GAZİ UNIVERSITY

FACULTY OF ENGINEERING

EEE306 / CENG318 - MICROPROCESSORS PROJECT

ELECTRICAL ELECTRONICS ENGINNERING - COMPUTER ENGINEERING DEPARTMENTS

INTERDISCIPLINARY WORK REPORT

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CONTENTS

1. INTRODUCTION

Our task in this section is to run software on hardware. The software studies conducted for running the code on the hardware are crucial. These studies take into account the hardware requirements and limitations to ensure that the software runs correctly. Running the software on the hardware is a significant stage in the software development process. This stage ensures that the software operates correctly under real-world conditions and provides a reliable experience for end-users. Running software on hardware may involve a number of steps. First of all, we have already determined the necessary hardware requirements in order to ensure software and hardware compatibility in our previous studies. The objective of this project is to run a software written in C language on hardware using Arduino. The project involves detecting and processing keyboard inputs and interacting with desired light patterns based on the keyboard inputs. We also wanted to add a flowchart to our work.

2. HARDWARE REQUIREMENTS

Since it would be more accurate to determine the hardware requirements necessary for compatibility between software and hardware, it is useful to specify the predetermined requirements again in this section.

- ARDUINO UNO
- ARDUINO BREADBOARD
- JUMPER WIRES
- 8 x 220 OHM RESISTANCE
- 8 x LED
- 4 x 4 KEYPAD
- AND ARDUNIO UNO IDE, WHICH IS IN THE FOREGROUND FOR THIS SECTION

3. RUNNING THE SOFTWARE ON THE HARDWARE

3.1. General Description

We chose a compatible platform so that the software can run on hardware. This platform provides us with a suitable environment for hardware and software to work together. We use the Arduino IDE (Integrated Development Environment) to upload the code written in C language for the project to the Arduino board. We connected the Arduino board to the computer. We ensured that the correct Arduino board are selected in the Arduino IDE. Then we uploaded the software. The Arduino IDE compiled the project, performed the necessary operations, and upload it to the Arduino board. Once the software uploaded to the Arduino board, it started to run on the hardware.

