MODUL KEYPAD, SEVEM SEGMENT, DAN BUZZER

Mata Kuliah : Interface, Peripheral, dan Komunikasi

Kode Dosen : AJR

Kelas : D3TK-43-02

Anggota Kelompok :

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A. Tujuan

Maksud dan tujuan dari praktikum ini adalah :

1. Mahasiswa mampu menggunakan pin-pin pada mikrokontroler dalam mengendalikan modul Keypad, Seven Segmen dan Buzzer
2. Mahasiswa mampu menyelesaikan kasus tertentu dengan mengunakan Keypad, Seven Segmen dan Buzzer dalam mikrokontroler.

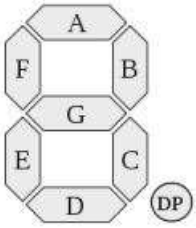
B. Alat dan Bahan

Peralatan yang dibutuhkan dalam praktikum ini adalah :

1. 1 buah Arduino Uno R3 + Kabel USB
2. Jumper + header Secukupnya
3. 7 buah Resistor 330 Ohm (optional)
4. 3 buah LED (optional)
5. 1 buah potensio
6. 1 buah Protoboard
7. 1 buah LCD 16x2
8. 1 buah pin header 16x1
9. 1 buah IC Shift register 4094
10. 1 keypad 3x4
11. 1 seven segmen katoda
12. 1 buzzer
13. 1 push button

C. Teori dasar

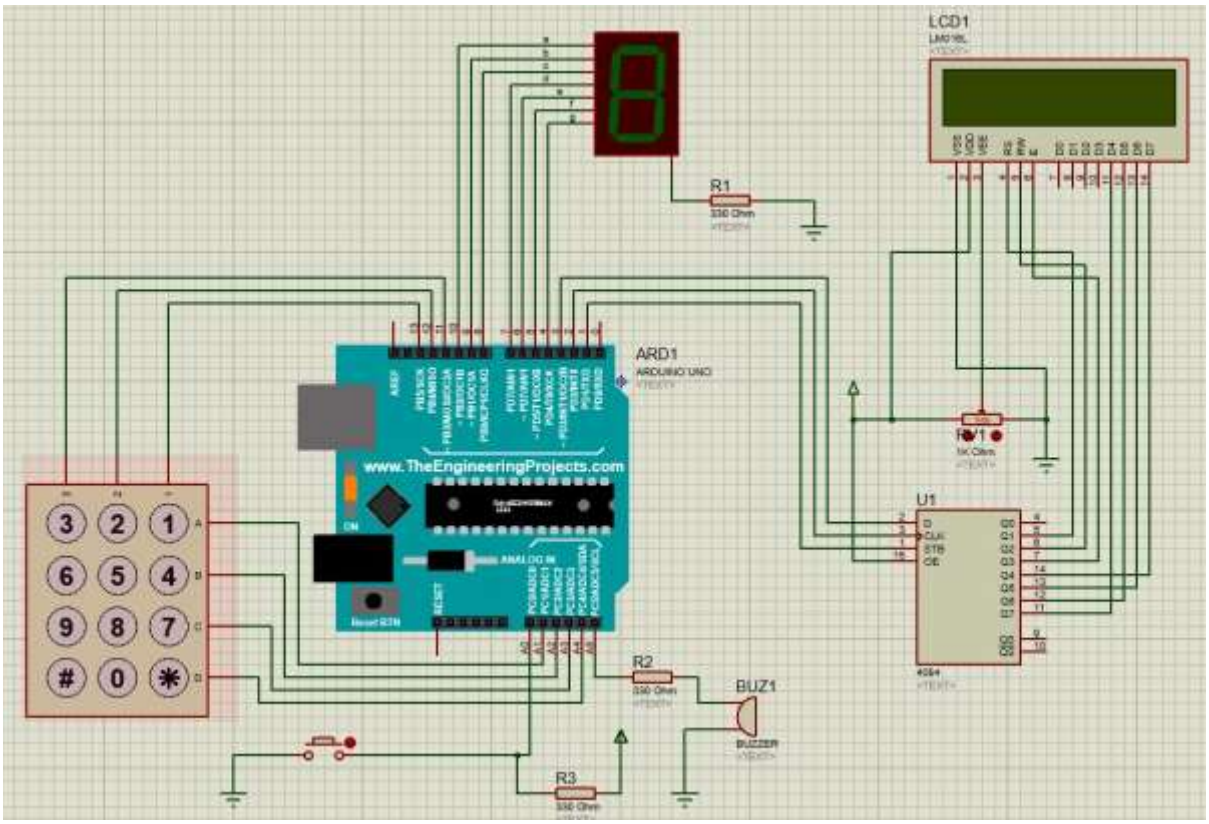
Display 7 segment merupakan komponen yang berfungsi sebagai penampil karakter angka dan karakter huruf. Display 7 segment sering juga disebut sebgai penampil 7 ruas. Pada display 7 segment juga dilengkapi karakter titik (dot) yang sering dibutuhkan untuk karakter koma atau titik pada saat menampilkan suatu bilangan. Display 7 segment terdiri dari 7 penampil karakter yang disusun dalam sebuah kemasan sehingga dapat menampilkan karakter angka dan karakter huruf. Terdapat 7 buah penampil dasar dari LED (Light Emiting Diode) yang dinamakan karakter A-F dan karakter dot. Bentuk susunan karakter penampil karakter A-F pada display 7 segmen dapat dilihat pada gambar berikut.



