



**GAZİ UNIVERSITY**  
**FACULTY OF ENGINEERING**

**EEE306 / CENG318 - MICROPROCESSORS PROJECT**

**ELECTRICAL ELECTRONICS ENGINEERING - COMPUTER ENGINEERING**  
**DEPARTMENTS**

**INTERDISCIPLINARY WORK REPORT**

**181110059 Fatma Başak ÖZKASAP**

**191180005 Selin Cansu AKBAŞ**

**191180006 Mert AKGÜÇ**

**C191130040 Metehan ERKAN**

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## **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:

```


1  #include <Keypad.h>
2  char key;
3  const byte rows=4;
4  const byte coloums=4;
5
6  int led1=2;
7  int led2=3;
8  int led3=4;
9  int led4=5;
10 int led5=A0;
11 int led6=A1;
12 int led7=A2;
13 int led8=A3;
14
15 char keypad[rows][coloums]=
16 {
17   {'1','2','3','A'},
18   {'4','5','6','B'},
19   {'7','8','9','C'},
20   {'*','0','#','D'}
21 };
22
23 byte rowsPin[rows]={13,12,11,10};
24 byte coloumsPin[coloums]={9,8,7,6};
25
26 Keypad keys = Keypad(makeKeymap(keypad), rowsPin, coloumsPin, rows, coloums);
27
28 void setup(){
29   Serial.begin(9600);
30   pinMode(led1,OUTPUT);
31   pinMode(led2,OUTPUT);
32   pinMode(led3,OUTPUT);
33   pinMode(led4,OUTPUT);
34   pinMode(led5,OUTPUT);
35   pinMode(led6,OUTPUT);
36   pinMode(led7,OUTPUT);
37   pinMode(led8,OUTPUT);
38 }


```

- 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.

<pre> 39 void loop() { 40   while(20) { 41     key = keys.getKey(); 42     Serial.println(key); 43     if(key=='1') { 44       while(1) { 45         digitalWrite(led1,HIGH); 46         delay(500); 47         key = keys.getKey(); 48         if(key=='A') { 49           break; 50         } 51         digitalWrite(led1,LOW); 52         digitalWrite(led2,HIGH); 53         delay(500); 54         key = keys.getKey(); 55         if(key=='A') { 56           break; 57         } 58         digitalWrite(led2,LOW); 59         digitalWrite(led3,HIGH); 60         delay(500); 61         key = keys.getKey(); 62         if(key=='A') { 63           break; 64         } 65         digitalWrite(led3,LOW); 66         digitalWrite(led4,HIGH); 67         delay(500); 68         key = keys.getKey(); 69         if(key=='A') { 70           break; 71         } 72         digitalWrite(led4,LOW); 73         digitalWrite(led5,HIGH); 74         delay(500); 75         key = keys.getKey(); 76         if(key=='A') { 77           break; 78         } 79         digitalWrite(led5,LOW); 80         digitalWrite(led6,HIGH); 81         delay(500); 82         key = keys.getKey(); 83         if(key=='A') { 84           break; 85         } </pre>	<pre> 87         digitalWrite(led7,HIGH); 88         delay(500); 89         key = keys.getKey(); 90         if(key=='A') { 91           break; 92         } 93         digitalWrite(led7,LOW); 94         digitalWrite(led8,HIGH); 95         delay(500); 96         key = keys.getKey(); 97         if(key=='A') { 98           break; 99         } 100        digitalWrite(led8,LOW); 101        key = keys.getKey(); 102        if(key=='A') { 103          break; 104        } 105      } 106    } 107    if(key=='2') { 108      while(2) { 109        digitalWrite(led8,HIGH); 110        delay(500); 111        key = keys.getKey(); 112        if(key=='A') { 113          break; 114        } 115        digitalWrite(led8,LOW); 116        digitalWrite(led7,HIGH); 117        delay(500); 118        key = keys.getKey(); 119        if(key=='A') { 120          break; 121        } 122        digitalWrite(led7,LOW); 123        digitalWrite(led6,HIGH); 124        delay(500); 125        key = keys.getKey(); 126        if(key=='A') { 127          break; 128        } 129        digitalWrite(led6,LOW); 130        digitalWrite(led5,HIGH); 131        delay(500); 132        key = keys.getKey(); 133        if(key=='A') { </pre>
---	---

