

G.1 Blood pressure code

```
#include <LiquidCrystal.h>
```

```
const int time=5;
```

```
const int sw=8;
```

```
const int precop=2;
```

```
LiquidCrystal lcd(13, 3, 4, 5, 6,7);
```

```
unsigned long Time_s;
```

```
const int numTones = 10;
```

```
const int buz=10;
```

```
int tones[] = {1000, 277, 294, 311, 330, 349, 370, 392, 415, 440};
```

```
const int sens=0;
```

```
const int filter=1;
```

```
const int motor=9;
```

```
const int valve=12;
```

```
void setup() {
```

```
    // put your setup code here, to run once:
```

```
    Serial.begin(9600);
```

```
    lcd.begin(16,4);
```

```
    pinMode(buz,OUTPUT);
```

```
    pinMode(valve,OUTPUT);
```

```
    pinMode(motor,OUTPUT);
```

```
    pinMode(time,INPUT);
```

```
    pinMode(precop,INPUT);
```

```
    pinMode(filter,INPUT);
```

```
    pinMode(sw,INPUT);
```

```
    lcd.setCursor(0,0);
```

```
    lcd.print("Welcome..");
```

```
    delay(2000);
```

```
    lcd.clear();
```

```
    lcd.setCursor(0,0);
```

```
    lcd.write("please set the ");
```

```
    lcd.setCursor(0,1);
```

```
    lcd.write("Time Interval..");
```

```
lcd.setCursor(0,3);
lcd.write("TIME= ");
int count1=0;
int sw_State=digitalRead(sw);
while(sw_State==0){
  lcd.clear();
  lcd.setCursor(0,0);
  lcd.write("please set the ");
  lcd.setCursor(0,1);
  lcd.write("Time Interval..");
  lcd.setCursor(0,3);
  lcd.write("TIME= ");

  sw_State=digitalRead(sw);
  int TIME=analogRead(time);
  int Time=map(TIME,0,1023,2,60);
  lcd.setCursor(6,3);
  lcd.print(Time);
```

```
Time_s=Time;
  lcd.blink();
  delay(100);
}
count1++;
  lcd.noBlink();
```

```
lcd.clear();
lcd.print("Time Interval is");
lcd.setCursor(0,1);
lcd.print("set to ");
lcd.setCursor(7,1);
lcd.print(Time_s);
lcd.setCursor(10,1);
lcd.write("mins");
lcd.blink();
delay(5000);
lcd.clear();
lcd.setCursor(0,0);
lcd.print("get ready and ");
```

```

lcd.setCursor(0,1);
lcd.print("press the button");
delay(100);
while(count1==1){
int sw_State=digitalRead(sw);
if(sw_State)
count1++;

}
lcd.clear();
lcd.noBlink();
lcd.setCursor(0,0);
lcd.write("Starting....");
lcd.setCursor(0,1);
lcd.write("Don't Move!!");
Time_s=Time_s*60*1000;
tone1();

}

void loop() {
int c=0;int pre;int filterVal;int sys;int precopRead;int dia;int d=0;

lcd.clear();
digitalWrite(valve,HIGH);
inflate();
lcd.clear();
while(c==0)
{
    filterVal=analogRead(filter);

if(filterVal>=600)
{

    pre=analogRead(sens);
pre=Pressure(pre);
sys=pre;

    c++;

```

```

}
  lcd.clear();

  pre=analogRead(sens);
  pre=Pressure(pre);
  lcd.print("pressureVal= ");
  lcd.print(pre);

}
tone_sys();
lcd.clear();
lcd.print("sys is measured");
delay(4000);
while(d==0){
  lcd.clear();
  pre=analogRead(sens);
  pre=Pressure(pre);
  lcd.print("pressureVal= ");
  lcd.print(pre);
  precopRead=analogRead(precop);
  if (precopRead>=150){
    pre=analogRead(sens);
    pre=Pressure(pre);

    dia=pre;
    d++;
    tone_dia();
    lcd.clear();
    lcd.print("dia is measured");

  }
}
pre=analogRead(sens);
pre=Pressure(pre);

while(pre>60)
{ lcd.clear();
  pre=analogRead(sens);
  pre=Pressure(pre);

```

```

    lcd.print("pressureVal= " );
    lcd.print(pre);
    delay(100);
    digitalWrite(valve,LOW);

}
tone_done();
lcd.clear();
lcd.setCursor(0,0);
lcd.print("systolic= ");
lcd.print(sys);
lcd.setCursor(0,1);
lcd.print("diastolic= ");
lcd.print(dia);

delay(Time_s);

}

```

//inflating Motor

```

void inflate()
{
    int filterVal=analogRead(filter);

    Serial.println(filterVal);

    int vall=analogRead(sens);
    int pressurev=Pressure(vall);
    lcd.setCursor(0, 0);
    lcd.print("pressureVal= " );
    lcd.print(pressurev);

    while(pressurev<=220){
        lcd.clear();
        filterVal=analogRead(filter);

        Serial.println(filterVal);
    }
}

```

```

        int vall=analogRead(sens);
        pressurev=Pressure(vall);
        digitalWrite(motor,HIGH);
        lcd.setCursor(0, 0);
        lcd.print("pressureVal= " );
        lcd.print(pressurev);
        lcd.setCursor(0, 2);
        delay(50);

    }
    digitalWrite(motor,LOW);

}

```

```

int Pressure(int pressure){

    float val1=pressure*(5.0/1024);
    float val2=val1-0.19;
    if (val2<0)
        val2=0.0;
    float val3=val2*(750.0/4.60);
    int val4=int(val3);

    return val4;

}

```

// BPF code=====

```

int filtervalue(){
    int pr=analogRead(filter);
    return pr;
}

```

```

void tone1()

```

```
{  
    tone(buz,tones[6]);  
    delay(500);  
    noTone (buz);  
    delay(500);  
    tone(buz,tones[6]);  
    delay(500);  
    noTone (buz);  
    delay(500);  
    tone(buz,tones[1]);  
    delay(500);  
    noTone (buz);  
}
```

```
void tone_sys(){  
  
    tone(buz,tones[4]);  
    delay(500);  
    noTone (buz);  
}
```

```
void tone_dia(){  
  
    tone(buz,tones[6]);  
    delay(500);  
    noTone (buz);  
}  
void tone_done(){  
  
    tone(buz,tones[9]);  
    delay(500);  
    tone(buz,tones[10]);  
    delay(500);  
    noTone (buz);  
  
}
```