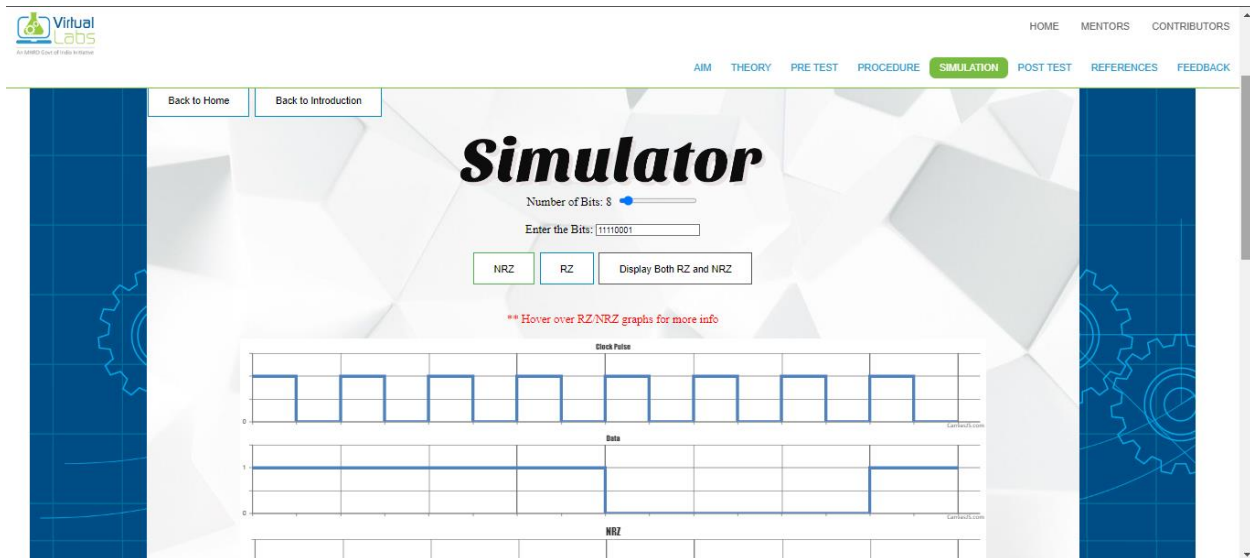


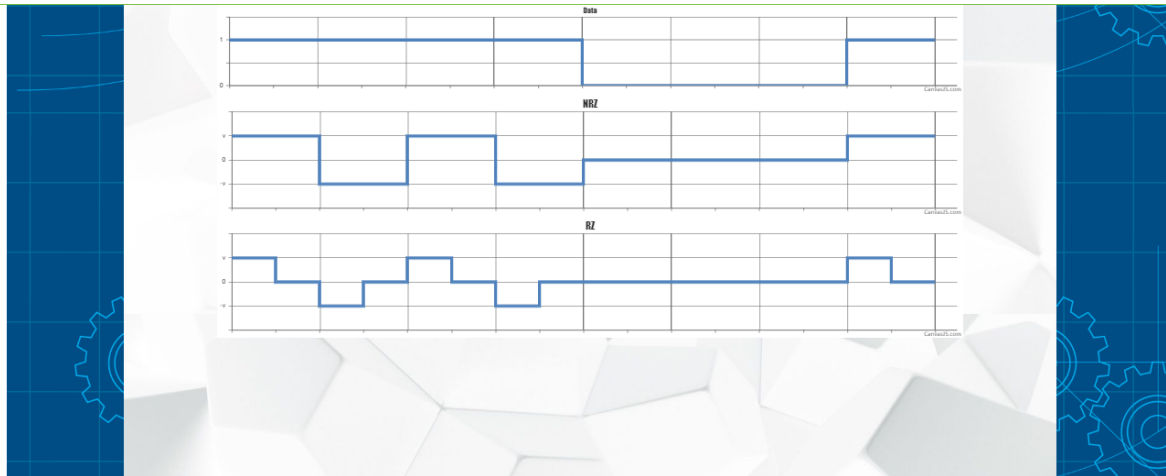
Batch: SY-IT(B3)**Experiment Number: 7****Roll Number: 16010423076****Name: Ritesh Jha**

Aim of the Experiment: Explore the virtual lab on generation of bipolar RZ and NRZ line codes.

Program/ Steps:


1. The aim of this experiment is to study the generation of Bipolar RZ and NRZ line codes.
 2. Navigate to the website of ebootathon and read the theory related to this experiment.
 3. Then go to the simulation page to actually perform the v-lab.
 4. Set the number of bits for which you want to generate the Bipolar RZ or NRZ lines.
 5. Enter the actual bits for the selected number.
 6. Generate the line code.
-

Output/Result:



Quiz :

Pre-test


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Digital Communication Lab (KEC-651)

To Study the generation of Bipolar RZ and NRZ line codes.

Pre Test

Why do we need Line Coding Techniques?

- ☒ a : Transmission of a digital signal over a transmission line
- ☐ b : Digital to Analog
- ☐ c : Analog to Digital
- ☐ d : None of the options

What is the scheme of Bipolar Line Coding?

