LAMPIRAN

A. Pembuatan program

```
 /*****************************************************
This program was produced by the
CodeWizardAVR V2.05.0 Professional
Automatic Program Generator
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Project :
Version :
Date    : 11/2/2016
Author  :
Company :
Comments:


Chip type               : ATmega16
Program type            : Application
AVR Core Clock frequency: 1.000000 MHz
Memory model            : Small
External RAM size        : 0
Data Stack size          : 256
*****************************************************/

#include <mega16.h>
#include <delay.h>
#include <stdlib.h>
#include <alcd.h>

eeprom unsigned char save[10]={0,1,2,3,4,5,6,7,8,9};

unsigned char temp[5],temp1[5], bpm=0,input=0, mikrodetik=0, detik=0,
bpm6detik=0;

interrupt [TIM0_OVF] void timer0_ovf_isr(void)
{
// Reinitialize Timer 0 value
TCNT0=0x9E;
mikrodetik++;
if(mikrodetik==10)
{
 detik++;
 if(detik==15)
 {
  detik=0;
  bpm6detik=bpm*4;
  bpm=0;
 }
 mikrodetik=0;
}

}

void set_tombol()
{
```

```c
  if(PIND.0==0)
 {
  lcd_clear();
  input++;
  delay_ms(200);
  if(input>9)
  {input=0;}
 }
 if(PIND.1==0)
 {
 save[input]=bpm6detik;
 }
}
// Declare your global variables here
void tampilan()
{
lcd_gotoxy (0,0);
lcd_putsf("Data");
itoa(input,temp);
lcd_puts(temp);
lcd_putsf(":");
itoa(save[input],temp);
lcd_puts(temp);

lcd_gotoxy(0,1);
lcd_putsf("BPM:");
itoa(bpm6detik,temp1);
lcd_puts(temp1);

if(bpm6detik<10)
{
lcd_gotoxy(5,1);
lcd_putsf("  ");
}
if(bpm6detik>=10&&bpm6detik<100)
{
lcd_gotoxy(6,1);
lcd_putsf(" ");
}
}

void reset_eeprom()
{
if(PIND.2==0)
{
save[0]=0;
save[1]=0;
save[2]=0;
save[3]=0;
save[4]=0;
save[5]=0;
save[6]=0;
save[7]=0;
save[8]=0;
save[9]=0;
lcd_clear();
}
```

```c
}
// Declare your global variables here

void main(void)
{
// Declare your local variables here

// Input/Output Ports initialization
// Port A initialization
// 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
PORTA=0xFF;
DDRA=0x00;

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

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

// Port D initialization
// 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=0x0F;
DDRD=0x00;
// Timer/Counter 0 initialization
// Clock source: System Clock
// Clock value: 0.977 kHz
// Mode: Normal top=0xFF
// OC0 output: Disconnected
TCCR0=0x05;
TCNT0=0x9E;
OCR0=0x00;

// Timer/Counter 1 initialization
// Clock source: System Clock
// Clock value: Timer1 Stopped
// Mode: Normal top=0xFFFF
// OC1A output: Discon.
// OC1B output: Discon.
// Noise Canceler: Off
// Input Capture on Falling Edge
// Timer1 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;
```

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ICR1L=0x00;
OCR1AH=0x00;
OCR1AL=0x00;
OCR1BH=0x00;
OCR1BL=0x00;

// Timer/Counter 2 initialization
// Clock source: System Clock
// Clock value: Timer2 Stopped
// Mode: Normal top=0xFF
// 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=0x01;

// USART initialization
// USART disabled
UCSRB=0x00;

// Analog Comparator initialization
// Analog Comparator: Off
// Analog Comparator Input Capture by Timer/Counter 1: Off
ACSR=0x80;
SFIOR=0x00;

// ADC initialization
// ADC disabled
ADCSRA=0x00;

// SPI initialization
// SPI disabled
SPCR=0x00;

// TWI initialization
// TWI disabled
TWCR=0x00;

// Alphanumeric LCD initialization
// Connections specified in the
// Project|Configure|C Compiler|Libraries|Alphanumeric LCD menu:
// RS - PORTC Bit 0
// RD - PORTC Bit 1
// EN - PORTC Bit 2
// D4 - PORTC Bit 3
// D5 - PORTC Bit 4
// D6 - PORTC Bit 5
```

```c
// D7 - PORTC Bit 6
// Characters/line: 16
lcd_init(16);

// Global enable interrupts
#asm("sei")

while (1)
{
 lcd_gotoxy(15,1);
 lcd_putsf(" ");
 reset_eeprom();
 set_tombol();
 tampilan();

if(PINB.1==0)
{
 bpm++;
 while(PINB.1==0)
  {
  }
 lcd_gotoxy(15,1);
 lcd_putchar(0xDB);
 delay_ms(150);
}


}
}
```

B. Rangkaian keseluruhan