Line Coding Encoder and Scrambler

Made by Tushar Verma (Enrollment: 2021BITE065)

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Overview

This project involves implementing a Line Coding Encoder and Scrambler with a digital data generator. The assignment includes the generation of a random data sequence, encoding using various line coding schemes (NRZ-L, NRZ-I, Manchester, Differential Manchester, AMI), and optional scrambling using B8ZS or HDB3. The code also identifies the longest palindromic sequence in the generated data.

Line Encoder GUI

This is a Line Encoder GUI implemented using PySimpleGUI, Matplotlib, and NumPy. It provides an interface for encoding and decoding various line encoding schemes.

How to Run

1. Install the required libraries:

```
pip install PySimpleGUI matplotlib numpy
```

2. Launch the GUI.
3. Initialize random input or enter custom input.
4. Encode the data using a selected encoding scheme.
5. Optionally, decode the encoded data.
6. Visualize the input, encoded, and decoded data using the "Show Graph" button.

Examples

Initializing Random Input: Random Input
Entering Custom Input: Custom Input

Assumptions

The format used is Manchester, and differential Manchester is G.E Thomas format.

How to Run the Code

1. Ensure you have Python installed on your machine.
2. Clone the repository:

```
https://github.com/tusharv01/Line_Coder.git
```

3. Navigate to the project directory:

```
cd Line_Coder
```

4. Run the main program:

```
python LineEncoder.py
```

   or using the LineEncoder.ipynb file run the program using Jupyter Notebook. A dialog box opens on which you can operate.

Jupyter Notebook Guide

1. Install Jupyter Notebook:

```
pip install notebook
```

2. Navigate to the directory containing the .ipynb file.
3. Start the Jupyter Notebook server:

```
jupyter notebook
```

4. Access the Notebook in your web browser.
5. Run cells in the notebook to interact with the program.

Note: Clicking on the graphs icon on the GUI prints all the scheme graphs automatically.

Submitted to: Dr. Iqra Altaf

THANK YOU