Bentuk Susunan Karakter Display 7 Segment 7 segment,penampil 7 ruas,teori 7 segment,teori penampil 7 ruas,susunan display 7 segment,pengertian display 7 segment,definisi dispaly 7 ruas Pada dasarnya penampil 7 segment merupakan rangkaian 7 buah dioda LED (Light Emiting Diode).

Terdapat 2 (dua) jenis rangkaian dasar dari display 7 segment yang dikenal sebagai display 7 segment common anoda (CA) dan common cathoda (CC). Pada display common anoda untuk mengaktifkan karakter display 7 segment diperlukan logika low (0) pada jalur A-F dan DP dan sebaliknya untuk display 7 segment common cathoda (CA).

D. Hasil Percobaan



1a.

1a

```
int C[]={13,12,11};
char R[]={A1,A2,A3,A4};
char keymap[4][3]={
  {'1','2','3'},
  {'4','5','6'},
  {'7','8','9'},
  {'*','0','#'}
};
char key;

void setup(){
  for(int i=0; i<3; i++){
    pinMode(C[i],INPUT);}
  for(int i=0; i<4; i++){
    pinMode(R[i],OUTPUT);}
   Serial.begin(9600);
}
void loop(){
  scankeypad();
  Serial.println(key);
  key=' ';
}
void scankeypad(){
  for(int i=0; i<4; i++){
    digitalWrite(R[i],LOW);
    for(int j=0; j<3; j++){
      if(digitalRead(C[j])==LOW){
        key=keymap[i][j];
        delay(500);
      }
    }
    digitalWrite(R[i],HIGH);
  }
}
```

2b.

1b

```
int C[]={13,12,11}; //pin yang terhubung ke pin arduino dari kolom
char R[]={A1,A2,A3,A4}; //pin yang terhubung ke pin arduino dari baris
char keymap[4][3]={ //pendeklarasian keypad 3x4
  {'1','2','3'},
  {'4','5','6'},
  {'7','8','9'},
  {'*','0','#'}
};
char key; // untuk menampung variable dari keymap

void setup(){
  for(int i=0; i<3; i++){ // menjadi semua int C[] sebagai INPUT
    pinMode(C[i],INPUT);}
  for(int i=0; i<4; i++){
    pinMode(R[i],OUTPUT);} // menjadi semua int R[] sebagai OUTPUT
   Serial.begin(9600);
}
void loop(){
  scankeypad(); //masuk ke void scankeypad
  Serial.println(key);
  key=' ';
}
void scankeypad(){ // untuk menscan angka yang ada di keymap
  for(int i=0; i<4; i++){
    digitalWrite(R[i],LOW);
    for(int j=0; j<3; j++){
      if(digitalRead(C[j])==LOW){
        key=keymap[i][j]; // menampilkan angka yang ada di keymap baris dan kolom tertentu
        delay(500);
      }
    }
    digitalWrite(R[i],HIGH); // agar angka bisa berurutan
  }
}
```

1c.