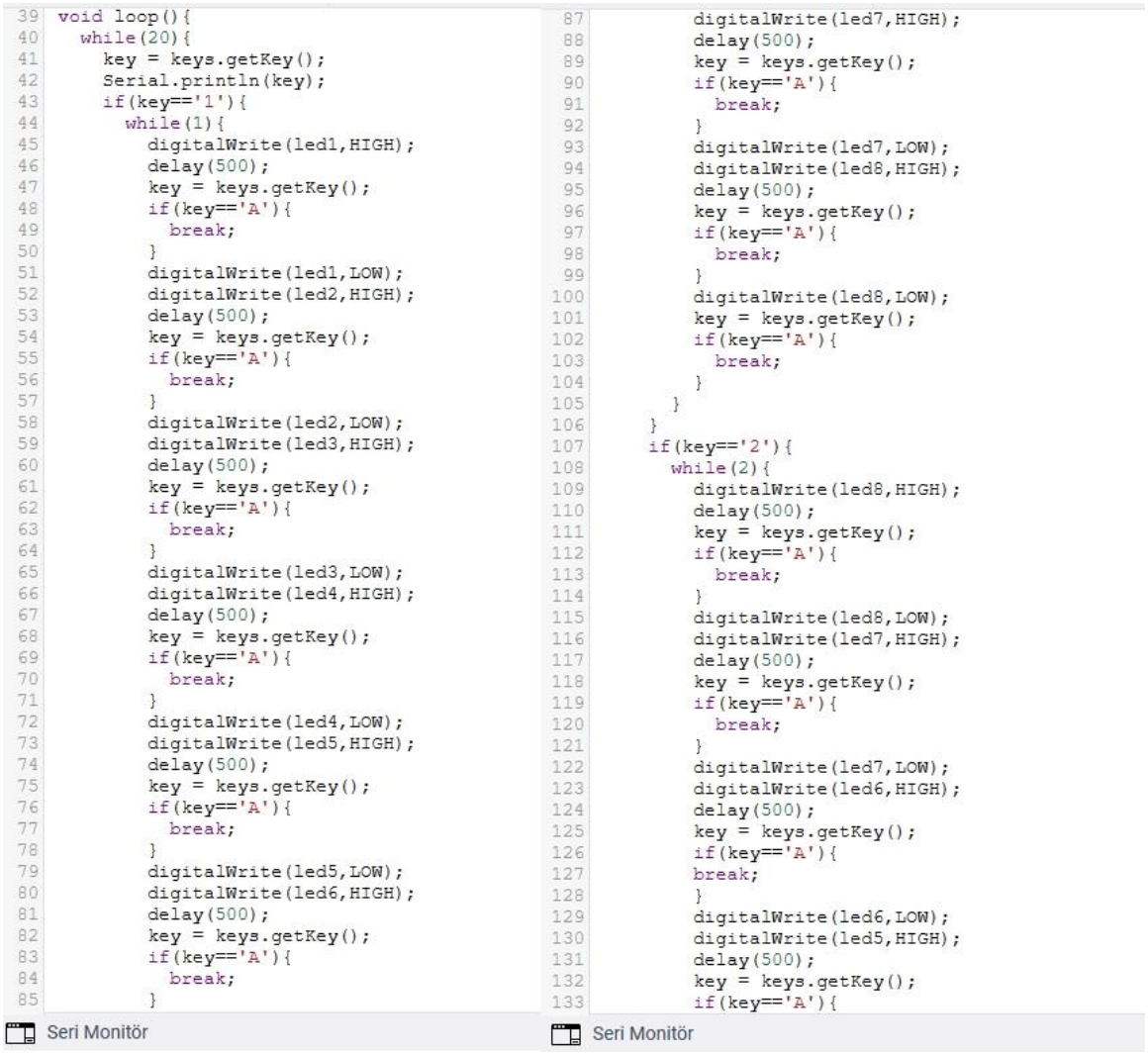
3.2. Code Explanation

We would like to provide explanations for the software's code. The code written is our Arduino sketch that uses a 4x4 keypad to control a set of LEDs. Here's a breakdown of how the code works:

```
#include <Keypad.h>
char  key;
const byte rows=4;
const byte coloums=4;

int led1=2;
int led2=3;
int led3=4;
int led4=5;
int led5=A0;
int led6=A1;
int led7=A2;
int led8=A3;

char keypad[rows][coloums]=
{
  {'1','2','3','A'},
  {'4','5','6','B'},
  {'7','8','9','C'},
  {'*','0','#','D'}
};

byte rowsPin[rows]={13,12,11,10};
byte coloumsPin[coloums]={9,8,7,6};

Keypad keys = Keypad(makeKeymap(keypad),rowsPin,coloumsPin,rows,coloums);

void setup(){
  Serial.begin(9600);
  pinMode(led1,OUTPUT);
  pinMode(led2,OUTPUT);
  pinMode(led3,OUTPUT);
  pinMode(led4,OUTPUT);
  pinMode(led5,OUTPUT);
  pinMode(led6,OUTPUT);
  pinMode(led7,OUTPUT);
  pinMode(led8,OUTPUT);
}
```

- The code includes the Keypad library, which provides functionality for interfacing with the keypad.

