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Spillway mikrokontroler ATMEGA16

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*****/
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```
#include <mega16.h>
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```
#include <stdio.h>
```

```
#include <delay.h>
```

```
// Alphanumeric LCD Module functions
```

```
#asm
```

```
.equ __lcd_port=0x12 ;PORTD
```

```
#endasm
```

```
#include <lcd.h>
```

```
flash unsigned char pintu_tutup[8]={
```

```
0b11111111,
```

```
0b11111111,
```

```
0b11111111,
```

```
0b11111111,
```

```
0b11111111,
```

```
0b11111111,
```

```
0b11111111,
```

```
0b11111111};
```

```
flash unsigned char pintu_setengah[8]={
```

```
0b11111111,
```

```
0b11111111,
```

```
0b11111111,
```

```
0b11111111,
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```
0b00010001,  
0b00010001,  
0b00010001,  
0b00010001};  
flash unsigned char pintu_buka[8]={  
0b11111111,  
0b00010001,  
0b00010001,  
0b00010001,  
0b00010001,  
0b00010001,  
0b00010001,  
0b00010001,  
0b00010001};  
flash unsigned char panah_atas[8]={  
0b00000100,  
0b00001110,  
0b00010101,  
0b00000100,  
0b00000100,  
0b00000100,  
0b00000100,  
0b00000100,  
0b00000100};  
flash unsigned char panah_bawah[8]={  
0b00000100,  
0b00000100,  
0b00000100,  
0b00000100,
```

```

0b00000100,
0b00010101,
0b00001110,
0b00000100};
/* function used to define user characters */
void define_char(unsigned char flash *pc,unsigned char char_code)
{
unsigned char i,a;
a=(char_code<<3) | 0x40;
for (i=0; i<8; i++) lcd_write_byte(a++,*pc++);
}
// Declare your global variables here
eeprom unsigned char waktubuka=0;
eeprom unsigned int delaysensor=0;
unsigned char sensor,sensortd,ceksensor,keadaan,keadaantd; //0b0000DCBA
//unsigned char output;
void lcdvar(unsigned char kol, unsigned char bar, unsigned char variabel)
{
unsigned char variabelsementara;
variabelsementara=variabel;

lcd_gotoxy(kol,bar);
// if((variabel&0b11110000)!=0b11110000)
// {
// if((variabelsementara&0b10000000)==0b10000000) lcd_putchar('1'); else
lcd_putchar('0');
// if((variabelsementara&0b01000000)==0b01000000) lcd_putchar('1'); else
lcd_putchar('0');

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// if((variabelsementara&0b00100000)==0b00100000) lcd_putchar('1'); else
lcd_putchar('0');

// if((variabelsementara&0b00010000)==0b00010000) lcd_putchar('1'); else
lcd_putchar('0');

// }

if((variabelsementara&0b00001000)==0b00001000) lcd_putchar('1'); else lcd_putchar('0');
if((variabelsementara&0b00000100)==0b00000100) lcd_putchar('1'); else lcd_putchar('0');
if((variabelsementara&0b00000010)==0b00000010) lcd_putchar('1'); else lcd_putchar('0');
if((variabelsementara&0b00000001)==0b00000001) lcd_putchar('1'); else lcd_putchar('0');
}

//pintu  2 3 1 4

//PORTA=0b 00 00 00 00

// "P1 P2 P3 P4"

// "0123456789abcdef"

void pintu()
{
if(PORTA.7==1) {lcd_gotoxy(6,1); lcd_putchar(3);}
if(PORTA.6==1) {lcd_gotoxy(6,1); lcd_putchar(4);}
if(PORTA.5==1) {lcd_gotoxy(10,1); lcd_putchar(3);}
if(PORTA.4==1) {lcd_gotoxy(10,1); lcd_putchar(4);}
if(PORTA.3==1) {lcd_gotoxy(2,1); lcd_putchar(3);}
if(PORTA.2==1) {lcd_gotoxy(2,1); lcd_putchar(4);}
if(PORTA.1==1) {lcd_gotoxy(14,1); lcd_putchar(3);}
if(PORTA.0==1) {lcd_gotoxy(14,1); lcd_putchar(4);}
}

void keadaan_pintu()
{
if(keadaan==0b11111111)

```

```
{  
    lcd_gotoxy( 2,1); lcd_putchar(0);  
    lcd_gotoxy( 6,1); lcd_putchar(0);  
    lcd_gotoxy(10,1); lcd_putchar(0);  
    lcd_gotoxy(14,1); lcd_putchar(0);  
}  
else if(keadaan==0b11111110)  
{  
    lcd_gotoxy( 2,1); lcd_putchar(0);  
    lcd_gotoxy( 6,1); lcd_putchar(1);  
    lcd_gotoxy(10,1); lcd_putchar(1);  
    lcd_gotoxy(14,1); lcd_putchar(0);  
}  
else if(keadaan==0b11111100)  
{  
    lcd_gotoxy( 2,1); lcd_putchar(1);  
    lcd_gotoxy( 6,1); lcd_putchar(1);  
    lcd_gotoxy(10,1); lcd_putchar(1);  
    lcd_gotoxy(14,1); lcd_putchar(1);  
}  
else if(keadaan==0b11111000)  
{  
    lcd_gotoxy( 2,1); lcd_putchar(1);  
    lcd_gotoxy( 6,1); lcd_putchar(2);  
    lcd_gotoxy(10,1); lcd_putchar(2);  
    lcd_gotoxy(14,1); lcd_putchar(1);  
}
```