1c

```
#include <LiquidCrystal_SR_LCD3.h>
#include <Keypad.h>
const byte ROWS = 4;
const byte COLS = 3;
const int PIN_LCD_STROBE = 1;
const int PIN_LCD_DATA = 3;
const int PIN_LCD_CLOCK = 2;
LiquidCrystal_SR_LCD3 lcd
(PIN_LCD_DATA,PIN_LCD_CLOCK,PIN_LCD_STROBE);
char keymap[ROWS][COLS]={
  {'3','2','1'},
  {'6','5','4'},
  {'9','8','7'},
  {'#','0','*'}
};
byte rowPins[ROWS] = {A1,A2,A3,A4};
byte colPins[COLS] = {11,12,13};

Keypad keypad = Keypad( makeKeymap(keymap), rowPins, colPins, ROWS, COLS );

void setup(){
   lcd.begin(16,2);
}
void loop(){
  char key = keypad.getKey();
  if (key){
    lcd.print(key);
  }
}
```

2a.

2a

```
int a=10;
int b=9;
int c=8;
int d=7;
int e=6;
int f=5;
int g=4;

void setup(){
  for(int i=10; i>=4; i--){
    pinMode(i,OUTPUT);
  }
}
void loop(){
  for(int i=0; i<=2; i++){
    segment(i);
    delay(1000);
  }
}
void segment(int angka){
  if(angka==0){
    digitalWrite(a,HIGH);
    digitalWrite(b,HIGH);
    digitalWrite(c,HIGH);
    digitalWrite(d,HIGH);
    digitalWrite(e,HIGH);
    digitalWrite(f,HIGH);
    digitalWrite(g,HIGH);
  }if(angka==1){
    digitalWrite(a,LOW);
    digitalWrite(b,HIGH);
    digitalWrite(c,HIGH);
    digitalWrite(d,LOW);
    digitalWrite(e,LOW);
    digitalWrite(f,LOW);
    digitalWrite(g,LOW);
  }
  if(angka==2){
    digitalWrite(a,HIGH);
    digitalWrite(b,HIGH);
    digitalWrite(c,LOW);
    digitalWrite(d,HIGH);
    digitalWrite(e,HIGH);
    digitalWrite(f,LOW);
    digitalWrite(g,HIGH);
```

2ca.

2ca

```
int a=10;
int b=9;
int c=8;
int d=7;
int e=6;
int f=5;
int g=4;

void setup(){
  for(int a=10; a>=4; a--){
    pinMode(a,OUTPUT);
  }
}
void loop(){
  for(int i=0; i<=9; i++){
    segment(i);
    delay(1000);
  }
}
void segment(int angka){
  if(angka==0){
    digitalWrite(a,HIGH);
    digitalWrite(b,HIGH);
    digitalWrite(c,HIGH);
    digitalWrite(d,HIGH);
    digitalWrite(e,HIGH);
    digitalWrite(f,HIGH);
    digitalWrite(g,LOW);
  }if(angka==1){
    digitalWrite(a,LOW);
    digitalWrite(b,HIGH);
    digitalWrite(c,HIGH);
    digitalWrite(d,LOW);
    digitalWrite(e,LOW);
    digitalWrite(f,LOW);
    digitalWrite(g,LOW);
  }
```

```
  }if(angka==5){
    digitalWrite(a,HIGH);
    digitalWrite(b,LOW);
    digitalWrite(c,HIGH);
    digitalWrite(d,HIGH);
    digitalWrite(e,LOW);
    digitalWrite(f,HIGH);
    digitalWrite(g,HIGH);
  }if(angka==6){
    digitalWrite(a,HIGH);
    digitalWrite(b,LOW);
    digitalWrite(c,HIGH);
    digitalWrite(d,HIGH);
    digitalWrite(e,HIGH);
    digitalWrite(f,HIGH);
    digitalWrite(g,HIGH);
  }if(angka==7){
    digitalWrite(a,HIGH);
    digitalWrite(b,HIGH);
    digitalWrite(c,HIGH);
    digitalWrite(d,LOW);
    digitalWrite(e,LOW);
    digitalWrite(f,LOW);
    digitalWrite(g,LOW);
  }if(angka==8){
    digitalWrite(a,HIGH);
    digitalWrite(b,HIGH);
    digitalWrite(c,HIGH);
    digitalWrite(d,HIGH);
    digitalWrite(e,HIGH);
    digitalWrite(f,HIGH);
    digitalWrite(g,HIGH);
  } if(angka==9){
    digitalWrite(a,HIGH);
    digitalWrite(b,HIGH);
    digitalWrite(c,HIGH);
    digitalWrite(d,LOW);
    digitalWrite(e,LOW);
    digitalWrite(f,HIGH);
    digitalWrite(g,HIGH);
  }
}
```

