Data Communications Assignment

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1 Different Line Coding Techniques

1. Not Return To Zero Level (NRZ-L)
2. Not Return To Zero Invert (NRZ-I)
3. Manchester
4. Differential Manchester
5. Alternate Mark Inversion (AMI)
6. Scrambling (B8ZS & HDB3)

2 References:

IDE used: DEV C++
Programming Language: C++
Standard Library: Open-GL
Header File: glut.h

To run the project, use the project source code in dev C++ (already configured with openGL library) and follow the instructions on the output screen.

Manachar Algorithm was used to decrease the time complexity to **linear O(n)** for finding the longest palindrome in the data stream.

3 Implementation of all above line coding techniques.

To implement these techniques in C++ we require **open-GL**

Open Graphics Library (OpenGL) is a cross-language, cross-platform application programming interface (API) for rendering 2D and 3D vector graphics. The API is typically used to inter- act with a graphics processing unit (GPU), to achieve hardware- accelerated rendering.

Functions we used in the project:-

1. **glClearColor(r,g,b,0.0)**: This function is used to set the background color of the open-GL window.
2. **glMatrixMode (GL PROJECTION)**: This function is used to plot projected type geometry figures.
3. **gluOrtho2D (0.0, 200.0, 0.0, 150.0)**: Used to create 2D plane and set coordinates of open-GL window.
4. **glPushMatrix()**: It is used to push and pop the current matrix.
5. **glLoadIdentity()**:It replaces the current matrix with the identity matrix.
6. **glPushAttrib(GL DEPTH TEST)**:It is used to push and pop the server attribute stack.
7. **glDisable(GL DEPTH TEST)**:Its used to enable or dis- able serverside GL capabilities.
8. **glRasterPos2i(x,y)**: Its specifies the raster position for pixel operations.
9. **glutBitmapCharacter(GLUT BITMAP 9 BY 15, String[i])**: It is used to write text in open-GL window.

10. **glPopAttrib()**: It is used to pop pushed attribute to the window.
11. **glColor3f(0.0, 0.0, 0.0)**: It is used to set the color of lines,points,text etc etc using value of R,G,B.
12. **glLineStipple(1,0xAAA0)**: It specifies the line stipple pattern. **13. glEnable(GL LINE STIPPLE)**: It enables us to draw a dashed line.
14. **glBegin(GL LINES)**: It tells us that line drawing begins from here.
15. **glVertex2i(x,y)**: It provides coordinates of vertex of the line.
16. **glEnd()**:It tells line drawings ends here.
17. **glLineWidth(1.0)**: It is used to set the width of the line.
18. **glPointSize(5.0)**:It is used to set the diameter of the point.
19. **glBegin(GL POINTS)**: It tells us that point drawing be- gins from here.
20. **glutInit(&argc,argv)**:It is used to initialize the GLUT Library.
21. **glutInitDisplayMode (GLUT SINGLE | GLUT RGB)**:It sets the initial display mode.
22. **glutInitWindowSize (500, 400)**: It defines the size of open-GL window.
23. **glutInitWindowPosition (400, 100)**: It sets the initial position of open-GL window.
24. **glutDisplayFunc(display)**: it is used to display graph contents on the window.

LINKS:

1. https://cplusplus.happycodings.com/beginners-labassignments/code40.html (rough idea of different encodings)

We tried our best to complete the Assignment.

THANK YOU!