

```
int UpperThreshold = 900; //Thresholding of where to read "beats" based on your signal input
int LowerThreshold = 800; // Lower threshold to rid the reading of P and T sections of the wave
```

```
// Initialize Readings to Zero
```

```
int reading = 0;
```

```
int BPM = 0;
```

```
bool IgnoreReading = false;
```

```
bool FirstPulseDetected = false;
```

```
unsigned long FirstPulseTime = 0;
```

```
unsigned long SecondPulseTime = 0;
```

```
unsigned long PulseInterval = 0;
```

```
#define LED 13
```

```
void setup(){
```

```
  Serial.begin(74880); // begin serial monitoring with a baud rate of 74880 pulses per second
```

```
  pinMode(LED, OUTPUT);
```

```
}
```

```
//Creates a loop to calculate pulse interval for unfiltered signals
```

```
void loop(){
```

```
  reading = analogRead(A0);
```

```
  // Heart beat leading edge detected.
```

```
  if(reading > UpperThreshold && IgnoreReading == false){
```

```
    if(FirstPulseDetected == false){
```

```
      FirstPulseTime = millis();
```

```
      FirstPulseDetected = true;
```

```
    }
```

```
  else{
```

```

    SecondPulseTime = millis();

    PulseInterval = SecondPulseTime - FirstPulseTime;

    FirstPulseTime = SecondPulseTime;
}

IgnoreReading = true;
}

// Heart beat trailing edge detected.
if(reading < LowerThreshold && reading > 2){
    IgnoreReading = false;
}

if(reading > LowerThreshold && reading < UpperThreshold)
{
    digitalWrite(LED, HIGH);
}
else
{
    digitalWrite(LED, LOW);
}

// Calculation for BPM based on pulse interval
BPM = (1.0/PulseInterval) * 60.0 * 1000;
//Serial.println(A0);
Serial.print("BPM = ");
Serial.println(BPM);
delayMicroseconds(3900);
{

```

```
// read the input on analog pin 0:
int sensorValue = analogRead(A0);
// Convert the analog reading (which goes from 0 - 1023) to a voltage (0 - 5V):
float voltage = sensorValue/1023*5;
// read the input on analog pin 0:
//int sensorValue = analogRead(A0);
// Convert the analog reading (which goes from 0 - 1023) to a voltage (0 - 5V):

// print out the value you read:
//Serial.println(voltage);
};
// print out the value you read:
//Serial.println(voltage);
}
```