- The key variable is declared as a character to store the pressed key.
- Eight LED pins (led1 to led8) are defined and assigned to specific Arduino pins.
- Two arrays, rowsPin and columnsPin, are defined to store the Arduino pins connected to the rows and columns of the keypad.
- In the setup function, the serial communication is initialized, and all LED pins are set as output pins.



```
void loop(){
  while(20){
    key = keys.getKey();
    Serial.println(key);
    if(key=='1'){
      while(1){
        digitalWrite(led1,HIGH);
        delay(500);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led1,LOW);
        digitalWrite(led2,HIGH);
        delay(500);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led2,LOW);
        digitalWrite(led3,HIGH);
        delay(500);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led3,LOW);
        digitalWrite(led4,HIGH);
        delay(500);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led4,LOW);
        digitalWrite(led5,HIGH);
        delay(500);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led5,LOW);
        digitalWrite(led6,HIGH);
        delay(500);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led7,HIGH);
        delay(500);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led7,LOW);
        digitalWrite(led8,HIGH);
        delay(500);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led8,LOW);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
      }
    }
    if(key=='2'){
      while(2){
        digitalWrite(led8,HIGH);
        delay(500);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led8,LOW);
        digitalWrite(led7,HIGH);
        delay(500);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led7,LOW);
        digitalWrite(led6,HIGH);
        delay(500);
        key = keys.getKey();
        if(key=='A'){
        break;
        }
        digitalWrite(led6,LOW);
        digitalWrite(led5,HIGH);
        delay(500);
        key = keys.getKey();
        if(key=='A'){
```

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- The loop function is where the main logic of the code resides.
- The while loop runs indefinitely, waiting for a key to be pressed.
- When a key is pressed, its value is stored in the key variable and printed to the serial monitor.

- The code then checks which key was pressed using a series of if statements.
- For each key, there is a corresponding block of code that controls the LEDs based on the key press.
- For example, If the key is '1', enter a loop that cycles through the LEDs from led1 to led8, turning them on one at a time for 500 milliseconds. Pressing 'A' breaks the loop and returns to the keypad input.

```
        break;
      }
      digitalWrite(led5,LOW);
      digitalWrite(led4,HIGH);
      delay(500);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
      digitalWrite(led4,LOW);
      digitalWrite(led3,HIGH);
      delay(500);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
      digitalWrite(led3,LOW);
      digitalWrite(led2,HIGH);
      delay(500);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
      digitalWrite(led2,LOW);
      digitalWrite(led1,HIGH);
      delay(500);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
      digitalWrite(led1,LOW);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
    }
  }
  if(key=='3'){
    while(3){
      digitalWrite(led1,HIGH);
      digitalWrite(led2,HIGH);
      digitalWrite(led3,HIGH);
      digitalWrite(led4,HIGH);
      digitalWrite(led5,HIGH);
      digitalWrite(led6,HIGH);
      digitalWrite(led7,HIGH);
      digitalWrite(led8,LOW);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
      delay(500);

      digitalWrite(led8,HIGH);
      digitalWrite(led7,LOW);
      delay(500);
      key = keys.getKey();
      if(key=='A'){
        break;
      }

      digitalWrite(led7,HIGH);
      digitalWrite(led6,LOW);
      delay(500);
      key = keys.getKey();
      if(key=='A'){
        break;
      }

      digitalWrite(led6,HIGH);
      digitalWrite(led5,LOW);
      delay(500);
      key = keys.getKey();
      if(key=='A'){
        break;
      }

      digitalWrite(led5,HIGH);
      digitalWrite(led4,LOW);
      delay(500);
      key = keys.getKey();
      if(key=='A'){
        break;
      }

      digitalWrite(led4,HIGH);
      digitalWrite(led3,LOW);
      delay(500);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
```

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```
        digitalWrite(led3,HIGH);
        digitalWrite(led2,LOW);
        delay(500);
        key = keys.getKey();
        if(key=='A'){
          break;
        }

        digitalWrite(led2,HIGH);
        digitalWrite(led1,LOW);
        delay(500);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
      }
    }
    if(key=='4'){
      while(4){
        digitalWrite(led1,LOW);
        digitalWrite(led2,HIGH);
        digitalWrite(led3,HIGH);
        digitalWrite(led4,HIGH);
        digitalWrite(led5,HIGH);
        digitalWrite(led6,HIGH);
        digitalWrite(led7,HIGH);
        digitalWrite(led8,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        delay(500);

        digitalWrite(led1,HIGH);
        digitalWrite(led2,LOW);
        delay(500);
        key = keys.getKey();
        if(key=='A'){
          break;
        }

