

## LAMPIRAN

```
/*
This program was produced by the
CodeWizardAVR V1.24.7d Evaluation
Automatic Program Generator
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*/
```

```
Project : "ROBOT PEMINDAH BENDA OTOMATIS"
Version : TUGAS AKHIR
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Company : UNIKA SOEGIJAPRANATA
Comments:
```

"PROGRAM ROBOT"

```
      : B7   A7   :
      : B6   A6   : Stepper 1
      : B5   A5   : lengan 1
      : B4   A4   :
-----
jepit  dc    : B3   A3   :
buka  jepit : B2   A2   : Stepper 2
-----
kananbelok : B1   A1   : lengan 2
kiri      : B0   A0   :
-----
NO      Limit : D7   C7   :
NC      swicth : D6   C6   : Stepper 3
-----
maju    dc    : D5   C5   : kanan-kiri
mundur  : D4   C4   :
-----
      ON-OFF : D3   C3   :
-----
depan Sensor : D2   C2   : Stepper 4
blkng garis : D1   C1   : lengan kecil
blkng      : D0   C0   :
```

```
Chip type      : ATmega8535
Program type   : Application
Clock frequency : 4,000000 MHz
Memory model   : Small
External SRAM size : 0
Data Stack size : 128
```

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*****/
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```
#include <mega8535.h>
#include <delay.h>
#include <stdio.h>
```

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// Declare your global variables here

char i,x1,x2,x3,x4,x5,x6,x7,x8,perempatan;
/*prosedur kontrol motor untuk gerak robot*/

void dc_maju (void)      //MOTOR DC MAJU
{
    PORTD.5=1;
    delay_ms(100);
    PORTD.5=0;
    delay_ms(100);
}
void dc_mundur (void)   //MOTOR DC MUNDUR
{
    PORTD.4=1;
    delay_ms(100);
    PORTD.4=0;
    delay_ms(100);
}
void dc_majulambat (void)
{
    PORTD.5=1;
    delay_ms(500);
    PORTD.5=0;
    delay_ms(800);
}

void robot_kanan (void) //ROBOT BELOK KANAN
{
    dc_mundur();
    delay_ms(100);
    PORTD.4=0;

    PORTB.1=1;
    dc_majulambat();
    delay_ms(1000);
    PORTB.1=0;
    dc_maju();
}

void robot_kiri (void) //ROBOT BELOK KIRI
{
    dc_mundur();
    delay_ms(500);
    PORTD.4=0;
    dc_majulambat();
    PORTB.0=1;
    delay_ms(500);
    PORTB.0=0;
    dc_maju();
}

void step_kanan1 (void) //STEPPER 1 PUTAR KANAN (LENGAN 1)turun
{
    x1=x1>>1;
    delay_ms(50);
}

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        if (x1==0x00){x1=0x08;};
    }
    void step_kiri1 (void) //STEPPER 1 PUTAR KIRI (LENGAN 1)naik
    {
        x1=x1<<1;
        delay_ms(50);
        if (x1==0x10) {x1=0x01;};
    }
    void step_kanan2 (void) //STEPPER 2 PUTAR KANAN (LENGAN 2)turun
    {
        x2=x2>>1;
        delay_ms(50);
        if (x2==0x08) {x2=0x80;};
    }
    void step_kiri2 (void) //STEPPER 2 PUTAR KIRI (LENGAN 2)naik
    {
        x2=x2<<1;
        delay_ms(50);
        if (x2==0x00) {x2=0x10;};
    }
    void step_kanan3 (void) //STEPPER 3 PUTAR KANAN (KANAN-KIRI)
    {
        x3=x3>>1;
        delay_ms(50);
        if (x3==0x00) {x3=0x08;};
    }
    void step_kiri3 (void) //STEPPER 3 PUTAR KIRI (KANAN-KIRI)
    {
        x3=x3<<1;
        delay_ms(50);
        if (x3==0x10) {x3=0x01;};
    }
    void step_kanan4 (void) //STEPPER 4 PUTAR KANAN (LENGAN KECIL)
    {
        x4=x4>>1;
        delay_ms(50);
        if (x2==0x08) {x2=0x80;};
    }
    void step_kiri4 (void) //STEPPER 4 PUTAR KIRI (LENGAN KECIL)
    {
        x4=x4<<1;
        delay_ms(50);
        if (x2==0x00) {x2=0x10;};
    }
    void dc_jepit1 (void) //DC PENJEPIT (JEPIT)
    {
        PORTB.2=1;
        PORTB.3=0;
        {