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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.

```

134         break;
135     }
136     digitalWrite(led5, LOW);
137     digitalWrite(led4, HIGH);
138     delay(500);
139     key = keys.getKey();
140     if(key=='A'){
141         break;
142     }
143     digitalWrite(led4, LOW);
144     digitalWrite(led3, HIGH);
145     delay(500);
146     key = keys.getKey();
147     if(key=='A'){
148         break;
149     }
150     digitalWrite(led3, LOW);
151     digitalWrite(led2, HIGH);
152     delay(500);
153     key = keys.getKey();
154     if(key=='A'){
155         break;
156     }
157     digitalWrite(led2, LOW);
158     digitalWrite(led1, HIGH);
159     delay(500);
160     key = keys.getKey();
161     if(key=='A'){
162         break;
163     }
164     digitalWrite(led1, LOW);
165     key = keys.getKey();
166     if(key=='A'){
167         break;
168     }
169 }
170 }
171 if(key=='3'){
172     while(3){
173         digitalWrite(led1, HIGH);
174         digitalWrite(led2, HIGH);
175         digitalWrite(led3, HIGH);
176         digitalWrite(led4, HIGH);
177         digitalWrite(led5, HIGH);
178         digitalWrite(led6, HIGH);
179         digitalWrite(led7, HIGH);

```

```

180         digitalWrite(led8, LOW);
181         key = keys.getKey();
182         if(key=='A'){
183             break;
184         }
185         delay(500);
186
187         digitalWrite(led8, HIGH);
188         digitalWrite(led7, LOW);
189         delay(500);
190         key = keys.getKey();
191         if(key=='A'){
192             break;
193         }
194
195         digitalWrite(led7, HIGH);
196         digitalWrite(led6, LOW);
197         delay(500);
198         key = keys.getKey();
199         if(key=='A'){
200             break;
201         }
202
203         digitalWrite(led6, HIGH);
204         digitalWrite(led5, LOW);
205         delay(500);
206         key = keys.getKey();
207         if(key=='A'){
208             break;
209         }
210
211         digitalWrite(led5, HIGH);
212         digitalWrite(led4, LOW);
213         delay(500);
214         key = keys.getKey();
215         if(key=='A'){
216             break;
217         }
218
219         digitalWrite(led4, HIGH);
220         digitalWrite(led3, LOW);
221         delay(500);
222         key = keys.getKey();
223         if(key=='A'){
224             break;
225         }

```

```

227     digitalWrite(led3,HIGH);
228     digitalWrite(led2,LOW);
229     delay(500);
230     key = keys.getKey();
231     if(key=='A'){
232         break;
233     }
234
235     digitalWrite(led2,HIGH);
236     digitalWrite(led1,LOW);
237     delay(500);
238     key = keys.getKey();
239     if(key=='A'){
240         break;
241     }
242 }
243 }
244 if(key=='4'){
245     while(4){
246         digitalWrite(led1,LOW);
247         digitalWrite(led2,HIGH);
248         digitalWrite(led3,HIGH);
249         digitalWrite(led4,HIGH);
250         digitalWrite(led5,HIGH);
251         digitalWrite(led6,HIGH);
252         digitalWrite(led7,HIGH);
253         digitalWrite(led8,HIGH);
254         key = keys.getKey();
255         if(key=='A'){
256             break;
257         }
258         delay(500);
259
260         digitalWrite(led1,HIGH);
261         digitalWrite(led2,LOW);
262         delay(500);
263         key = keys.getKey();
264         if(key=='A'){
265             break;
266         }
267
268         digitalWrite(led2,HIGH);
269         digitalWrite(led3,LOW);
270         delay(500);
271         key = keys.getKey();
272         if(key=='A'){
273             break;
274
275     }
276     digitalWrite(led3,HIGH);
277     digitalWrite(led4,LOW);
278     delay(500);
279     key = keys.getKey();
280     if(key=='A'){
281         break;
282     }
283
284     digitalWrite(led4,HIGH);
285     digitalWrite(led5,LOW);
286     delay(500);
287     key = keys.getKey();
288     if(key=='A'){
289         break;
290     }
291
292     digitalWrite(led5,HIGH);
293     digitalWrite(led6,LOW);
294     delay(500);
295     key = keys.getKey();
296     if(key=='A'){
297         break;
298     }
299
300     digitalWrite(led6,HIGH);
301     digitalWrite(led7,LOW);
302     delay(500);
303     key = keys.getKey();
304     if(key=='A'){
305         break;
306     }
307
308     digitalWrite(led7,HIGH);
309     digitalWrite(led8,LOW);
310     delay(500);
311     key = keys.getKey();
312     if(key=='A'){
313         break;
314     }
315 }
316 }
317 if(key=='5'){
318     while(5){
319         digitalWrite(led1,HIGH);

