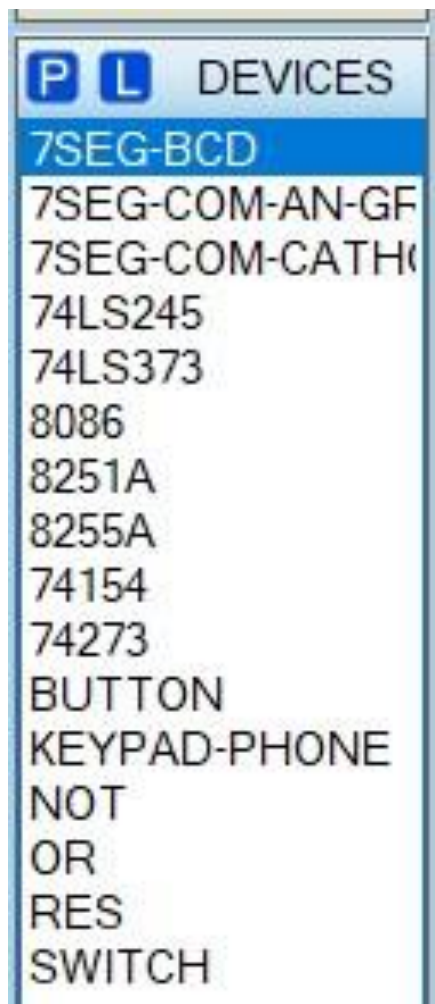# Microprocessors Bonus Simulation Project
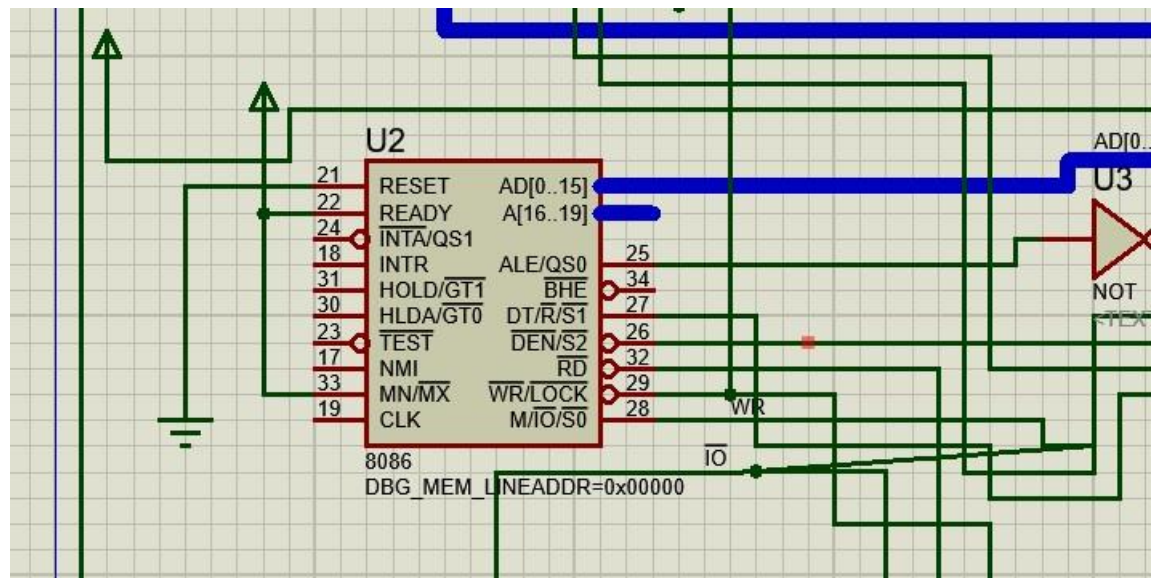
Hakkı Egemen Gülpınar