- ☒ a : Bi-polar encoding is a type of return-to-zero (RZ) line code, where two nonzero values are used, so that the three values are +, -, and zero.
- ☐ b : Positive voltage represent '0' and Zero voltage represent negative
- ☐ c : Positive voltage represent '1' and Zero voltage represent '0'.
- ☐ d : None of the options.

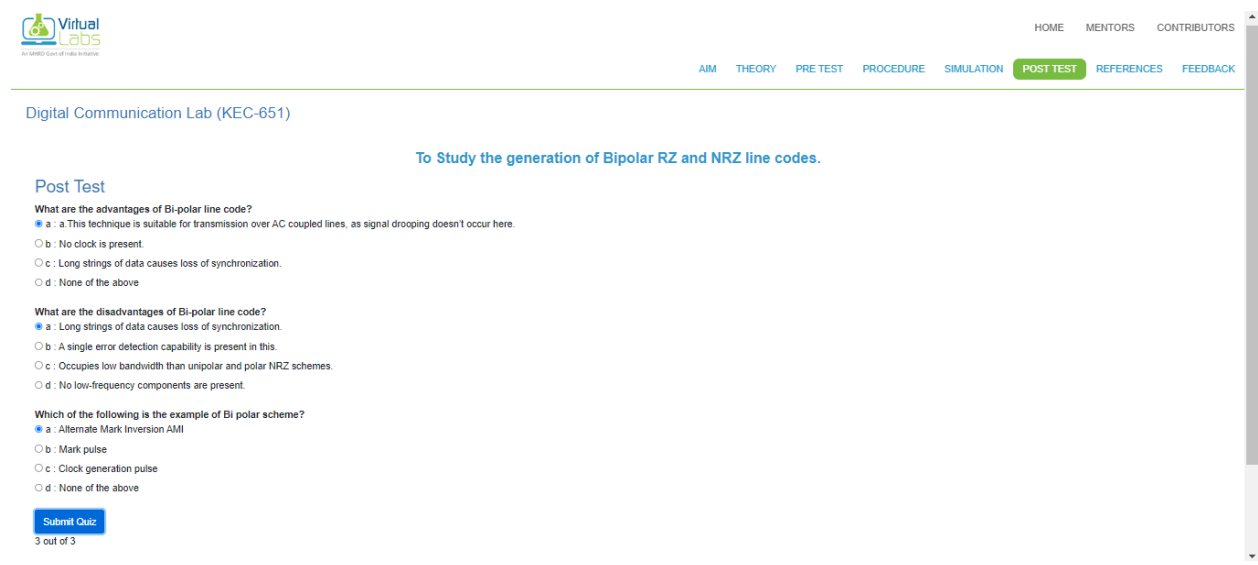
What is Bipolar NRZ also called as?

- ☒ a : Duobinary signal
- ☐ b : Doubly signal
- ☐ c : Both (a) and (b)
- ☐ d : None of the above

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Post-test



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AIM THEORY PRE TEST PROCEDURE SIMULATION **POST TEST** REFERENCES FEEDBACK

Digital Communication Lab (KEC-651)

To Study the generation of Bipolar RZ and NRZ line codes.

Post Test

What are the advantages of Bi-polar line code?

- ☒ a : a.This technique is suitable for transmission over AC coupled lines, as signal drooping doesn't occur here.
- ☐ b : No clock is present.
- ☐ c : Long strings of data causes loss of synchronization.
- ☐ d : None of the above

What are the disadvantages of Bi-polar line code?

- ☒ a : Long strings of data causes loss of synchronization.
- ☐ b : A single error detection capability is present in this.
- ☐ c : Occupies low bandwidth than unipolar and polar NRZ schemes.
- ☐ d : No low-frequency components are present.

Which of the following is the example of Bi polar scheme?

- ☒ a : Alternate Mark Inversion AMI
- ☐ b : Mark pulse
- ☐ c : Clock generation pulse
- ☐ d : None of the above

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3 out of 3

Post Lab Question-Answers:

1. Why do we need Line Coding Techniques?

Ans : Line coding converts **digital data** into a **digital signal format** that can be transmitted over physical media. This is essential for effectively communicating binary data. Certain line coding schemes include timing information, which helps the receiver maintain synchronization with the transmitter. This is crucial for accurately interpreting the signal. Overall, line coding is a critical aspect of digital communication systems that helps ensure effective data transmission while addressing various technical challenges.

2. What is the scheme of Bipolar Line coding?

Ans: Bipolar line coding is a line coding scheme that uses **three voltage levels, positive, negative, and zero**, to represent logic states: One bit of data is represented by a zero voltage level. The other bit alternates between positive and negative voltage levels

Outcomes:

CO4. Execute their knowledge of computer communication principles, including Error detection and correction, multiplexing, flow control, and error control

Conclusion (based on the Results and outcomes achieved):

In this experiment, I learned about RZ (Returns to zero in the middle of the bit) and NRZ (Non-return to zero) line codes. We generated the RZ and NRZ codes from the virtual lab link. I did that by entering the number of bits and then the bit values. Later in the experiment, I also understood the theory related to line coding techniques.

References:

Books/ Journals/ Websites

- <https://ebootathon.com/labs/beta/ec/DigitalCommunicationLab/exp3/pretest.html>