```

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```

320     key = keys.getKey();
321     if(key=='A'){
322         break;
323     }
324     delay(500);
325     digitalWrite(led2,HIGH);
326     key = keys.getKey();
327     if(key=='A'){
328         break;
329     }
330     delay(500);
331     digitalWrite(led3,HIGH);
332     key = keys.getKey();
333     if(key=='A'){
334         break;
335     }
336     delay(500);
337     digitalWrite(led4,HIGH);
338     key = keys.getKey();
339     if(key=='A'){
340         break;
341     }
342     delay(500);
343     digitalWrite(led5,HIGH);
344     key = keys.getKey();
345     if(key=='A'){
346         break;
347     }
348     delay(500);
349     digitalWrite(led6,HIGH);
350     key = keys.getKey();
351     if(key=='A'){
352         break;
353     }
354     delay(500);
355     digitalWrite(led7,HIGH);
356     key = keys.getKey();
357     if(key=='A'){
358         break;
359     }
360     delay(500);
361     digitalWrite(led8,HIGH);
362     key = keys.getKey();
363     if(key=='A'){
364         break;
365     }
366     delay(500);
367
368     digitalWrite(led1,LOW);
369     key = keys.getKey();
370     if(key=='A'){
371         break;
372     }
373     digitalWrite(led2,LOW);
374     key = keys.getKey();
375     if(key=='A'){
376         break;
377     }
378     digitalWrite(led3,LOW);
379     key = keys.getKey();
380     if(key=='A'){
381         break;
382     }
383     digitalWrite(led4,LOW);
384     key = keys.getKey();
385     if(key=='A'){
386         break;
387     }
388     digitalWrite(led5,LOW);
389     key = keys.getKey();
390     if(key=='A'){
391         break;
392     }
393     digitalWrite(led6,LOW);
394     key = keys.getKey();
395     if(key=='A'){
396         break;
397     }
398     digitalWrite(led7,LOW);
399     key = keys.getKey();
400     if(key=='A'){
401         break;
402     }
403     digitalWrite(led8,LOW);
404     key = keys.getKey();
405     if(key=='A'){
406         break;
407     }
408     delay(500);
409 }
410 if(key=='6'){
411     while(6){
412         digitalWrite(led8,HIGH);

```


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```

413     key = keys.getKey();
414     if(key=='A'){
415         break;
416     }
417     delay(500);
418     digitalWrite(led7,HIGH);
419     key = keys.getKey();
420     if(key=='A'){
421         break;
422     }
423     delay(500);
424     digitalWrite(led6,HIGH);
425     key = keys.getKey();
426     if(key=='A'){
427         break;
428     }
429     delay(500);
430     digitalWrite(led5,HIGH);
431     key = keys.getKey();
432     if(key=='A'){
433         break;
434     }
435     delay(500);
436     digitalWrite(led4,HIGH);
437     key = keys.getKey();
438     if(key=='A'){
439         break;
440     }
441     delay(500);
442     digitalWrite(led3,HIGH);
443     key = keys.getKey();
444     if(key=='A'){
445         break;
446     }
447     delay(500);
448     digitalWrite(led2,HIGH);
449     key = keys.getKey();
450     if(key=='A'){
451         break;
452     }
453     delay(500);
454     digitalWrite(led1,HIGH);
455     key = keys.getKey();
456     if(key=='A'){
457         break;
458     }
459     delay(500);
460
461     digitalWrite(led1,LOW);
462     key = keys.getKey();
463     if(key=='A'){
464         break;
465     }
466     digitalWrite(led2,LOW);
467     key = keys.getKey();
468     if(key=='A'){
469         break;
470     }
471     digitalWrite(led3,LOW);
472     key = keys.getKey();
473     if(key=='A'){
474         break;
475     }
476     digitalWrite(led4,LOW);
477     key = keys.getKey();
478     if(key=='A'){
479         break;
480     }
481     digitalWrite(led5,LOW);
482     key = keys.getKey();
483     if(key=='A'){
