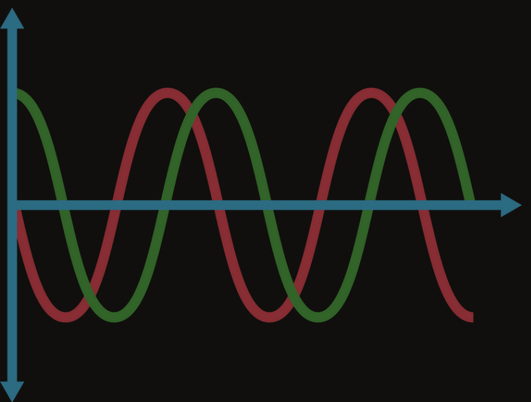
Department of Electronics Engineering

Walchand College of Engineering, Sangli

(Government-Aided Autonomous Institute)

Mini Project A.Y. 2023-2024

course name : Embedded System Design Lab
(Graphical LCD)



Under the guidance of

Prof.S.Khedkar Sir

IMAGE & ANIMATION BOARD USING GLCD & LPC2138

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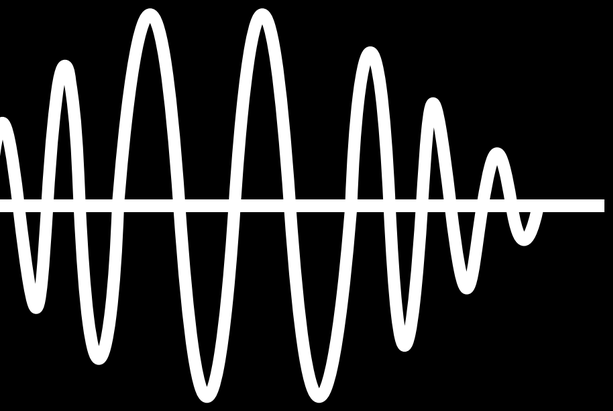
CONTENT

- INTRODUCTION
- OBJECTIVE
- NEED OF GLCD
- COMPONENTS REQUIRED
- CIRCUIT DIAGRAM
- ALGORITHM
- APPLICATION
- CONCLUSION

INTRODUCTION



- Enhanced User Experience
- Data Visualization
- Real-time Feedback
- Customizability
- Communication

OBJECTIVES

Objective 1

To successfully establish a connection between the LPC2138 microcontroller and the Graphical Liquid Crystal Display (GLCD).

Objective 2

To Enable LPC2138 to Display Images on GLCD via Serial Communication Input.

