DC ASSIGNMENT

The Line Encoder Visualization project is a C++ application leveraging the Simple DirectMedia Layer (SDL) library to craft an intuitive graphical user interface. Its primary objective is to dynamically illustrate digital and analog line encoding waveforms. The focus lies in delivering a user-friendly platform allowing seamless parameter adjustments—such as frequency and amplitude—to generate and visualize precise waveforms. Through this interface, users can interactively explore encoding techniques with ease.

Libraries and Languages:-

- Language used:- C++
- Library :- SDL , SDL_ttf

Logic Implementation:-

Digital Mode Logic:

- The program manages distinct menu items for both digital and analog modes.
- Users select options from the menu, and the chosen item is displayed on the dropdown title.
- Logic is integrated to render input fields and process user input effectively.
- Implemented Encoding Techniques: NRZ-L, NRZ-I, Manchester, Differential Manchester, AMI, and specific scramble techniques (B8ZS, HDB3).

Analog Mode Logic:

- Analog mode involves the creation of continuous waveforms based on user-defined parameters.
- The "draw continuous wave" function takes charge of rendering the continuous waveform through the SDL renderer.

- Input fields are provided for user-defined parameters like frequency and amplitude.
- Waveform generation involves a user-defined mathematical function incorporating frequency, amplitude, and time parameters to create the waveform accurately.

Graphics Implementation:-

- SDL library forms the core of graphics implementation.
- Utilization of SDL renderer facilitates drawing diverse graphical components like input fields, buttons, and waveform visualizations.
- Effective management of user input events such as key presses and mouse clicks enables seamless interaction between users and graphical elements.

Executing the code:-

- **Modular Structure:**

  Various aspects of the application are encapsulated within distinct functions and structures, following a modular design approach.

- **SDL Initialization:**

  The program initializes an SDL window and renderer, enabling user interaction through a graphical user interface.

- **Mode Selection:**

  Users can choose between digital and analog modes via radio buttons.

- **Digital Mode Functionality:**

  In digital mode, the program provides functionalities pertaining to digital line encoding techniques.

- **Analog Mode Functionality:**

Analog mode manages continuous waveform operations, accessible through a dropdown menu.

Group Members :- Ruchi(2021BITE039), Diya(2021BITE022), Snigdha(2021BITE026)

* The End *