484         break;
485     }
486     digitalWrite(led6,LOW);
487     key = keys.getKey();
488     if(key=='A'){
489         break;
490     }
491     digitalWrite(led7,LOW);
492     key = keys.getKey();
493     if(key=='A'){
494         break;
495     }
496     digitalWrite(led8,LOW);
497     key = keys.getKey();
498     if(key=='A'){
499         break;
500     }
501     delay(500);
502 }
503 if(key=='7'){
504     while(7){
505         digitalWrite(led4,HIGH);

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```

506     digitalWrite(led5,HIGH);
507     key = keys.getKey();
508     if(key=='A'){
509         break;
510     }
511     delay(500);
512
513     digitalWrite(led6,HIGH);
514     digitalWrite(led3,HIGH);
515     key = keys.getKey();
516     if(key=='A'){
517         break;
518     }
519     delay(500);
520
521     digitalWrite(led7,HIGH);
522     digitalWrite(led2,HIGH);
523     key = keys.getKey();
524     if(key=='A'){
525         break;
526     }
527     delay(500);
528
529     digitalWrite(led8,HIGH);
530     digitalWrite(led1,HIGH);
531     key = keys.getKey();
532     if(key=='A'){
533         break;
534     }
535     delay(500);
536
537     digitalWrite(led4,LOW);
538     digitalWrite(led5,LOW);
539     key = keys.getKey();
540     if(key=='A'){
541         break;
542     }
543     delay(500);
544
545     digitalWrite(led6,LOW);
546     digitalWrite(led3,LOW);
547     key = keys.getKey();
548     if(key=='A'){
549         break;
550     }
551     delay(500);
552
553     digitalWrite(led7,LOW);
554     digitalWrite(led2,LOW);
555     key = keys.getKey();
556     if(key=='A'){
557         break;
558     }
559     delay(500);
560
561     digitalWrite(led8,LOW);
562     key = keys.getKey();
563     if(key=='A'){
564         break;
565     }
566     digitalWrite(led1,LOW);
567     key = keys.getKey();
568     if(key=='A'){
569         break;
570     }
571     delay(500);
572 }
573
574 if(key=='8'){
575     while(8){
576         digitalWrite(led1,HIGH);
577         digitalWrite(led8,HIGH);
578         key = keys.getKey();
579         if(key=='A'){
580             break;
581         }
582         delay(500);
583         digitalWrite(led2,HIGH);
584         digitalWrite(led7,HIGH);
585         key = keys.getKey();
586         if(key=='A'){
587             break;
588         }
589         delay(500);
590         digitalWrite(led3,HIGH);
591         digitalWrite(led6,HIGH);
592         key = keys.getKey();
593         if(key=='A'){
594             break;
595         }
596         delay(500);
597         digitalWrite(led4,HIGH);
598         digitalWrite(led5,HIGH);

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```

599     key = keys.getKey();
600     if(key=='A'){
601         break;
602     }
603     delay(500);
604     digitalWrite(led8, LOW);
605     digitalWrite(led1, LOW);
606     key = keys.getKey();
607     if(key=='A'){
608         break;
609     }
610     delay(500);
611     digitalWrite(led7, LOW);
612     digitalWrite(led2, HIGH);
613     key = keys.getKey();
614     if(key=='A'){
615         break;
616     }
617     delay(500);
618
619     digitalWrite(led6, LOW);
620     digitalWrite(led3, LOW);
621     key = keys.getKey();
622     if(key=='A'){
623         break;
624     }
625     delay(500);
626
627     digitalWrite(led4, LOW);
628     digitalWrite(led5, LOW);
629     key = keys.getKey();
630     if(key=='A'){
631         break;
632     }
633     delay(500);
634 }
635
636 if(key=='9'){
637     while(9){
638         digitalWrite(led1, HIGH);
639         key = keys.getKey();
640         if(key=='A'){
641             break;
642         }
643         delay(500);
644         digitalWrite(led3, HIGH);
645         key = keys.getKey();