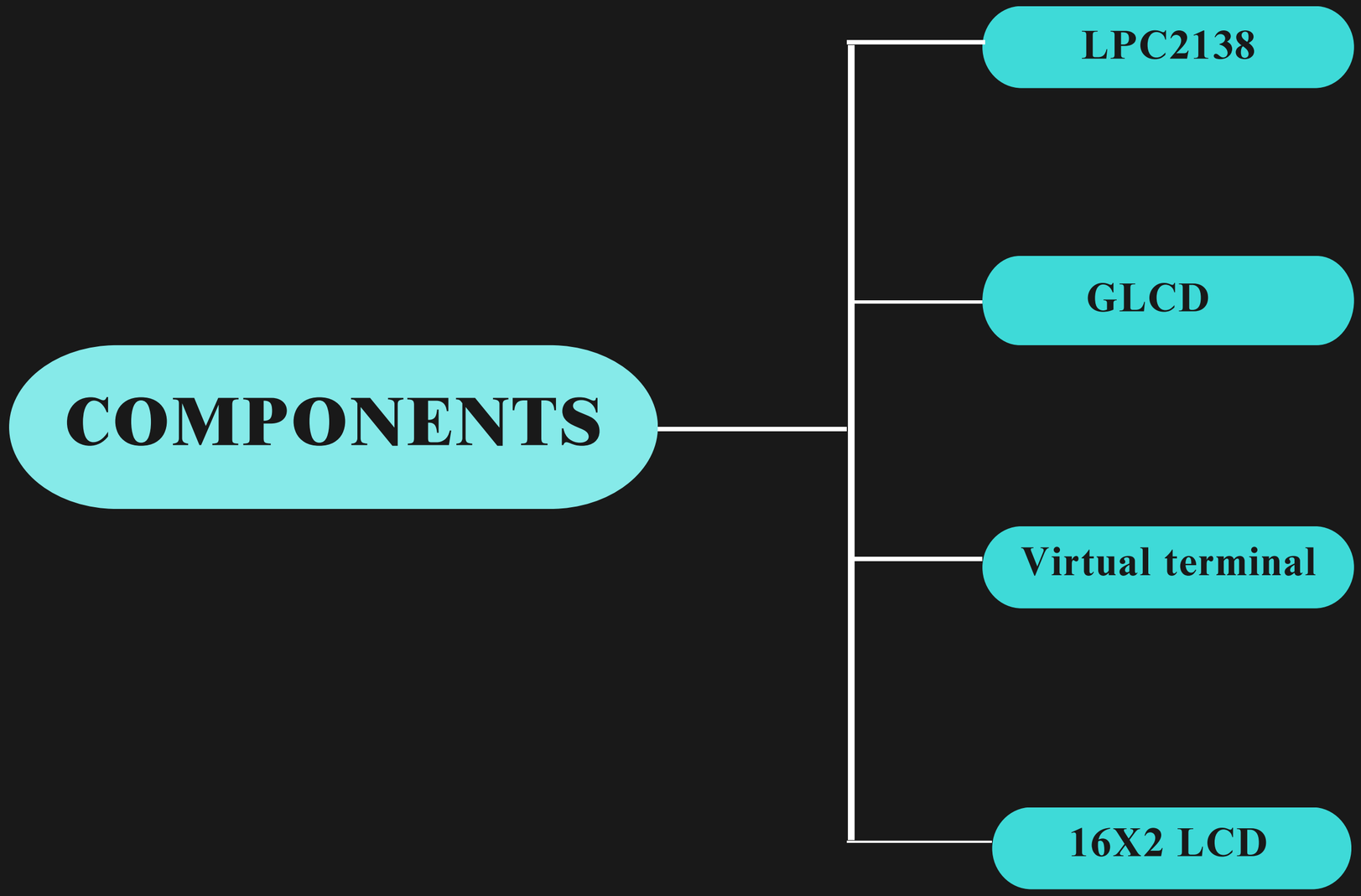
Objective 3

To demonstrate the capability of the LPC2138 microcontroller to display images on the GLCD.