2cb.

2cb

```
#include <Keypad.h>
int a=10;
int b=9;
int c=8;
int d=7;
int e=6;
int f=5;
int g=4;
const byte ROWS = 4;
const byte COLS = 3;
char keymap[ROWS][COLS]={
  {'3','2','1'},
  {'6','5','4'},
  {'9','8','7'},
  {'#','0','*'}
};
byte rowPins[ROWS] = {A1,A2,A3,A4};
byte colPins[COLS] = {11,12,13};

Keypad mkeypad = Keypad( makeKeymap(keymap), rowPins, colPins, ROWS, COLS );

void setup(){
  for(int a=10; a>=4; a--){
    pinMode(a,OUTPUT);
  }
}
void loop(){
  char angka = mkeypad.getKey();
  if(angka == '0'){
    digitalWrite(a,HIGH);
    digitalWrite(b,HIGH);
    digitalWrite(c,HIGH);
    digitalWrite(d,HIGH);
    digitalWrite(e,HIGH);
    digitalWrite(f,HIGH);
    digitalWrite(g,LOW);
  }if(angka == '1'){
    digitalWrite(a,LOW);
    digitalWrite(b,HIGH);
    digitalWrite(c,HIGH);
    digitalWrite(d,LOW);
    digitalWrite(e,LOW);
    digitalWrite(f,LOW);
    digitalWrite(g,LOW);
  }
```

```
  }if(angka == '5'){
    digitalWrite(a,HIGH);
    digitalWrite(b,LOW);
    digitalWrite(c,HIGH);
    digitalWrite(d,HIGH);
    digitalWrite(e,LOW);
    digitalWrite(f,HIGH);
    digitalWrite(g,HIGH);
  }if(angka == '6'){
    digitalWrite(a,HIGH);
    digitalWrite(b,LOW);
    digitalWrite(c,HIGH);
    digitalWrite(d,HIGH);
    digitalWrite(e,HIGH);
    digitalWrite(f,HIGH);
    digitalWrite(g,HIGH);
  }if(angka == '7'){
    digitalWrite(a,HIGH);
    digitalWrite(b,HIGH);
    digitalWrite(c,HIGH);
    digitalWrite(d,LOW);
    digitalWrite(e,LOW);
    digitalWrite(f,LOW);
    digitalWrite(g,LOW);
  }if(angka == '8'){
    digitalWrite(a,HIGH);
    digitalWrite(b,HIGH);
    digitalWrite(c,HIGH);
    digitalWrite(d,HIGH);
    digitalWrite(e,HIGH);
    digitalWrite(f,HIGH);
    digitalWrite(g,HIGH);
  } if(angka == '9'){
    digitalWrite(a,HIGH);
    digitalWrite(b,HIGH);
    digitalWrite(c,HIGH);
    digitalWrite(d,LOW);
    digitalWrite(e,LOW);
    digitalWrite(f,HIGH);
    digitalWrite(g,HIGH);
  }
}
```

3a.

3a

```
char buzzer=A5;
void setup(){
  pinMode(buzzer,OUTPUT);
}
void loop(){
  digitalWrite(buzzer,HIGH);
  delay(1000);
  digitalWrite(buzzer,LOW);
  delay(1000);
}
```

3b.