```

```

646     if(key=='A'){
647         break;
648     }
649     delay(500);
650     digitalWrite(led5, HIGH);
651     key = keys.getKey();
652     if(key=='A'){
653         break;
654     }
655     delay(500);
656     digitalWrite(led7, HIGH);
657     key = keys.getKey();
658     if(key=='A'){
659         break;
660     }
661     delay(500);
662     digitalWrite(led1, LOW);
663     digitalWrite(led3, LOW);
664     digitalWrite(led5, LOW);
665     digitalWrite(led7, LOW);
666     key = keys.getKey();
667     if(key=='A'){
668         break;
669     }
670     digitalWrite(led8, HIGH);
671     key = keys.getKey();
672     if(key=='A'){
673         break;
674     }
675     delay(500);
676     digitalWrite(led6, HIGH);
677     key = keys.getKey();
678     if(key=='A'){
679         break;
680     }
681     delay(500);
682     digitalWrite(led4, HIGH);
683     key = keys.getKey();
684     if(key=='A'){
685         break;
686     }
687     delay(500);
688     digitalWrite(led2, HIGH);
689     key = keys.getKey();
690     if(key=='A'){
691         break;
692     }

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```

693     delay(500);
694     digitalWrite(led2, LOW);
695     digitalWrite(led4, LOW);
696     digitalWrite(led6, LOW);
697     digitalWrite(led8, LOW);
698     digitalWrite(led4, HIGH);
699     key = keys.getKey();
700     if(key=='A'){
701         break;
702     }
703     delay(500);
704     digitalWrite(led6, HIGH);
705     key = keys.getKey();
706     if(key=='A'){
707         break;
708     }
709     delay(500);
710     digitalWrite(led8, HIGH);
711     key = keys.getKey();
712     if(key=='A'){
713         break;
714     }
715     delay(500);
716     digitalWrite(led2, LOW);
717     digitalWrite(led4, LOW);
718     digitalWrite(led6, LOW);
719     digitalWrite(led8, LOW);
720     key = keys.getKey();
721     if(key=='A'){
722         break;
723     }
724     digitalWrite(led1, HIGH);
725     key = keys.getKey();
726     if(key=='A'){
727         break;
728     }
729     delay(500);
730     digitalWrite(led3, HIGH);
731     key = keys.getKey();
732     if(key=='A'){
733         break;
734     }
735     delay(500);
736     digitalWrite(led5, HIGH);
737     key = keys.getKey();
738     if(key=='A'){

```

```

739         break;
740     }
741     delay(500);
742     digitalWrite(led7, HIGH);
743     key = keys.getKey();
744     if(key=='A'){
745         break;
746     }
747     delay(500);
748     digitalWrite(led1, LOW);
749     digitalWrite(led3, LOW);
750     digitalWrite(led5, LOW);
751     digitalWrite(led7, LOW);
752 }
753
754 if(key=='A'){
755     while(11){
756         digitalWrite(led1, LOW);
757         digitalWrite(led2, LOW);
758         digitalWrite(led3, LOW);
759         digitalWrite(led4, LOW);
760         digitalWrite(led5, LOW);
761         digitalWrite(led6, LOW);
762         digitalWrite(led7, LOW);
763         digitalWrite(led8, LOW);
764     }
765 }
766 if(key=='B'){
767     while(12){
768         digitalWrite(led1, HIGH);
769         key = keys.getKey();
770         if(key=='A'){
771             break;
772         }
773         digitalWrite(led2, HIGH);
774         key = keys.getKey();
775         if(key=='A'){
776             break;
777         }
778         digitalWrite(led3, HIGH);
779         key = keys.getKey();
780         if(key=='A'){
781             break;
782         }
783         digitalWrite(led4, HIGH);
784         key = keys.getKey();
785         if(key=='A'){

```

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```


786     break;
787 }
788 digitalWrite(led5,HIGH);
789 key = keys.getKey();
790 if(key=='A'){
791     break;
792 }
793 digitalWrite(led6,HIGH);
794 key = keys.getKey();
795 if(key=='A'){
796     break;
797 }
798 digitalWrite(led7,HIGH);
799 key = keys.getKey();
800 if(key=='A'){
801     break;
802 }
803 digitalWrite(led8,HIGH);
804 key = keys.getKey();
805 if(key=='A'){
806     break;
807 }
808 }
809 }
810 if(key=='C'){
811     while(13){
812         digitalWrite(led1,HIGH);
813         key = keys.getKey();
814         if(key=='A'){
815             break;
816         }
817         digitalWrite(led2,LOW);
818         digitalWrite(led3,HIGH);
819         key = keys.getKey();
820         if(key=='A'){
821             break;
822         }
823         digitalWrite(led4,LOW);
824         digitalWrite(led5,HIGH);
825         key = keys.getKey();
826         if(key=='A'){
827             break;
828         }
829         digitalWrite(led6,LOW);
830         digitalWrite(led7,HIGH);
831         key = keys.getKey();

```

