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int UpperThreshold = 120; //upper threshold of where to read beats based on our signal input
int LowerThreshold = 100; //lower threshold of where to read "beats based on our signal input
int reading = 0; // sets the inital reading to 0
int BPM = 0; // sets the initial BPM to 0
bool IgnoreReading = false; // used to determine if the reading is acceptable within the
threshold
bool FirstPulseDetected = false; // used to determine if the pulse has been detected
unsigned long FirstPulseTime = 0; // sets the initial pulse time to 0
unsigned long SecondPulseTime = 0; // sets the second pulse time to 0
unsigned long PulseInterval = 0; // sets the pulse interval to 0

// sets up the program for data collection and LED outputs
void setup()
{
  Serial.begin(74880); // sets the data rate in bits per second, or baud, of the data transmission
}

// loops through the pulses
void loop()
{
  reading = analogRead(A0); // sets the input reading to be pin A0.
  // Heart beat leading edge detected.
  if(reading > UpperThreshold && IgnoreReading == false)
  {
    // pulse has not been detected
    if(FirstPulseDetected == false)
    {
      FirstPulseTime = millis(); // the number of milliseconds that has passed since it began
      FirstPulseDetected = true; // set to true in order to begin collecting the data
    }

    // pulse has been detected
    else
    {
      SecondPulseTime = millis(); // the number of milliseconds that has passed since it began
      PulseInterval = SecondPulseTime - FirstPulseTime; // calculates difference to get the pulse
interval
      FirstPulseTime = SecondPulseTime; // sets the first pulse time equal to the next to continue
the process
    }
  }
}

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    IgnoreReading = true; // true since the value is not within the threshold
}

// Heart beat trailing edge detected.
if(reading < LowerThreshold && reading > 2)
{
    IgnoreReading = false; // false since the value is not within the threshold
}

BPM = (1.0/PulseInterval) * 60.0 * 1000; // Calculates the BPM based on the input
//Serial.println(A0);
Serial.print("BPM = "); // print statement
//Serial.println(BPM); // prints the BPM amount
delayMicroseconds(3900); // delays the next step by 3900 ms.
{

// 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;
{
// 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);
}
}

```