```
else if(keadaan==0b11110000)
{
  lcd_gotoxy( 2,1); lcd_putchar(2);
  lcd_gotoxy( 6,1); lcd_putchar(2);
  lcd_gotoxy(10,1); lcd_putchar(2);
  lcd_gotoxy(14,1); lcd_putchar(2);
}
}
void cekkeadaan()
{
  unsigned int timersensor=2; //tambah 200ms;
  ceksensor=sensor;
  //PORTA=0xFF;
  //PORTC=0xFF;
  while((sensor==ceksensor)&&(timersensor!=delaysensor))
  {
    ceksensor=PINB|0b11110000;
    timersensor++;
    lcdvar(7,0,sensor);
    lcdvar(12,0,keadaan);
    delay_ms(100);
  }
  if((sensor==ceksensor)&&(timersensor==delaysensor)) {keadaan=ceksensor; } else
  if((sensor!=ceksensor)&&(timersensor==delaysensor)) {keadaan=ceksensor; }
  lcdvar(12,0,keadaan);

  //pintu 2 3 1 4
```

```

//PORTA=0b 00 00 00 00
//PORTA=0b10100000; pintu 2&3 buka;
//PORTA=0b01010000; pintu 2&3 tutup;
//PORTA=0b00001010; pintu 1&4 buka;
//PORTA=0b00000101; pintu 1&4 tutup;
//PORTA=0b 11 00 00 00 {!! sinyal untuk naik dan turun tidak boleh bersamaan !!}
if(keadaan!=keadaantd)
{
if(keadaantd==0b11111111)
{
if(keadaan==0b11111110) {PORTA=0b10100000;pintu();delay_ms(200);}else
if(keadaan==0b11111100) {PORTA=0b10101010;pintu();delay_ms(200);}else
if(keadaan==0b11111000) {PORTA=0b10101010;pintu();delay_ms(200);
PORTA=0b10100000;pintu();delay_ms(200);}else
if(keadaan==0b11110000) {PORTA=0b10101010;pintu();delay_ms(400);}
}
else if(keadaantd==0b11111110)
{
if(keadaan==0b11111111) {PORTA=0b01010000;pintu();delay_ms(200);}else
if(keadaan==0b11111100) {PORTA=0b00001010;pintu();delay_ms(200);}else
if(keadaan==0b11111000) {PORTA=0b10101010;pintu();delay_ms(200);}else
if(keadaan==0b11110000) {PORTA=0b10101010;pintu();delay_ms(200);
PORTA=0b00001010;pintu();delay_ms(200);}
}
else if(keadaantd==0b11111100)
{
if(keadaan==0b11111111) {PORTA=0b01010101;pintu();delay_ms(200);}else

```

```

if(keadaan==0b11111110) {PORTA=0b00000101;pintu();delay_ms(200);}else
if(keadaan==0b11111000) {PORTA=0b10100000;pintu();delay_ms(200);}else
if(keadaan==0b11110000) {PORTA=0b10101010;pintu();delay_ms(200);}
}
else if(keadaantd==0b11111000)
{
if(keadaan==0b11111111) {PORTA=0b01010101;pintu();delay_ms(200);
PORTA=0b01010000;pintu();delay_ms(200);}else
if(keadaan==0b11111110) {PORTA=0b01010101;pintu();delay_ms(200);}else
if(keadaan==0b11111100) {PORTA=0b01010000;pintu();delay_ms(200);}else
if(keadaan==0b11110000) {PORTA=0b00001010;pintu();delay_ms(200);}
}
else if(keadaantd==0b11110000)
{
if(keadaan==0b11111111) {PORTA=0b01010101;pintu();delay_ms(400);}else
if(keadaan==0b11111110) {PORTA=0b01010101;pintu();delay_ms(200);
PORTA=0b01010000;pintu();delay_ms(200);}else
if(keadaan==0b11111100) {PORTA=0b01010101;pintu();delay_ms(200);}else
if(keadaan==0b11111000) {PORTA=0b00000101;pintu();delay_ms(200);}
}
PORTA=0b00000000;keadaan_pintu();
}
//lcd_putsf("0123456789abcdef");
//lcd_putsf("2&3 1/2 1&4
keadaantd=keadaan;
}
void sistem()

```