```

832     if(key=='A'){
833         break;
834     }
835     digitalWrite(led8,LOW);
836     key = keys.getKey();
837     if(key=='A'){
838         break;
839     }
840 }
841 }
842 if(key=='D'){
843     while(14){
844         digitalWrite(led1,LOW);
845         digitalWrite(led2,HIGH);
846         key = keys.getKey();
847         if(key=='A'){
848             break;
849         }
850         digitalWrite(led3,LOW);
851         digitalWrite(led4,HIGH);
852         key = keys.getKey();
853         if(key=='A'){
854             break;
855         }
856         digitalWrite(led5,LOW);
857         digitalWrite(led6,HIGH);
858         key = keys.getKey();
859         if(key=='A'){
860             break;
861         }
862         digitalWrite(led7,LOW);
863         digitalWrite(led8,HIGH);
864         key = keys.getKey();
865         if(key=='A'){
866             break;
867         }
868     }
869 }
870 if(key=='*'){
871     while(15){
872         digitalWrite(led2,HIGH);
873         key = keys.getKey();
874         if(key=='A'){
875             break;
876         }
877         digitalWrite(led4,HIGH);
878         key = keys.getKey();

```

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```

879     if(key=='A'){
880         break;
881     }
882     digitalWrite(led6,HIGH);
883     key = keys.getKey();
884     if(key=='A'){
885         break;
886     }
887     digitalWrite(led8,HIGH);
888     key = keys.getKey();
889     if(key=='A'){
890         break;
891     }
892     delay(500);
893     digitalWrite(led2,LOW);
894     digitalWrite(led4,LOW);
895     digitalWrite(led6,LOW);
896     digitalWrite(led8,LOW);
897     key = keys.getKey();
898     if(key=='A'){
899         break;
900     }
901     digitalWrite(led1,HIGH);
902     key = keys.getKey();
903     if(key=='A'){
904         break;
905     }
906     digitalWrite(led3,HIGH);
907     key = keys.getKey();
908     if(key=='A'){
909         break;
910     }
911     digitalWrite(led5,HIGH);
912     key = keys.getKey();
913     if(key=='A'){
914         break;
915     }
916     digitalWrite(led7,HIGH);
917     key = keys.getKey();
918     if(key=='A'){
919         break;
920     }
921     delay(500);
922     digitalWrite(led1,LOW);
923     digitalWrite(led3,LOW);
924     digitalWrite(led5,LOW);
925     digitalWrite(led7,LOW);

