GAZİ UNIVERSITY

FACULTY OF ENGINEERING

DEPARTMENT OF ELECTRICAL & ELECTRONIC ENGINEERING

EEE306 / CENG318 - MICROPROCESSOR PROJECT

ELECTRICAL ELECTRONICS ENGINNERING - COMPUTER ENGINEERING DEPARTMENTS INTERDISCIPLINARY WORK

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1.INTRODUCTION

A light pattern is the arranged or structured arrangement of light in different ways. Light can be controlled and directed in various ways to create a specific pattern or arrangement. These patterns are often created using specialized light sources, reflectors, lenses, or optical elements. Light patterns are used in many different applications.

The aim of this project is to create different shapes and patterns using values read from 4x4 keypads and 8-bit light patterns generated in the binary number system.

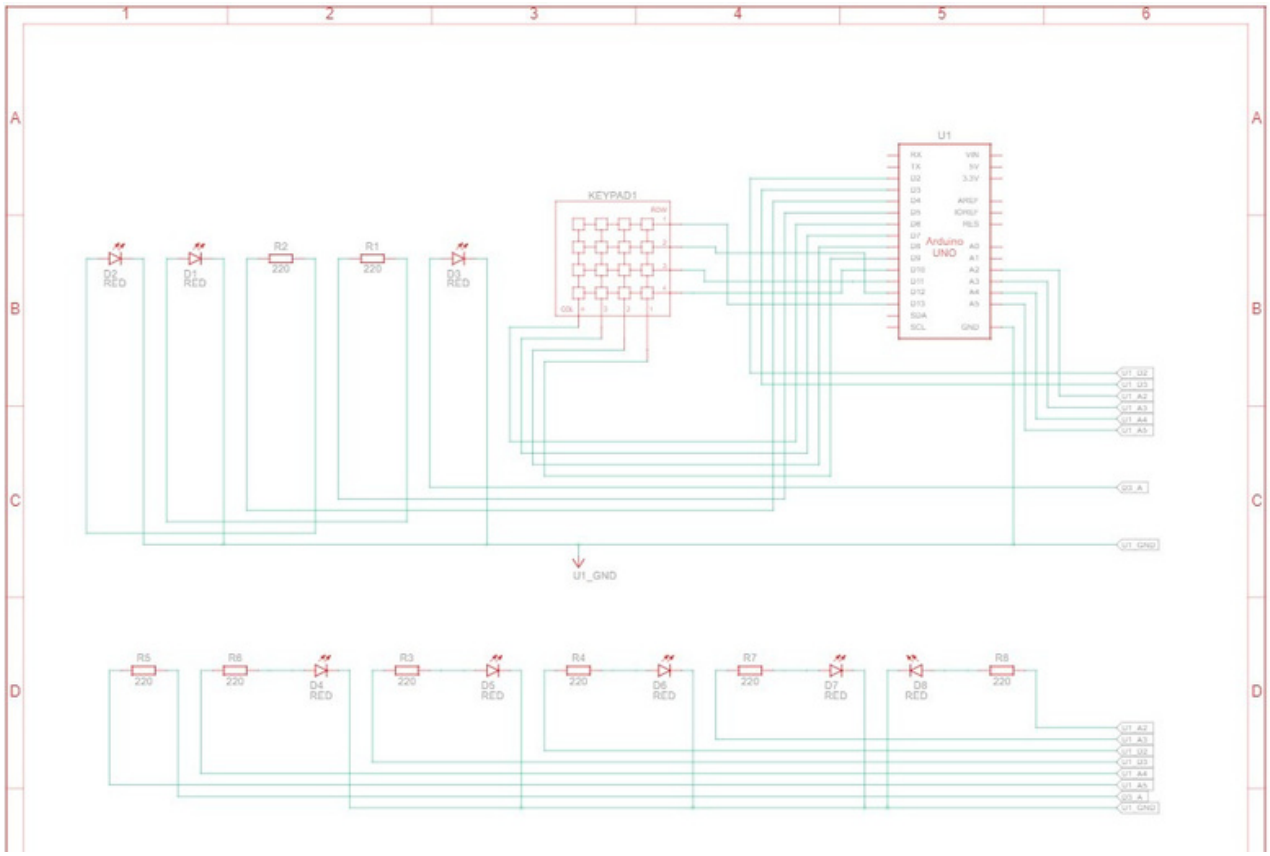
2.HARDWARE COMPONENTS

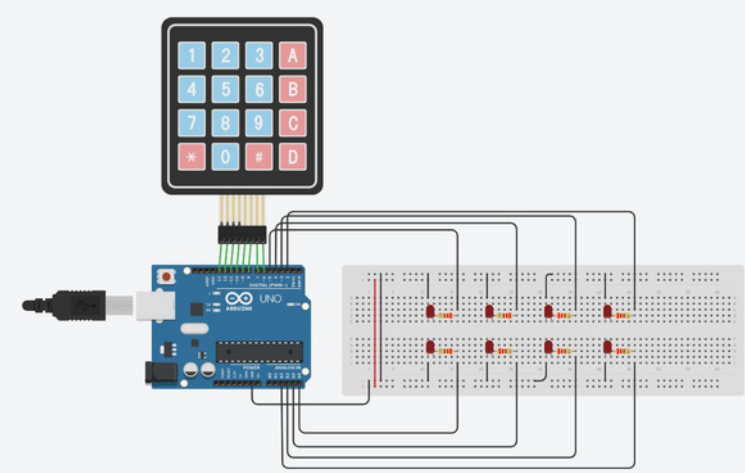
1. ARDUINO UNO
2. ARDUINO BREADBOARD
3. JUMPER WIRES
4. 8 x 220 OHM RESISTANCE
5. 8 x LED
6. 4 x 4 KEYPAD

3.HARDWARE COMPONENTS

1. ARDUINO UNO IDE

4.ESTIMATED SCHEMATIC OF THE CIRCUIT





5.ESTIMATED COMBINATION OF LIGHT PATTERNS

The aim of this project is to create different shapes and patterns using values read from 4x4 keypads and 8-bit light patterns generated in the binary number system.

In this circuit, which is established as a guess, the row and column connections of the keypad are provided with digital pins between 13 and 6. The anode ends of the LEDs are connected to the remaining digital pins and to the analog pins that can be used as digital pins when necessary.

Since there are 16 buttons, 16 different light patterns should be determined, and each light pattern should have 8 different state combinations for the LEDs within their own patterns to change their sequence. The selected patterns among these combinations are listed below.

LIGHT PATTERN 1	LIGHT PATTERN 2	LIGHT PATTERN 3
0000 0001	1111 1110	1000 0000
0000 0010	1111 1101	1010 0000
0000 0100	1111 1011	1010 1000
0000 1000	1111 0111	1010 1010
0001 0000	1110 1111	0000 0001
0010 0000	1101 1111	0000 0101
0100 0000	1011 1111	0001 0101
1000 0000	0111 1111	0101 0101