17-155-014

Computer Engineering 3rd Grade

In this project, a simulation is designed that projects the keys pressed on the screen. I used the following devices →
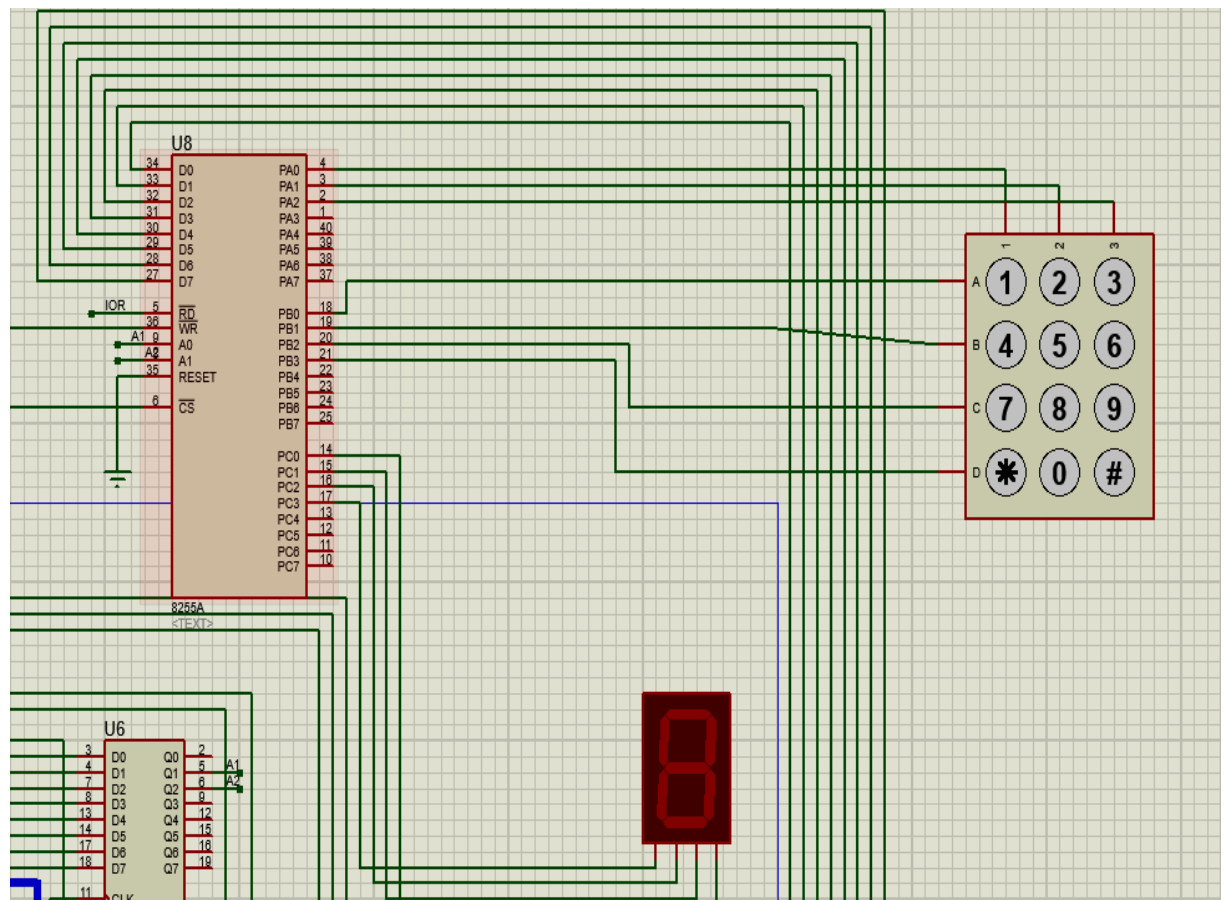
1- 8086 microprocessor
2- 8255A for i/o
3- 3X4 KEYPAD
4- 2 74273 LATCHES for address
5- 2(8K) ROM
6- 2(8K) RAM
7- 74LS245 DATA BUFFER for data transiving
8- 2 INVERTOR
9- 4 OR GATES
10- CLOCK GENERATOR CIRCUIT
the connection will presented in parts