```

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```

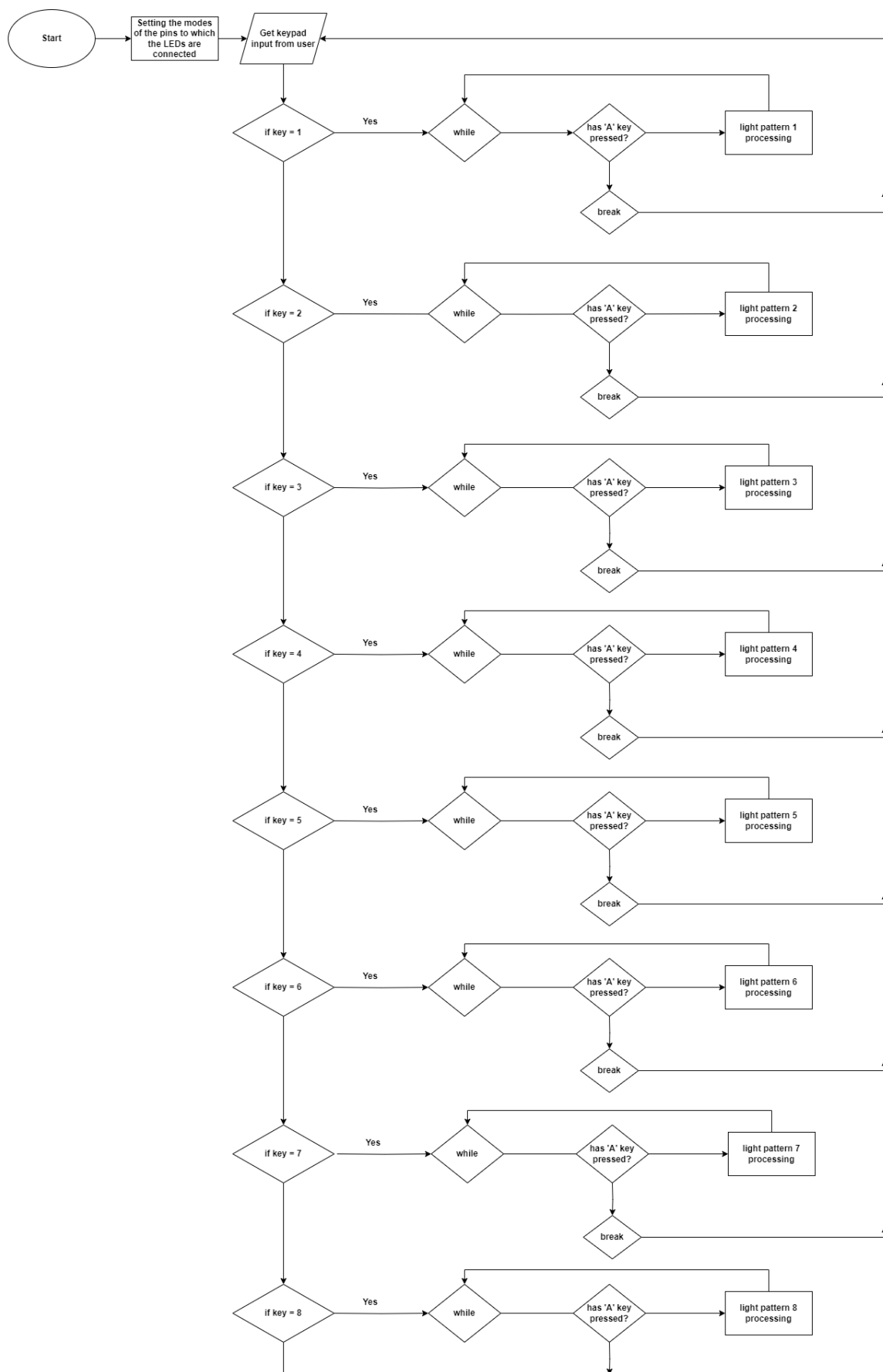
926     key = keys.getKey();
927     if(key=='A'){
928         break;
929     }
930 }
931 }
932 if(key=='#'){
933     while(16){
934         digitalWrite(led1,HIGH);
935         key = keys.getKey();
936         if(key=='A'){
937             break;
938         }
939         digitalWrite(led3,HIGH);
940         key = keys.getKey();
941         if(key=='A'){
942             break;
943         }
944         digitalWrite(led5,HIGH);
945         key = keys.getKey();
946         if(key=='A'){
947             break;
948         }
949         digitalWrite(led7,HIGH);
950         key = keys.getKey();
951         if(key=='A'){
952             break;
953         }
954         delay(500);
955         digitalWrite(led1,LOW);
956         digitalWrite(led3,LOW);
957         digitalWrite(led5,LOW);
958         digitalWrite(led7,LOW);
959         key = keys.getKey();
960         if(key=='A'){
961             break;
962         }
963         digitalWrite(led2,HIGH);
964         key = keys.getKey();
965         if(key=='A'){
966             break;
967         }
968         digitalWrite(led4,HIGH);
969         key = keys.getKey();
970         if(key=='A'){
971             break;