3b

```
char buzzer=A5; //penempatan pin buzzer
void setup(){
  pinMode(buzzer,OUTPUT); //buzzer sebagai output
}
void loop(){
  digitalWrite(buzzer,HIGH); //buzer menyala
  delay(1000);
  digitalWrite(buzzer,LOW); //buzzer mati
  delay(1000);
}
```

3ca.

3ca

```
char buzzer=A5;
int a=10;
int b=9;
int c=8;
int d=7;
int e=6;
int f=5;
int g=4;

void setup(){
  for(int a=10; a>=4; a--){
    pinMode(a,OUTPUT);
  }
  pinMode(buzzer,OUTPUT);
}
void loop(){
  for(int i=9; i>=0; i--){
    segment(i);
    delay(1000);
  }
}
void segment(int angka){
  if(angka==0){
    digitalWrite(a,HIGH);
    digitalWrite(b,HIGH);
    digitalWrite(c,HIGH);
    digitalWrite(d,HIGH);
    digitalWrite(e,HIGH);
    digitalWrite(f,HIGH);
    digitalWrite(g,LOW);
    digitalWrite(buzzer,HIGH);
    delay(1000);
    digitalWrite(buzzer,LOW);
  }if(angka==1){
    digitalWrite(a,LOW);
    digitalWrite(b,HIGH);
    digitalWrite(c,HIGH);
    digitalWrite(d,LOW);
    digitalWrite(e,LOW);
    digitalWrite(f,LOW);
    digitalWrite(g,LOW);
  }
if(angka==2){
  digitalWrite(a,HIGH);
  digitalWrite(b,HIGH);
  digitalWrite(c,LOW);
  digitalWrite(d,HIGH);
  digitalWrite(e,HIGH);
  digitalWrite(f,LOW);
  digitalWrite(g,HIGH);
}if(angka==3){
  digitalWrite(a,HIGH);
  digitalWrite(b,HIGH);
  digitalWrite(c,HIGH);
  digitalWrite(d,HIGH);
  digitalWrite(e,LOW);
  digitalWrite(f,LOW);
  digitalWrite(g,HIGH);
}if(angka==4){
  digitalWrite(a,LOW);
  digitalWrite(b,HIGH);
  digitalWrite(c,HIGH);
  digitalWrite(d,LOW);
  digitalWrite(e,LOW);
  digitalWrite(f,HIGH);
  digitalWrite(g,HIGH);
}if(angka==5){
  digitalWrite(a,HIGH);
  digitalWrite(b,LOW);
  digitalWrite(c,HIGH);
  digitalWrite(d,HIGH);
  digitalWrite(e,LOW);
  digitalWrite(f,HIGH);
  digitalWrite(g,HIGH);
}if(angka==6){
  digitalWrite(a,HIGH);
  digitalWrite(b,LOW);
  digitalWrite(c,HIGH);
  digitalWrite(d,HIGH);
  digitalWrite(e,HIGH);
  digitalWrite(f,HIGH);
```

3cb.

3cb

```
char buzzer=A5;
char button=A0;
void setup(){
  pinMode(button,INPUT);
  pinMode(buzzer,OUTPUT);
}
void loop(){
  if(digitalRead(button)==HIGH){
    for(int i=0; i<=255; i++){
      digitalWrite(buzzer,i);
      delay(100);
    }
  }
}
```

