. For example, in drawing the plane, we have decreased the size of the plane from its initial size, to set it properly in the sky.

- **glRotatef()**

The glRotatef() function is used for rotating an object. In our project, we have used the glRotatef() to make the car tire rotate, while it's moving.

- **gluOrtho2D()**

gluOrtho2D() sets up a two-dimensional orthographic viewing region. In our project, we have used this function to set the region at gluOrtho2D(-960, 960, -500, 500).

- **glutInitWindowSize()**

It defines the size and position (upper left corner) of the window on the screen. We have used this function to make our initial window size 1200 by 625.

- **glutDisplayFunc()**

This function sets the display call back for the current window. When GLUT determines that the normal plane for the window needs to be redisplayed, the display call back for the window is called. In our project, we have created a function named 'display', which is called by glutDisplayFunc().

- **glutTimerFunc()**

glutTimerFunc registers a timer call back to be triggered in a specified number of milliseconds. In our system, we have used this function to update our objects calling the function after every 1000 milliseconds

- **glutswapbuffers()**

glutSwapBuffers swaps the buffers of the current window if double buffered. Performs a buffer swap on the layer in use for the current window. In our project, we have used this function to deal with double buffering.

5. Significant of the project:

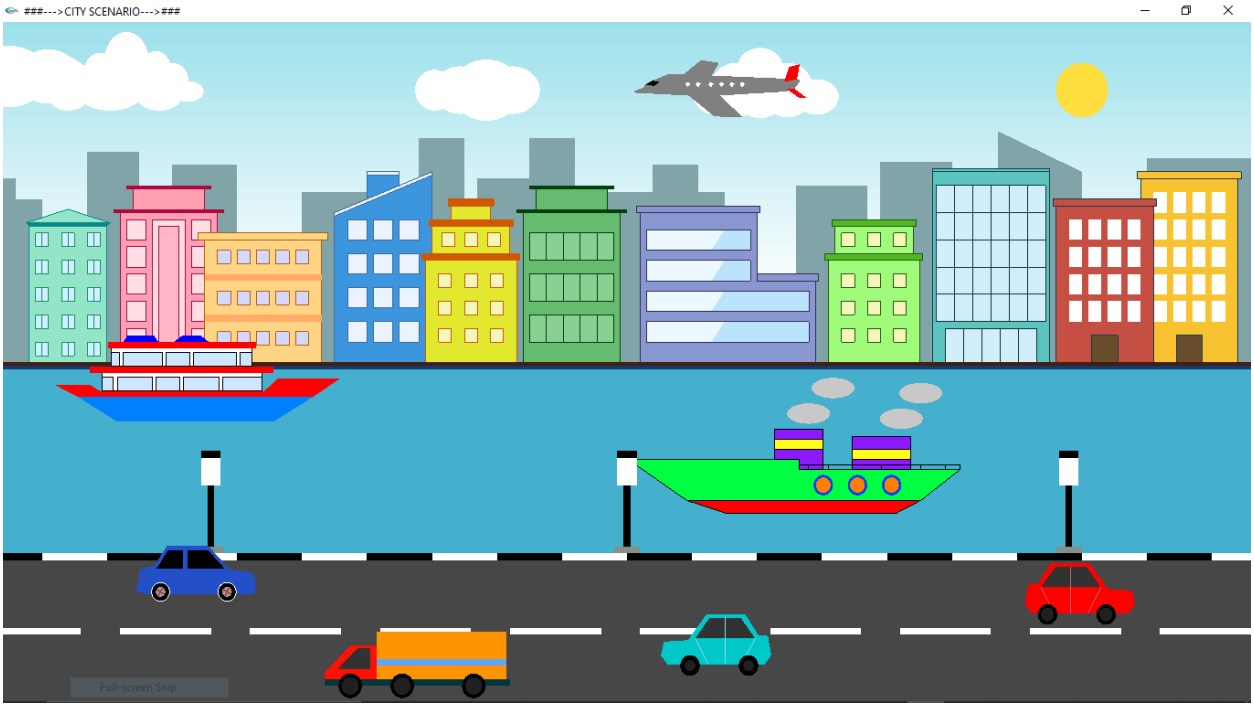
In this project, we mainly draw 2D models by mathematical formulas and geometric primitives. It helps to stimulate creative thoughts, increase observational skills, and develop visual artwork ideas in all mediums. And it also helps in plotting ideas, developing plans, and helping predict outcomes in daily life. By this project, we can visualization of a city view which makes us be able to tell stories and communicate emotions and ideas.