→

P L DEVICES

7SEG-BCD
7SEG-COM-AN-GF
7SEG-COM-CATH(
74LS245
74LS373
8086
8251A
8255A
74154
74273
BUTTON
KEYPAD-PHONE
NOT
OR
RES
SWITCH

8086 circuit in the simulation

➔

7SEG BCD,KEYPAD PHONE and 8255A circutis in the simulation

➔

And all device circuits are below

➔
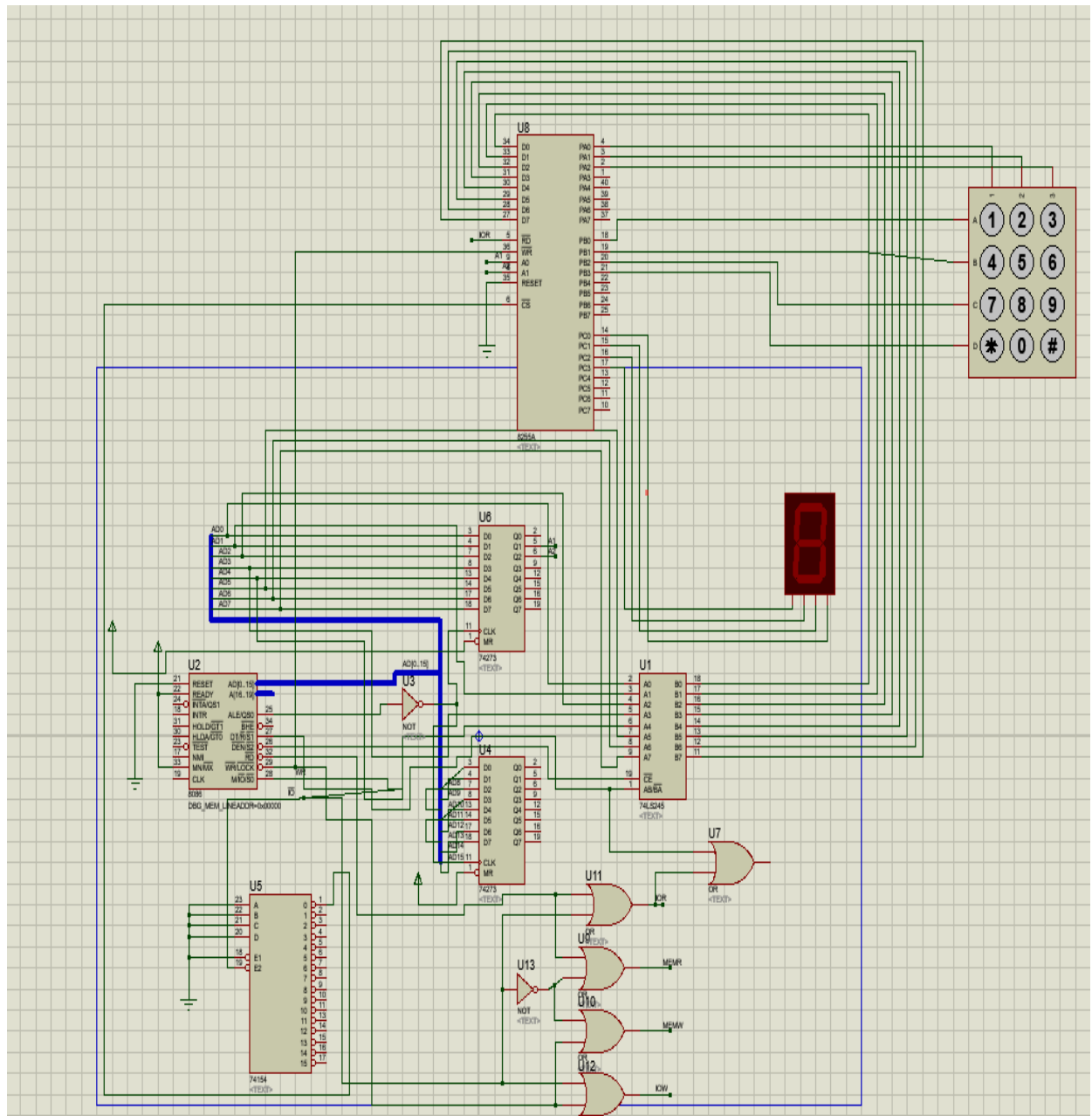
This is the link for short video showing the project in work.