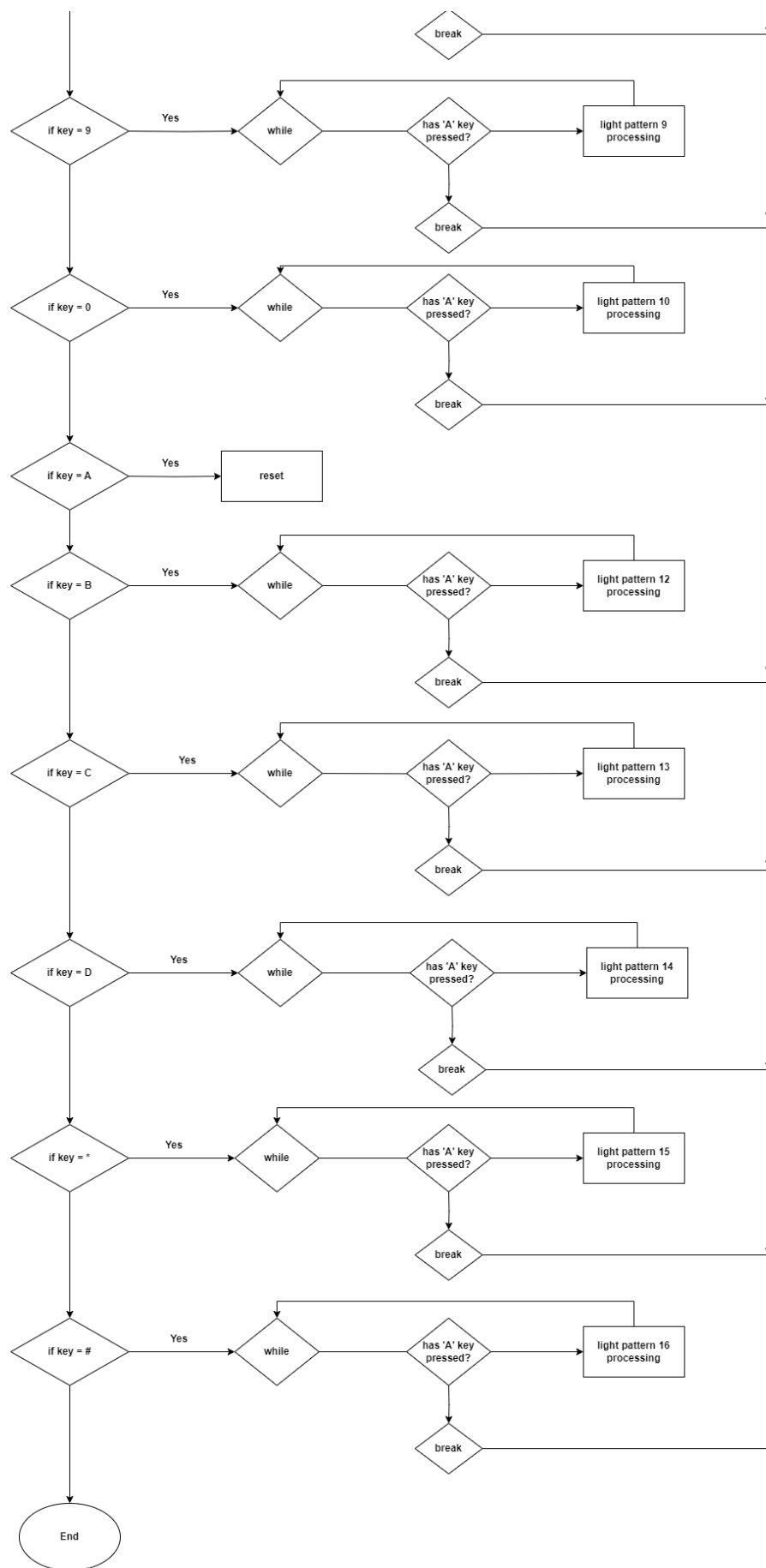
```

- 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





## 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

181110059 Fatma Başak ÖZKASAP

191180005 Selin Cansu AKBAŞ

191180006 Mert AKGÜÇ

C191130040 Metehan ERKAN

The screenshot shows a Google Meet interface with a presentation slide titled "a.png" displayed in the center. The slide contains a UML diagram for a light pattern processing system. The diagram starts with a "Start" node, followed by a process "Setting the modes of the code to connect the LEDs are connected". This leads to a decision diamond "if key = 1". If the answer is "Yes", it goes to "light pattern 1 processing"; if "No", it goes to "if key = 2". This pattern continues for keys 2, 3, 4, and 5. After "if key = 5", the flow goes to "Pattern process continues", then "pattern data reading", "LED control", "555 timer process", and finally "Return".

On the right side of the screen, there are four video thumbnails of participants: Başak Özkasap, Selin Cansu Akbaş, Mert Akgüç, and You. The bottom status bar shows the time as 10:03 PM and the user as jao-rmx-eus.