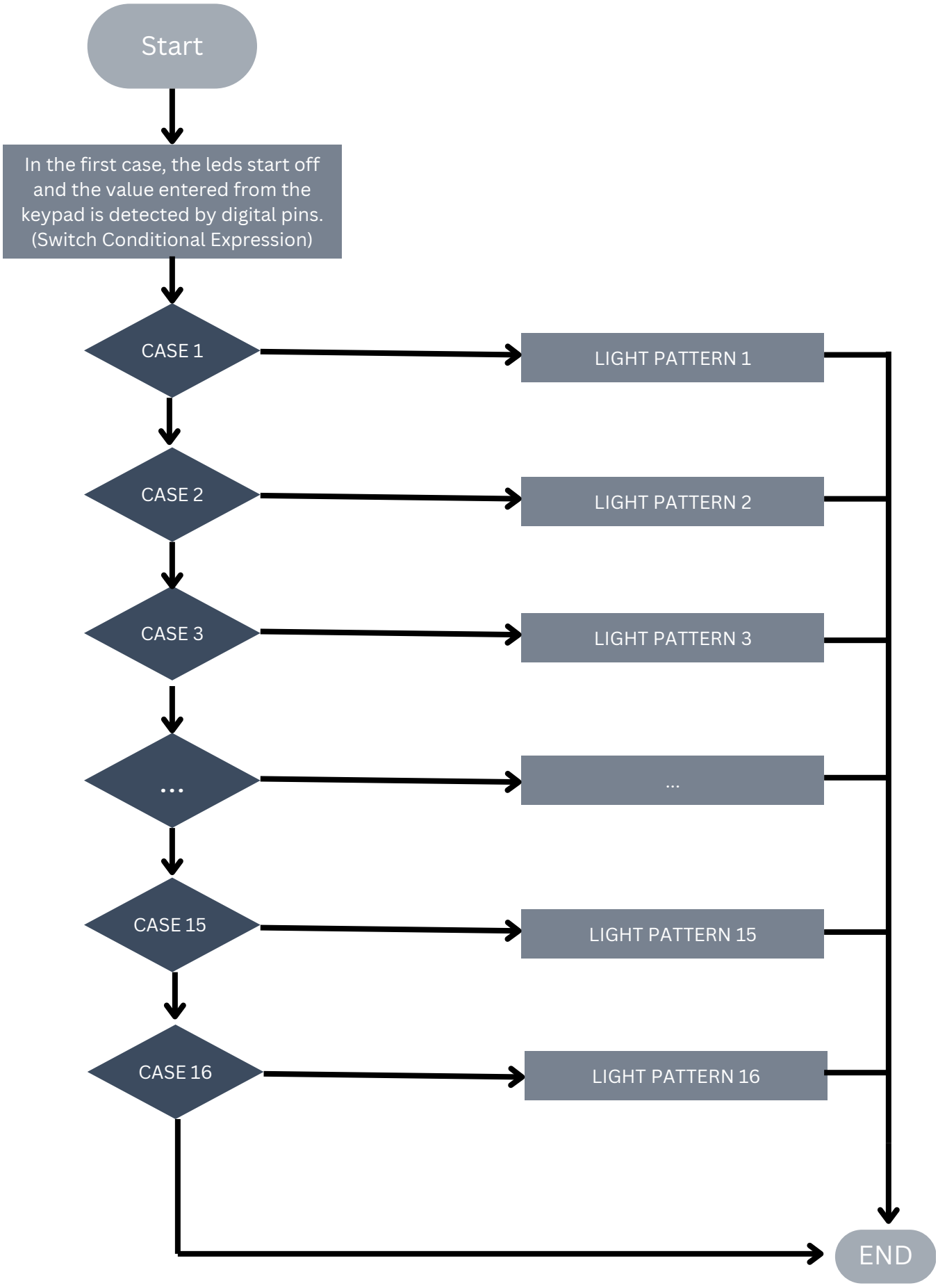
LIGHT PATTERN 4	LIGHT PATTERN 5	LIGHT PATTERN 6
1000 0000	0111 1111	0000 0001
0100 0000	1011 1111	0000 0101
0010 0000	1101 1111	0010 0101
0001 0000	1110 1111	0101 0101
0000 1000	1111 0111	1000 0000
0000 0100	1111 1011	1010 0000
0000 0010	1011 1101	1010 1000
0000 0001	0111 1110	1010 1010

LIGHT PATTERN 7	LIGHT PATTERN 8	LIGHT PATTERN 9
0000 0011	1000 0001	1000 0001
0000 0110	1100 0011	1100 0011
0000 1100	1110 0111	1110 0111
0001 1000	1111 1111	1111 1111
0011 0000	0111 1110	1110 0111
0110 0000	0011 1100	1100 0011
1100 0000	0001 1000	1000 0001
1000 0001	0000 0000	0000 000

LIGHT PATTERN 10	LIGHT PATTERN 11	LIGHT PATTERN 12
0001 1000	1010 1010	1000 0000
0011 1100	0101 0101	1100 0000
0111 1110	1010 1010	1110 0000
1111 1111	0101 0101	1111 0000
1110 0111	1010 1010	1111 1000
1100 0011	0101 0101	1111 1100
1000 0001	1010 1010	1111 1110
0000 0000	0101 0101	1111 1111

For now, it may vary. Because of that other keypads will be loaded with different purposes.

6.FLOWCHART


Start
In the first case, the leds start off and the value entered from the keypad is detected by digital pins. (Switch Conditional Expression)
CASE 1
LIGHT PATTERN 1
CASE 2
LIGHT PATTERN 2
CASE 3
LIGHT PATTERN 3
...
...
CASE 15
LIGHT PATTERN 15
CASE 16
LIGHT PATTERN 16
END

7.GAZİ UNIVERSITY ELECTRICAL ELECTRONICS - COMPUTER ENGINEERING DEPARTMENTS INTERDISCIPLINARY WORK MEETING MINUTES

1 st Meeting of The Project

PROJECT TOPIC : Different Light Pattern

Meeting Date : 16.05.2023

Meeting Agenda : In the first meeting agenda, the path to be followed on the project was determined together with the group members. Interdepartmental information was shared about the software and hardware of the project. The light patterns to be used in the project were determined. An estimated flow chart has been created.