        digitalWrite(led2,HIGH);
        digitalWrite(led3,LOW);
        delay(500);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
```

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```
        }

        digitalWrite(led3,HIGH);
        digitalWrite(led4,LOW);
        delay(500);
        key = keys.getKey();
        if(key=='A'){
          break;
        }

        digitalWrite(led4,HIGH);
        digitalWrite(led5,LOW);
        delay(500);
        key = keys.getKey();
        if(key=='A'){
          break;
        }

        digitalWrite(led5,HIGH);
        digitalWrite(led6,LOW);
        delay(500);
        key = keys.getKey();
        if(key=='A'){
          break;
        }

        digitalWrite(led6,HIGH);
        digitalWrite(led7,LOW);
        delay(500);
        key = keys.getKey();
        if(key=='A'){
          break;
        }

        digitalWrite(led7,HIGH);
        digitalWrite(led8,LOW);
        delay(500);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
      }
    }
    if(key=='5'){
      while(5){
        digitalWrite(led1,HIGH);
```

```
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        delay(500);
        digitalWrite(led2,HIGH);
        key = keys.getKey();
        if(key=='A'){
         break;
        }
        delay(500);
        digitalWrite(led3,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        delay(500);
        digitalWrite(led4,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        delay(500);
        digitalWrite(led5,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        delay(500);
        digitalWrite(led6,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        delay(500);
        digitalWrite(led7,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        delay(500);
        digitalWrite(led8,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        delay(500);
```

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```
        digitalWrite(led1,LOW);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led2,LOW);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led3,LOW);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led4,LOW);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led5,LOW);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led6,LOW);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led7,LOW);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led8,LOW);
       key = keys.getKey();
        if(key=='A'){
          break;
        }
        delay(500);
      }
    }
    if(key=='6'){
      while(6){
        digitalWrite(led8,HIGH);
```

```
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        delay(500);
        digitalWrite(led7,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        delay(500);
        digitalWrite(led6,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        delay(500);
        digitalWrite(led5,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        delay(500);
        digitalWrite(led4,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        delay(500);
        digitalWrite(led3,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        delay(500);
        digitalWrite(led2,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        delay(500);
        digitalWrite(led1,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        delay(500);
```

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```
      digitalWrite(led1,LOW);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
      digitalWrite(led2,LOW);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
      digitalWrite(led3,LOW);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
      digitalWrite(led4,LOW);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
      digitalWrite(led5,LOW);
      key = keys.getKey();
      if(key=='A'){
       break;
      }
      digitalWrite(led6,LOW);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
      digitalWrite(led7,LOW);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
      digitalWrite(led8,LOW);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
      delay(500);
    }
  }
  if(key=='7'){
    while(7){
      digitalWrite(led4,HIGH);
```

```
        digitalWrite(led5,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
       }
      delay(500);

       digitalWrite(led6,HIGH);
       digitalWrite(led3,HIGH);
       key = keys.getKey();
       if(key=='A'){
         break;
       }
       delay(500);

       digitalWrite(led7,HIGH);
       digitalWrite(led2,HIGH);
       key = keys.getKey();
       if(key=='A'){
         break;
       }
       delay(500);

       digitalWrite(led8,HIGH);
       digitalWrite(led1,HIGH);
       key = keys.getKey();
       if(key=='A'){
         break;
       }
       delay(500);

       digitalWrite(led4,LOW);
       digitalWrite(led5,LOW);
       key = keys.getKey();
       if(key=='A'){
         break;
       }
       delay(500);

       digitalWrite(led6,LOW);
       digitalWrite(led3,LOW);
       key = keys.getKey();
       if(key=='A'){
         break;
       }
       delay(500);
```