            if (PIND.6==1)
                delay_ms(1000);
            PORTB.2=0;
            PORTB.3=0;
        }
    }

    void dc_jepit2 (void) //DC PENJEPIT (BUKA)
    {
        PORTB.2=0;
        PORTB.3=1;
        {
            if (PIND.7==1)
                delay_ms(1000);
            PORTB.2=0;
            PORTB.3=0;
        }
    }
}

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}
void lewat_perempatan (void) //FUNGSI PEREMPATAN
{ while ((PIND.1==1) && (PIND.2==1)) {
    dc_maju();
    };
    perempatan++;

}

void ikuti_garis (void)
{while ((PIND.0==1) && (PIND.1==0) && (PIND.2==0)) {
    dc_maju();}

}

void perempatan_mundur (void)
{while ((PIND.1==1) && (PIND.2==1)) {
    dc_mundur();}
    perempatan++;
}

void perempatan_kanan (void)
{while ((PIND.1==1) && (PIND.2==1)) {
    robot_kanan();}

}

void perempatan_kiri (void)
{while ((PIND.1==1) && (PIND.2==1)) {
    robot_kiri();}

}

void angkat_lengan (void)
{
    for (i=0;i<=15;i++)
    {
        step_kanan1();
        x5=x1|x2;
        PORTA=x5;
    }
    for (i=0;i<=57;i++)
    {
        step_kiri2();
        x6=x2|x1;
        PORTA =x6;
    }
    for (i=0;i<=17;i++)
    {
        step_kanan4();
        x7=x3|x4;
        PORTC =~x7;
    }
    if (PIND.6==1)
    {
        dc_jepit1 ();
    }
}

void turun_lengan (void)
{
    for (i=0;i<=15;i++)
    {
        step_kiril();
        x5=x1|x2;
        PORTA=x5;
    }
    for (i=0;i<=57;i++)
    {
        step_kanan2();

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        x6=x2|x1;
        PORTA =x6;
    }
    for (i=0;i<=17;i++)
    {
        step_kiri4();
        x7=x3|x4;
        PORTB =~x7;
    }
    for (i=0;i<=6;i++)
    {
        step_kanan3();
        x8=x3|x4;
        PORTB =~x8;
    }
    delay_ms(2000);
    dc_jepit2 ();
}
void main(void)
{
    // Declare your local variables here

    // Input/Output Ports initialization
    // Port A initialization
    // 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;
    DDRA=0xFF;

    // Port B initialization
    // 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
    PORTB=0x00;
    DDRB=0xFF;

    // Port C initialization
    // 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
    PORTC=0x00;
    DDRC=0xFF;

    // Port D initialization
    // Func7=In Func6=In Func5=Out Func4=Out Func3=In Func2=In
    Func1=In Func0=In
    // State7=P State6=P State5=0 State4=0 State3=P State2=P State1=P
    State0=P
    PORTD=0x00;
    DDRD=0xFF;

    // Timer/Counter 0 initialization
    // Clock source: System Clock
    // Clock value: Timer 0 Stopped

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// Mode: Normal top=FFh
// OC0 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;
x1=0x01;
x2=0x10;

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```

x3=0x01;
x4=0x10;
x5=0x00;
x6=0x00;
x7=0x00;
x8=0x00;
i=1;
while (1)
{
    // Place your code here

if (PIND.3==0)
{
    delay_ms (1000);
    dc_maju ();
    ikuti_garis ();
    ikuti_garis();
    perempatan_kiri();
    ikuti_garis();
    lewat_perempatan();
    if (perempatan==3)
    {
        perempatan=0;
        angkat_lengan();
        turun_lengan();
        ikuti_garis();
        perempatan_kanan();
        ikuti_garis();
        lewat_perempatan();
    }
    if (perempatan==2)
    {
        perempatan_kiri();
        ikuti_garis();
        lewat_perempatan();
    }
    if (perempatan==4)
    {
        angkat_lengan();
        turun_lengan();
    }
};
}
}
}

```