Participants
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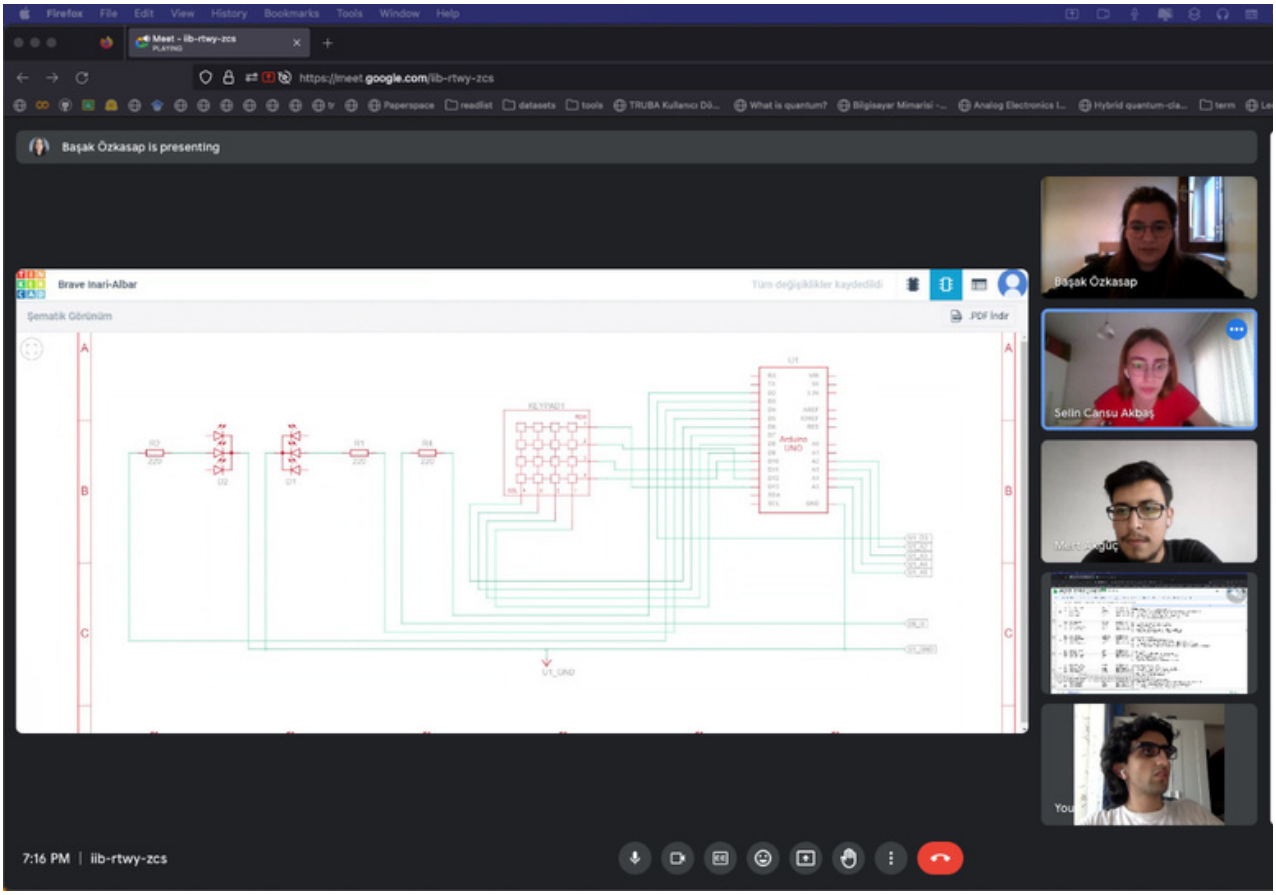

8. CONCLUSION

Meetings were conducted for a project aiming to create different shapes and patterns using values read from 4x4 keypads and 8-bit light patterns. In this project, specialized light sources, reflectors, lenses, or optical elements were utilized to control and direct the light. Light patterns find applications in various fields. As a result of the project, diverse shapes and patterns were generated by using values obtained from the 4x4 keypads and 8-bit light patterns.

The project team collaborated extensively during the development phase, engaging in brainstorming sessions and discussions to explore innovative approaches for creating captivating light patterns. They carefully analyzed the data acquired from the keypads and translated them into corresponding 8-bit binary light patterns, leveraging the versatility of the binary number system.

One of the main focuses of the project was to ensure seamless integration between the 4x4 keypads and the light control mechanisms.

In conclusion, the project's endeavors resulted in the creation of diverse shapes and patterns by utilizing values from 4x4 keypads and 8-bit light patterns.