Text to Braille Converter

Problem statement:

Visually impaired individuals face major challenges in accessing spoken or written information through touch.

Although Braille is a powerful tool for literacy and communication, affordable and real-time systems that convert text input into Braille output are still lacking.

Existing solutions are often expensive, bulky, or limited in functionality, making them inaccessible to many users.

Main purpose:

Deafblind people are unable to hear or see. Thus, regular communication is very hard for them. They need the sense of touch (Braille system) to communicate. But not everyone is aware of the Braille language. Our device bridge the gap between these two people.

Names of Components used:

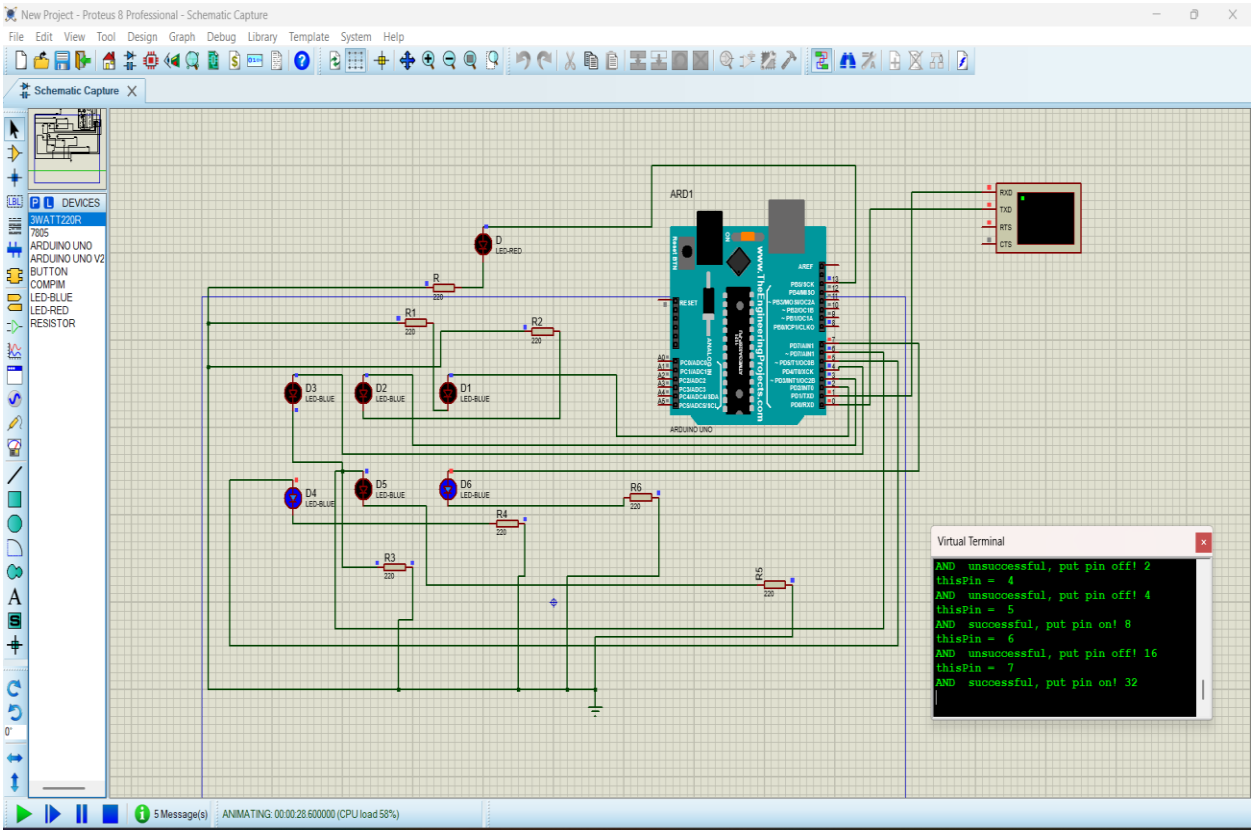
- Arduino UNO
- LED's
- Resistors

- Text Input module
- Virtual monitor
- Power Supply
- Wire

Literature Survey:

- ❖ People who are blind or deafblind often struggle to access spoken or written information.
- ❖ Braille helps them read by feeling raised dots, but most Braille devices:
  - ➢ Are very expensive
  - ➢ Are not easy to carry
  - ➢ Are difficult for many people to use
- ❖ Some systems can convert:
  - ➢ Speech into text
  - ➢ Text into Braille But these systems are not designed for everyone and can be hard to operate.
- ❖ This project aims to solve these problems by using:
  - ➢ Simple components like Arduino and LED lights
  - ➢ A system that converts text into glowing LEDs
  - ➢ LEDs arranged to show Braille letters through light
- ❖ This makes it easier for deafblind individuals to understand messages using their sense of touch.

Circuit Simulation:



How It Works:

When we run the Proteus simulation for the blind system, a pop-up window for the virtual terminal appears. In that terminal, we have to type the input text, and the output is displayed according to the Braille conversion table:

For Numbers:

Char	ASCII	Binary	LEDs ON
0	48	011000	D3, D4, D5
1	49	100001	D6
2	50	101000	D4, D6
3	51	110000	D5, D6
4	52	100100	D3, D5, D6
5	53	100100	D3, D6
6	54	110110	D3, D5, D6
7	55	111000	D3, D4, D5, D6
8	56	111000	D3, D4, D5, D6
9	57	011000	D4, D5

And for alphabets:

Char	ASCII	Binary	LEDs ON
A	65	100000	D6
B	66	101000	D4, D6
C	67	110000	D5, D6
D	68	110100	D3, D5, D6
E	69	100100	D3, D6
F	70	111000	D4, D5, D6
G	71	111100	D3, D4, D5, D6
H	72	101100	D3, D4, D6
I	73	011000	D4, D5
J	74	011100	D3, D4, D5
K	75	100010	D2, D6
L	76	101010	D2, D4, D6
M	77	110010	D2, D5, D6
N	78	110110	D2, D3, D5, D6
O	79	100110	D2, D3, D6
P	80	111010	D2, D4, D5, D6

Q	81	111110	D2, D3, D4, D5, D6
R	82	101110	D2, D3, D4, D6
S	83	011010	D2, D4, D5
T	84	011110	D2, D3, D4, D5
U	85	100011	D1, D2, D6
V	86	101011	D1, D2, D4, D6
W	87	011101	D1, D3, D4, D5
X	88	110011	D1, D2, D5, D6
Y	89	110111	D1, D2, D3, D5, D6
Z	90	100111	D1, D2, D3, D6

Synopsis:

This project aims to help deafblind individuals communicate more easily by converting text into Braille using light.

The problem is that most Braille devices are expensive, bulky, and hard to use. To solve this, we designed a low-cost system using simple components like Arduino, LEDs, resistors, and a text input module.

The system works by taking text input, converting each character into ASCII code, and then lighting up LEDs in a Braille pattern.

This allows users to feel the Braille letters through light-based touch, making communication more accessible and affordable.