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```
       digitalWrite(led7,LOW);
       digitalWrite(led2,LOW);
       key = keys.getKey();
       if(key=='A'){
         break;
       }
       delay(500);

       digitalWrite(led8,LOW);
       key = keys.getKey();
       if(key=='A'){
         break;
       }
       digitalWrite(led1,LOW);
       key = keys.getKey();
       if(key=='A'){
         break;
       }
       delay(500);
     }
   }
   if(key=='8'){
     while(8){
       digitalWrite(led1,HIGH);
       digitalWrite(led8,HIGH);
       key = keys.getKey();
       if(key=='A'){
         break;
       }
       delay(500);
       digitalWrite(led2,HIGH);
       digitalWrite(led7,HIGH);
       key = keys.getKey();
       if(key=='A'){
         break;
       }
       delay(500);
       digitalWrite(led3,HIGH);
       digitalWrite(led6,HIGH);
       key = keys.getKey();
       if(key=='A'){
         break;
       }
       delay(500);
       digitalWrite(led4,HIGH);
       digitalWrite(led5,HIGH);
```

```
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        delay(500);
        digitalWrite(led8,LOW);
        digitalWrite(led1,LOW);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        delay(500);
        digitalWrite(led7,LOW);
        digitalWrite(led2,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        delay(500);

        digitalWrite(led6,LOW);
        digitalWrite(led3,LOW);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        delay(500);

        digitalWrite(led4,LOW);
        digitalWrite(led5,LOW);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        delay(500);
      }
    }
    if(key=='9'){
      while(9){
        digitalWrite(led1,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        delay(500);
        digitalWrite(led3,HIGH);
        key = keys.getKey();
```

```
      if(key=='A'){
        break;
      }
      delay(500);
      digitalWrite(led5,HIGH);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
      delay(500);
      digitalWrite(led7,HIGH);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
      delay(500);
      digitalWrite(led1,LOW);
      digitalWrite(led3,LOW);
      digitalWrite(led5,LOW);
      digitalWrite(led7,LOW);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
      digitalWrite(led8,HIGH);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
      delay(500);
      digitalWrite(led6,HIGH);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
      delay(500);
      digitalWrite(led4,HIGH);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
      delay(500);
      digitalWrite(led2,HIGH);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
```

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```
      delay(500);
      digitalWrite(led2,LOW);
      digitalWrite(led4,LOW);
      digitalWrite(led6,LOW);
      digitalWrite(led8,LOW);
      digitalWrite(led4,HIGH);
      key = keys.getKey();
      if(key=='A'){
       break;
      }
      delay(500);
      digitalWrite(led6,HIGH);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
      delay(500);
      digitalWrite(led8,HIGH);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
      delay(500);
      digitalWrite(led2,LOW);
      digitalWrite(led4,LOW);
      digitalWrite(led6,LOW);
      digitalWrite(led8,LOW);
      key = keys.getKey();
      if(key=='A'){
         break;
      }
      digitalWrite(led1,HIGH);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
      delay(500);
      digitalWrite(led3,HIGH);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
      delay(500);
      digitalWrite(led5,HIGH);
      key = keys.getKey();
      if(key=='A'){
```

```
        break;
      }
      delay(500);
      digitalWrite(led7,HIGH);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
      delay(500);
      digitalWrite(led1,LOW);
      digitalWrite(led3,LOW);
      digitalWrite(led5,LOW);
      digitalWrite(led7,LOW)
    }
  }
  if(key=='A'){
    while(11){
      digitalWrite(led1,LOW);
      digitalWrite(led2,LOW);
      digitalWrite(led3,LOW);
      digitalWrite(led4,LOW);
      digitalWrite(led5,LOW);
      digitalWrite(led6,LOW);
      digitalWrite(led7,LOW);
      digitalWrite(led8,LOW);
    }
  }
  if(key=='B'){
    while(12){
      digitalWrite(led1,HIGH);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
      digitalWrite(led2,HIGH);
      key = keys.getKey();
      if(key=='A'){
        break;
      }
      digitalWrite(led3,HIGH);
      key = keys.getKey();
      if(key=='A'){
       break;
      }
      digitalWrite(led4,HIGH);
      key = keys.getKey();
      if(key=='A'){
```

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```
          break;
        }
        digitalWrite(led5,HIGH);
        key = keys.getKey();
        if(key=='A'){
         break;
        }
        digitalWrite(led6,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led7,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led8,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
      }
    }
    if(key=='C'){
      while(13){
        digitalWrite(led1,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led2,LOW);
        digitalWrite(led3,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led4,LOW);
        digitalWrite(led5,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led6,LOW);
        digitalWrite(led7,HIGH);
        key = keys.getKey();
```