6a.

```
#include <LiquidCrystal_SR_LCD3.h>
#include <Keypad.h>
int a=10;
int b=9;
int c=8;
int d=7;
int e=6;
int f=5;
int g=4;

char buzzer=A5;
char button=A0;

const byte ROWS = 4;
const byte COLS = 3;
char keymap[ROWS][COLS]={
  {'3','2','1'},
  {'6','5','4'},
  {'9','8','7'},
  {'#','0','*'}
};
byte rowPins[ROWS] = {A1,A2,A3,A4};
byte colPins[COLS] = {11,12,13};

Keypad mkeypad = Keypad( makeKeymap(keymap), rowPins, colPins, ROWS, COLS );

const int PIN_LCD_STROBE = 1;
const int PIN_LCD_DATA = 3;
const int PIN_LCD_CLOCK = 2;

LiquidCrystal_SR_LCD3 lcd(PIN_LCD_DATA,PIN_LCD_CLOCK,PIN_LCD_STROBE);

char nomer[12];
```

```
void setup(){
  for(int a=10; a>=4; a--){
    pinMode(a,OUTPUT);
  }
  pinMode(buzzer,OUTPUT);
  pinMode(button,INPUT);
  lcd.begin(16,2);
}
void loop(){
  for(int i=0; i<12; i++){
    char angka = mkeypad.getKey();
    nomer[i]=angka;
    if(angka){
      lcd.print(angka);
    }
    if(digitalRead(button) == LOW){
      for (int j=0; j<12; j++){
        if(nomer[j] == '0'){
          digitalWrite(a,HIGH);
          digitalWrite(b,HIGH);
          digitalWrite(c,HIGH);
          digitalWrite(d,HIGH);
          digitalWrite(e,HIGH);
          digitalWrite(f,HIGH);
          digitalWrite(g,LOW);
        }if(nomer[j] == '1'){
          digitalWrite(a,LOW);
          digitalWrite(b,HIGH);
          digitalWrite(c,HIGH);
          digitalWrite(d,LOW);
          digitalWrite(e,LOW);
          digitalWrite(f,LOW);
          digitalWrite(g,LOW);
        }if(nomer[j] == '2'){
          digitalWrite(a,HIGH);
          digitalWrite(b,HIGH);
          digitalWrite(c,LOW);
          digitalWrite(d,HIGH);
          digitalWrite(e,HIGH);
          digitalWrite(f,LOW);
          digitalWrite(g,HIGH);
        }if(nomer[j] == '3'){
          digitalWrite(a,HIGH);
          digitalWrite(b,HIGH);
          digitalWrite(c,HIGH);
          digitalWrite(d,HIGH);
          digitalWrite(e,LOW);
          digitalWrite(f,LOW);
          digitalWrite(g,HIGH);
        }if(nomer[j] == '4'){
          digitalWrite(a,LOW);
          digitalWrite(b,HIGH);
          digitalWrite(c,HIGH);
          digitalWrite(d,LOW);
          digitalWrite(e,LOW);
          digitalWrite(f,HIGH);
          digitalWrite(g,HIGH);
        }if(nomer[j] == '5'){
          digitalWrite(a,HIGH);
          digitalWrite(b,LOW);
          digitalWrite(c,HIGH);
          digitalWrite(d,HIGH);
          digitalWrite(e,LOW);
          digitalWrite(f,HIGH);
          digitalWrite(g,HIGH);
        }if(nomer[j] == '6'){
          digitalWrite(a,HIGH);
          digitalWrite(b,LOW);
          digitalWrite(c,HIGH);
          digitalWrite(d,HIGH);
          digitalWrite(e,HIGH);
          digitalWrite(f,HIGH);
          digitalWrite(g,HIGH);
        }if(nomer[j] == '7'){
          digitalWrite(a,HIGH);
          digitalWrite(b,HIGH);
          digitalWrite(c,HIGH);
          digitalWrite(d,LOW);
          digitalWrite(e,LOW);
          digitalWrite(f,LOW);
          digitalWrite(g,LOW);

        }if(nomer[j] == '8'){
            digitalWrite(a,HIGH);
            digitalWrite(b,HIGH);
            digitalWrite(c,HIGH);
            digitalWrite(d,HIGH);
            digitalWrite(e,HIGH);
            digitalWrite(f,HIGH);
            digitalWrite(g,HIGH);
        } if(nomer[j] == '9'){
            digitalWrite(a,HIGH);
            digitalWrite(b,HIGH);
            digitalWrite(c,HIGH);
            digitalWrite(d,LOW);
            digitalWrite(e,LOW);
            digitalWrite(f,HIGH);
            digitalWrite(g,HIGH);
        }
        }
        digitalWrite(buzzer,HIGH);
        delay(1000);
        digitalWrite(buzzer,LOW);
      }
    }
}
```

E. Kesimpulan

Kesimpulan yang kita dapat dari praktikum kali ini adalah kita dapat membuat indicator 7 segment pada Arduino dengan memanfaatkan keypad sebagai alat untuk menentukan indikaotr angka yang akan muncul dan buzzer sebagai indicator suara jika kita berikan command tertentu

F. Link Video Praktikum