American International University-Bangladesh (AIUB)
Department of Computer Science

Faculty of Science & Technology (FST)

Village Scenario with Day-Night Transition using OpenGL/GLUT in C++

Semester: Fall 25-26

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1. INTRODUCTION

Project Type: A 2D computer graphics scene developed with C++ and OpenGL/GLUT.

Project Description: The village environment is created by combining geometric primitives such as polygons, circles, and semicircles.

Scene Elements: The scenario includes sky, sun/moon, clouds, hills, trees, houses, road, river, and boat.

Main Objective: To demonstrate fundamental computer graphics concepts—2D modeling, scene composition, coloring, and timer-based animation.

Day/Night Interaction (Keyboard):

- Initially in Day Mode. Press '**N**' to switch to night mode (dark sky, moon, dim environment, glowing house windows).
- Press '**D**' to switch back to day mode (bright sky, sunlight, normal colors).
- Press '**0**' to exit scenario.

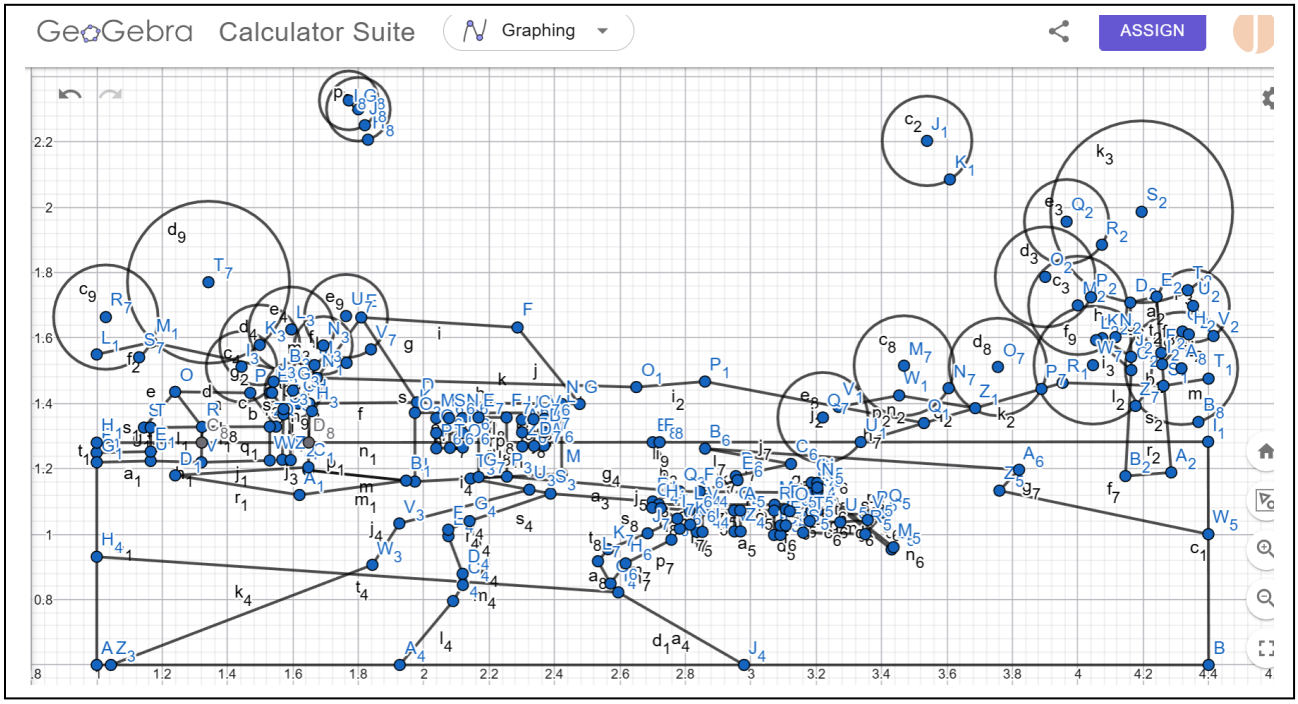
Cloud Speed Control (Mouse):

- **Right** mouse click **increases** cloud speed (simulates stronger wind).
- **Left** mouse click **decreases** cloud speed (calmer atmosphere).

Animation Features: Moving clouds and slight tree movement make the scene dynamic and more realistic.

Overall Outcome: The project presents an interactive 2D village simulation showing how user input can control rendering and animation in real time using OpenGL/GLUT.

2. PROJECT GRAPH



3. LIST OF OBJECTS ASSIGNING AN OBJECT ID

SL#	Object ID	Object Name
1.	947M	Mud
2.	947SM	Sun & Moon
3.	947C0	Static Clouds
4.	947C1	Moving Cloud 1
5.	947C2	Moving Cloud 2
6.	947H	Hills
7.	947T1	Tree (Left)
8.	947T2	Tree (Right)
9.	947SH	Small House
10.	947BH	Big House
11.	947R	River
12.	947Road	Road
13.	947B	Boat

4. LIST OF FUNCTIONS TO REPRESENT OBJECTS

SL#	Function Name	Object_ID
1.	mud()	947M
2.	sun()	947SM
3.	cloud()	947C0
4.	cloud1()	947C1
5.	cloud2()	947C2
6.	hill()	947H
7.	tree1()	947T1
8.	tree2()	947T2
9.	sHouse()	947SH
10.	bHouse()	947BH
11.	river()	947R
12.	road()	947Road
13.	boat()	947B

5. LIST OF ANIMATION FUNCTIONS WITH ID

SL#	Animation Function	Animation Function ID
1.	updateCloud1(int)	947uC1
2.	updateCloud2(int)	947uC2
3.	updateTree1(int)	947uT1
4.	updateTree2(int)	947uT2
5.	keyboard(unsigned char key, int, int)	947Key
6.	mouse(int button, int state, int, int)	947MI

6. CONCLUSION

This project successfully demonstrates how C++ with OpenGL/GLUT can be used to build a complete 2D village environment by combining basic shapes into a structured scene with multiple objects and layers. It includes real-time interactivity through keyboard controls to switch between day and night modes, along with animated elements like moving clouds and tree motion to make the scenario dynamic. Additionally, mouse input is used to control cloud speed, showing how user events can directly influence animation parameters and improve overall realism.