```
        if(key=='A'){
          break;
        }
        digitalWrite(led8,LOW);
        key = keys.getKey();
        if(key=='A'){
         break;
        }
      }
    }
    if(key=='D'){
      while(14){
        digitalWrite(led1,LOW);
        digitalWrite(led2,HIGH);
        key = keys.getKey();
        if(key=='A'){
         break;
        }
        digitalWrite(led3,LOW);
        digitalWrite(led4,HIGH);
        key = keys.getKey();
        if(key=='A'){
         break;
        }
        digitalWrite(led5,LOW);
        digitalWrite(led6,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led7,LOW);
        digitalWrite(led8,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
      }
    }
    if(key=='*'){
      while(15){
        digitalWrite(led2,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led4,HIGH);
        key = keys.getKey();
```

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```
        if(key=='A'){
          break;
        }
        digitalWrite(led6,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led8,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        delay(500);
        digitalWrite(led2,LOW);
        digitalWrite(led4,LOW);
        digitalWrite(led6,LOW);
        digitalWrite(led8,LOW);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led1,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led3,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led5,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led7,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        delay(500);
        digitalWrite(led1,LOW);
        digitalWrite(led3,LOW);
        digitalWrite(led5,LOW);
        digitalWrite(led7,LOW);
```

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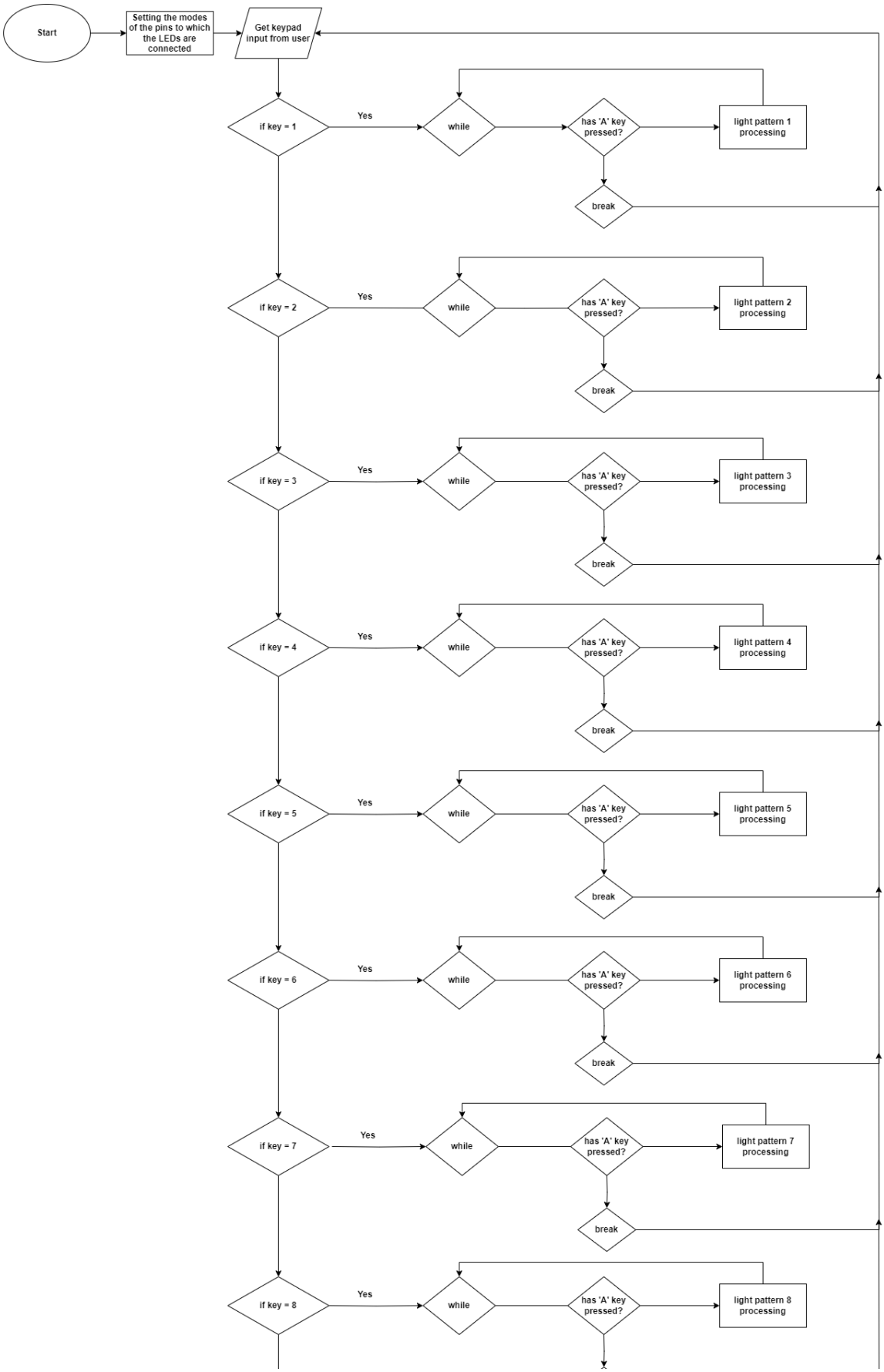
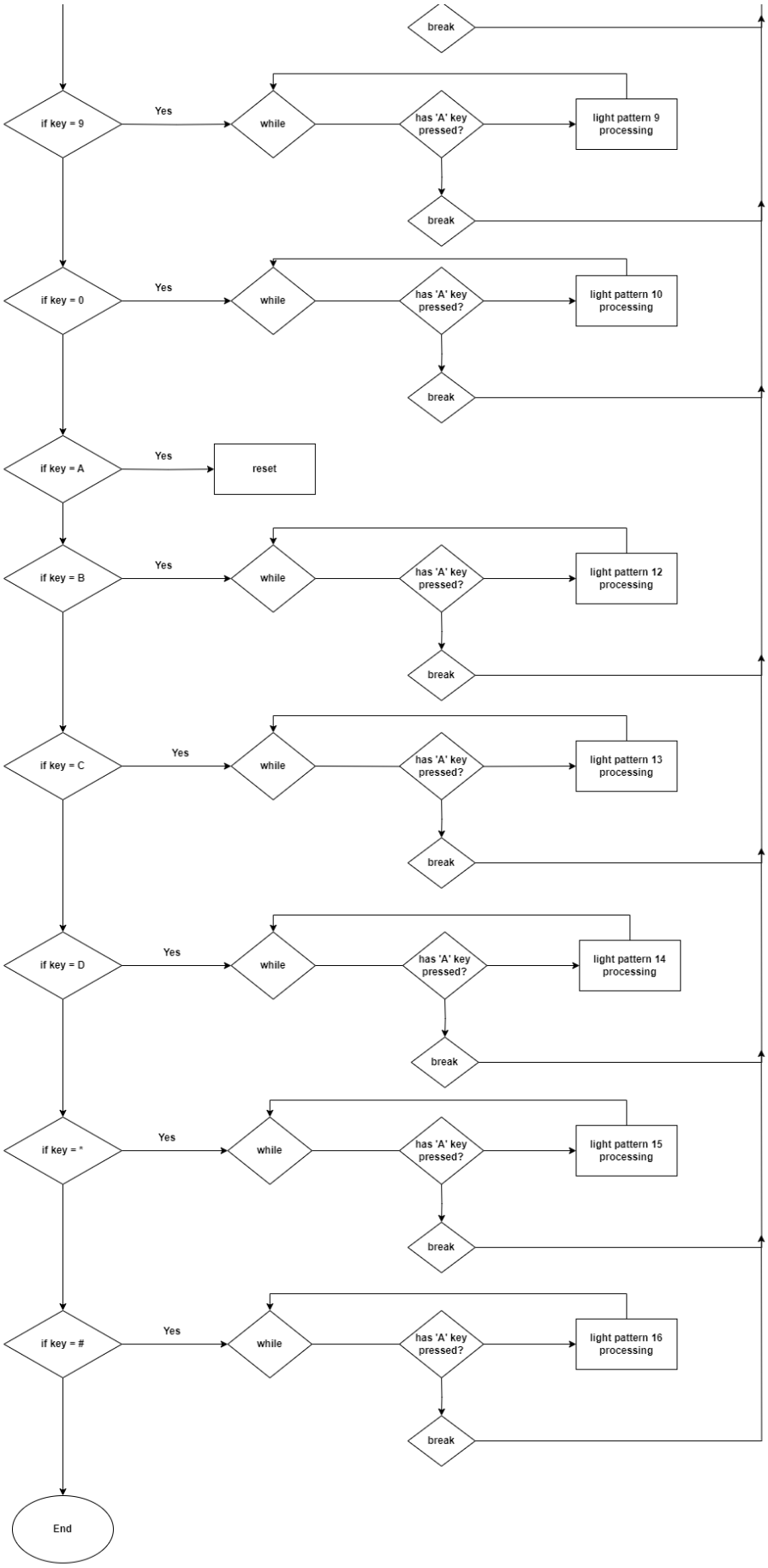
```
        key = keys.getKey();
        if(key=='A'){
          break;
        }
      }
    }
    if(key=='#'){
      while(16){
        digitalWrite(led1,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led3,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led5,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led7,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        delay(500);
        digitalWrite(led1,LOW);
        digitalWrite(led3,LOW);
        digitalWrite(led5,LOW);
        digitalWrite(led7,LOW);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led2,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
        }
        digitalWrite(led4,HIGH);
        key = keys.getKey();
        if(key=='A'){
          break;
```