```

{
sensor=PINB|0b11110000;
//PORTA=sensor; //sementara
PORTC=sensor;
lcd_gotoxy(0,0);
lcd_putsf("Sensor=");
lcdvar(7,0,sensor);
lcdvar(12,0,keadaan);
lcd_gotoxy(0,1);
lcd_putsf("P1 P2 P3 P4");
keadaan_pintu();
delay_ms(100);
if(sensor==0b11111111) { if(sensor!=sensortd) {cekkeadaan();} sensortd=sensor; } else
if(sensor==0b11111110) { if(sensor!=sensortd) {cekkeadaan();} sensortd=sensor; } else
if(sensor==0b11111100) { if(sensor!=sensortd) {cekkeadaan();} sensortd=sensor; } else
if(sensor==0b11111000) { if(sensor!=sensortd) {cekkeadaan();} sensortd=sensor; } else
if(sensor==0b11110000) { if(sensor!=sensortd) {cekkeadaan();} sensortd=sensor; }
//delay_ms(100);
//sensortd=sensor;
}
void main(void)
{
// Port A driver motor
// Func7=Out Func6=Out Func5=Out Func4=Out Func3=Out Func2=Out Func1=Out
Func0=Out
// State7=0 State6=0 State5=0 State4=0 State3=0 State2=0 State1=0 State0=0
PORTA=0x00; //PORTA=0xFF; kalo untuk indikator led
DDRA=0xFF;

```

```
// Port B Sensor
// Func7=In Func6=In Func5=In Func4=In Func3=In Func2=In Func1=In Func0=In
// State7=P State6=P State5=P State4=P State3=P State2=P State1=P State0=P
PORTB=0xFF;
DDRB=0x00;
// Port C no use
// Func7=Out Func6=Out Func5=Out Func4=Out Func3=Out Func2=Out Func1=Out
Func0=Out
// State7=1 State6=1 State5=1 State4=1 State3=1 State2=1 State1=1 State0=1
PORTC=0xFF;
DDRC=0xFF;
// Port D LCD
// Func7=In Func6=In Func5=In Func4=In Func3=In Func2=In Func1=In Func0=In
// State7=T State6=T State5=T State4=T State3=T State2=T State1=T State0=T
PORTD=0x00;
DDRD=0x00;
// Timer/Counter 0 initialization
// Clock source: System Clock
// Clock value: Timer 0 Stopped
// Mode: Normal top=FFh
// OCO output: Disconnected
TCCR0=0x00;
TCNT0=0x00;
OCR0=0x00;
// Timer/Counter 1 initialization
// Clock source: System Clock
// Clock value: Timer 1 Stopped
// Mode: Normal top=FFFFh
```

```
// OC1A output: Discon.
// OC1B output: Discon.
// Noise Canceler: Off
// Input Capture on Falling Edge
// Timer 1 Overflow Interrupt: Off
// Input Capture Interrupt: Off
// Compare A Match Interrupt: Off
// Compare B Match Interrupt: Off
TCCR1A=0x00;
TCCR1B=0x00;
TCNT1H=0x00;
TCNT1L=0x00;
ICR1H=0x00;
ICR1L=0x00;
OCR1AH=0x00;
OCR1AL=0x00;
OCR1BH=0x00;
OCR1BL=0x00;
// Timer/Counter 2 initialization
// Clock source: System Clock
// Clock value: Timer 2 Stopped
// Mode: Normal top=FFh
// OC2 output: Disconnected
ASSR=0x00;
TCCR2=0x00;
TCNT2=0x00;
OCR2=0x00;
```

```
// External Interrupt(s) initialization
// INT0: Off
// INT1: Off
// INT2: Off
MCUCR=0x00;
MCUCSR=0x00;
// Timer(s)/Counter(s) Interrupt(s) initialization
TIMSK=0x00;
// Analog Comparator initialization
// Analog Comparator: Off
// Analog Comparator Input Capture by Timer/Counter 1: Off
ACSR=0x80;
SFIOR=0x00;
// LCD module initialization
lcd_init(16);
define_char(pintu_tutup,0);
define_char(pintu_setengah,1);
define_char(pintu_buka,2);
define_char(panah_atas,3);
define_char(panah_bawah,4);
delaysensor=20;
lcd_gotoxy(0,0);
lcd_putsf("bismillah");
delay_ms(3000);
lcd_clear();
sensor=PINB|0b11110000;
if((sensor==0b11111111)||
```

```
(sensor==0b11111110)||
(sensor==0b11111100)||
(sensor==0b11111000)||
(sensor==0b11110000))
{
keadaantd=sensor;
}
else
{
keadaantd=0b11111111;
}
while (1)
{
sistem();
};
}
```