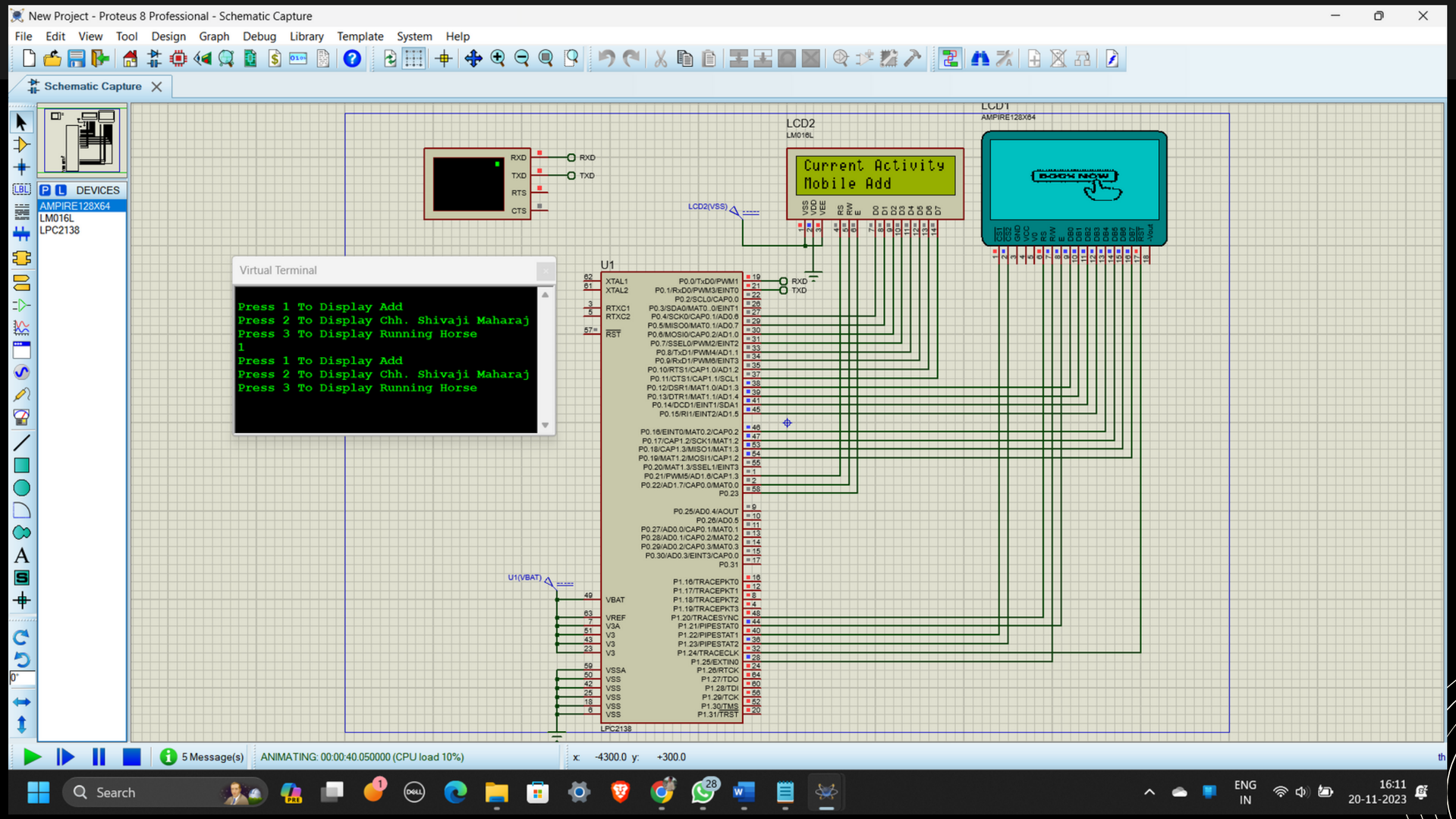
NEED OF GRAPHICAL LCD

- Enhanced User Interaction
- Information Visualization
- Complex Data Representation
- Dynamic Content

GLCDs have revolutionized the way users interact with modern electronics and embedded systems by offering superior graphical capabilities that transcend the limitations of traditional text-based displays. Their ability to convey information, engage users, and enhance the overall user experience makes them an indispensable component in today's technology landscape.


COMPONENTS
LPC2138
GLCD
Virtual terminal
16X2 LCD

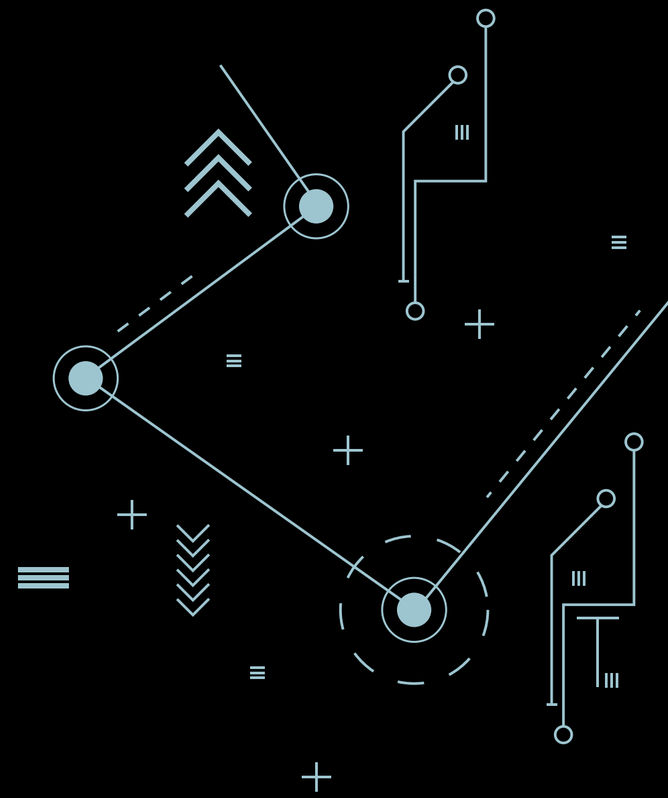
CIRCUIT DIAGRAM



ALGORITHM

1. Initialize UART for communication with virtual terminal using pins P0.0 (RX) and P0.1 (TX).
2. Initialize GLCD communication using data pins connected to the LPC2138.
3. Set up necessary parameters for GLCD operation, such as screen resolution and pixel format.
4. Create functions to receive commands and data from the virtual terminal through UART.
5. Implement functions to interpret commands received from the virtual terminal and perform corresponding actions on the GLCD, such as displaying images or animations.
6. Check for incoming commands and data from the virtual terminal, and update the GLCD display accordingly.

APPLICATIONS



Consumer Electronics

- Smart Home Control Panels
- Infotainment Systems

Industrial Control Systems

- Human-Machine Interfaces
- Process Control

Medical Devices

- Medical Monitors
- Medical Imaging

APPLICATIONS

Instrumentation and Measurement Devices

- Data Loggers
- Oscilloscopes

Gaming and Entertainment

- Handheld Game Consoles
- Digital Audio Workstations (DAWs)

Point-of-Sale (POS) Systems

- Graphical POS Terminals

CONCLUSION

- Successfully interfaced the LPC2148 microcontroller with a GLCD, showcasing the ability to control and display graphical content.
- Developed an efficient algorithm for displaying images on the GLCD, including image conversion and positioning.
- Gained insights into the importance of graphical displays in enhancing user interaction and data visualization in embedded systems.

THANK YOU !