ITT 036 - Digital Signal Generator
Project Report

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Objective: To design a program that generates and visualizes digital signals using different line coding and modulation techniques with OpenGL.

Language Used: C++

Libraries Used: <**iostream**> (I/O), <**cstring**> (strings), <**cmath**> (math), **GL/glut.h** (OpenGL visualization).

Assumptions: Inputs are valid. Bit duration and voltage levels are constant. OpenGL and GLUT are pre-installed.

How to Run:
1. Install MinGW/GCC and FreeGLUT.
2. Compile using: g++ -o design.exe design.cpp -lfreeglut -lopengl32 -lglu32
3. Run: ./design
4. Follow prompts to enter data and view waveform.

Output:
1. Encoded signal printed numerically in terminal.
2. Real-time waveform plot in OpenGL window.
3. X-axis: Bit positions / time slots, Y-axis: Voltage levels.
4. Title: Encoding scheme used (e.g., Manchester Encoding).

Applications: Useful for learning digital communication and signal visualization concepts.

References:
1. Guidance and mentorship by **Dr Iqra Altaf Gilani**, Faculty, National Institute of Technology, Srinagar
2. William Stallings – Data and Computer Communications.
3. OpenGL.org.
4. TutorialsPoint & GeeksforGeeks – Digital Communication

Conclusion: The project effectively demonstrates data representation using various encoding and modulation schemes with C++ and OpenGL visualization.