- The code follows a similar pattern for keys '2', '3', '4', '5', '6', '7', and '8', but with different light patterns.
- The code uses the delay function to create delays between LED changes. It continuously checks for key presses and performs the corresponding actions based on the key value.

Overall, the code allows the user to control the LEDs by pressing different keys on the keypad. The behavior of the LEDs depends on the key pressed and can include different sequences and patterns.

4. FLOWCHART


Start
Setting the modes of the pins to which the LEDs are connected
Get keypad input from user
if key = 1
Yes
while
has 'A' key pressed?
light pattern 1 processing
break
if key = 2
Yes
while
has 'A' key pressed?
light pattern 2 processing
break
if key = 3
Yes
while
has 'A' key pressed?
light pattern 3 processing
break
if key = 4
Yes
while
has 'A' key pressed?
light pattern 4 processing
break
if key = 5
Yes
while
has 'A' key pressed?
light pattern 5 processing
break
if key = 6
Yes
while
has 'A' key pressed?
light pattern 6 processing
break
if key = 7
Yes
while
has 'A' key pressed?
light pattern 7 processing
break
if key = 8
Yes
while
has 'A' key pressed?
light pattern 8 processing


break
if key = 9
Yes
while
has 'A' key pressed?
light pattern 9 processing
break
if key = 0
Yes
while
has 'A' key pressed?
light pattern 10 processing
break
if key = A
Yes
reset
if key = B
Yes
while
has 'A' key pressed?
light pattern 12 processing
break
if key = C
Yes
while
has 'A' key pressed?
light pattern 13 processing
break
if key = D
Yes
while
has 'A' key pressed?
light pattern 14 processing
break
if key = *
Yes
while
has 'A' key pressed?
light pattern 15 processing
break
if key = #
Yes
while
has 'A' key pressed?
light pattern 16 processing
break
End

5. INTERDISCIPLINARY WORK MEETING

3rd Meeting of The Project

Project Topic: Different Light Pattern

Meeting Date: 28.05.2023

Meeting Agenda: On the agenda of the third meeting, conversations were made with the group members about connecting and running the software to the hardware and lighting the light patterns by interacting with the keyboard inputs. We created a roadmap for planning our progress and allocating responsibilities. Afterwards, we carried out our work as stated in the report.

Participants

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