6. Conclusion:

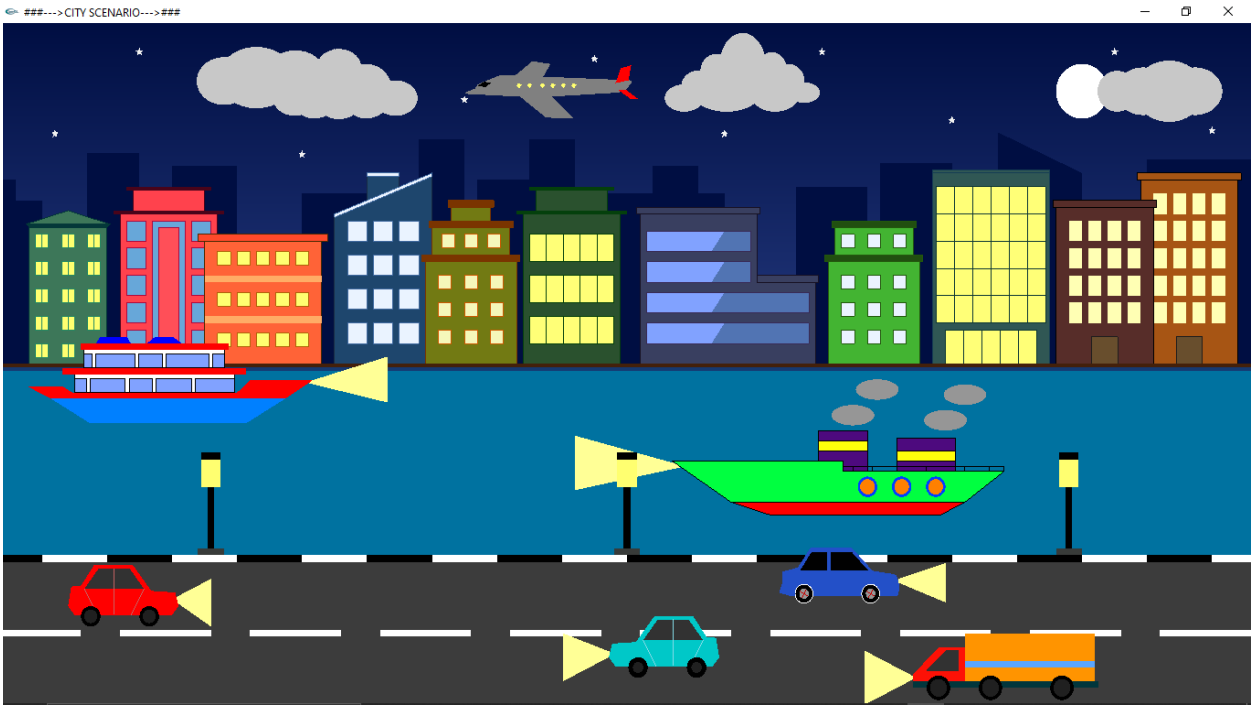
This project is one of the sample projects on Computer Graphics. Though many difficulties were faced during the project as well as many errors occurred, we became succeed in compile and run the program. There may be some limitations on this project as well. So, soon, we would like to be hopeful for further improvements. We have implemented an automatic view of the city scenario where objects are automatically time lapsing day or night. OpenGL supports enormous flexibility in the design and the use of OpenGL graphics programs. The presence of many built-in classes methods takes care of much functionality and reduces the job of coding as well as makes the implementation simpler. We have implemented the project making it user-friendly and error-free as possible. In the future, we would like to develop this project into a 3D architecture that can turn this into more eye soothing to the user.

7. Screenshot of the system:

Day View



Night View



Command Screen