https://yadi.sk/i/JIeUWcyEZZQnwA

All codes are below

```
; multi-segment executable file template.


; HAKKI EGEMEN GULPINAR 17-155-014
MICROPROCESSOR BONUS PROJECT -->

data segment
    ; add your data here!
    task_data db 100 dup(0)
    task_id   dw 0
    PORTA EQU 00H
    PORTB EQU 02H
```

```
    PORTC EQU 04H

    PCW   EQU 06H


ends


stack segment

    dw   128  dup(0)
ends


code segment
start:
; set segment registers:

    mov ax, data

    mov ds, ax

    mov es, ax

    MOV DX,PCW

    MOV AL,10000010B

    OUT DX,AL

   BEGIN:
```

```asm
        MOV CX,00FFH

        MOV AL,0FEH

        MOV DX,PORTA

        OUT DX,AL


EELOOP:

;MOV AL,PORTB

 IN AL,PORTB

 CMP AL,0FEH

 JNE NEXT1

 MOV AL,001H;

 OUT PORTC,AL;

 OUT PORTC,AL

 JMP GO

 NEXT1: CMP AL,0FDH

 JNE NEXT2

 MOV AL,004H;

 OUT PORTC,AL;

 OUT PORTC,AL

 JMP GO
```

```asm
NEXT2:
CMP AL,0FBH
JNE NEXT3
MOV AL,007H;
OUT PORTC,AL;
OUT PORTC,AL
JMP GO
NEXT3:
CMP AL,0F7H
JNE GO
MOV AL,00BH;
OUT PORTC,AL;
OUT PORTC,AL
GO:
LOOP EELOOP

MOV CX,00FFH
MOV AL,0FDH
MOV DX,PORTA
OUT DX,AL
```

```asm
EELOOP2:

;MOV AL,PORTB

 IN AL,PORTB

 CMP AL,0FEH

 JNE NEXT12

 MOV AL,002H;

 OUT PORTC,AL;

 OUT PORTC,AL

 JMP GO2

 NEXT12: CMP AL,0FDH

 JNE NEXT22

 MOV AL,005H;

 OUT PORTC,AL;

 OUT PORTC,AL

 JMP GO2

 NEXT22:

 CMP AL,0FBH

 JNE NEXT32

 MOV AL,008H;
```

```
    OUT PORTC,AL;

    OUT PORTC,AL

    JMP GO2

    NEXT32:

    CMP AL,0F7H

    JNE GO2

    MOV AL,000H;

    OUT PORTC,AL;

    OUT PORTC,AL


    GO2:

    LOOP EELOOP2


    MOV CX,00FFH

    MOV AL,0FBH

    MOV DX,PORTA

    OUT DX,AL


    EELOOP3:

    ;MOV AL,PORTB
```

```asm
IN AL,PORTB

CMP AL,0FEH

JNE NEXT13

MOV AL,003H;

OUT PORTC,AL;

OUT PORTC,AL

JMP GO3

NEXT13: CMP AL,0FDH

JNE NEXT23

MOV AL,006H;

OUT PORTC,AL;

OUT PORTC,AL

JMP GO3

NEXT23:

CMP AL,0FBH

JNE NEXT33

MOV AL,009H;

OUT PORTC,AL;

OUT PORTC,AL

JMP GO3
```

```
NEXT33:
 CMP AL,0F7H
JNE GO3
 MOV AL,00CH;
 OUT PORTC,AL;
 OUT PORTC,AL
 GO3:
LOOP EELOOP3
JMP BEGIN

JMP BEGIN
end start
```