

# SMART WATCH

How is it different?

- Collects raw data from user and stores it in an excel file
- The excel file is deployed on a **python** script which runs **Data Analytics** on it
- The raw data is now turned into a source of health information of the user
- Dependencies:
  - 1)Arduino UNO
  - 2)AQI Sensor
  - 3)Alcohol Sensor
  - 4)Pulse Sensor
  - 5)Temperature Sensor

# WORKING OF EACH SENSOR

## MQ-135(gas sensor)

- The MQ-135 gas sensor that senses the gases like ammonia, nitrogen, oxygen, aromatic compounds, sulfide and smoke.
- The operating voltage of this gas sensor is from 2.5V to 5.0V.
- In the atmosphere we can find polluting gases, but the conductivity of gas sensor increases as the concentration of polluting gas increases.
- MQ-135 gas sensor can be implemented to detect the smoke, benzene, steam and other harmful gases.
- It has potential to detect different harmful gases.

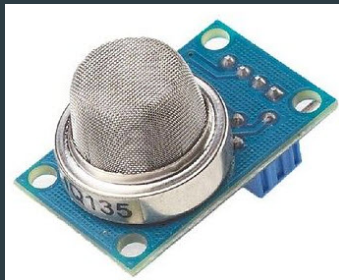


Fig: Gas Sensor

## MQ-3(alcohol sensor)

- Sensitive material of MQ-3 gas sensor is  $\text{SnO}_2$ , which with lower conductivity in clean air
- When the target alcohol gas exist, The sensor's conductivity is more higher along with the gas concentration rising.
- MQ-3 gas sensor has high sensitivity to Alcohol, and has good resistance to disturb of gasoline, smoke and vapor.
- The sensor could be used to detect alcohol with different concentration, it is with low cost and suitable for different application.



Fig: Alcohol Sensor

## PULSE SENSOR

- The sensor consists of a super bright red LED and light detector.
- The LED needs to be super bright as the maximum light must pass spread in finger and detected by detector.
- Now, when the heart pumps a pulse of blood through the blood vessels, the finger becomes slightly more opaque and so less light reached the detector.
- With each heart pulse the detector signal varies. This variation is converted to electrical pulse.
- This signal is amplified and triggered through an amplifier which outputs +5V logic level signal.
- The output signal is also indicated by a LED which blinks on each heart beat.



Fig: Pulse Sensor

## MPU6050

- It is used to measure room temperature in this project.
- On-chip temperature sensor output is digitized using ADC. The reading from temperature sensor can be read from sensor data register.
- Temperature sensor data of MPU6050 module consists of 16-bit data.

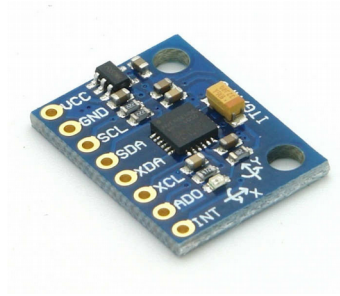
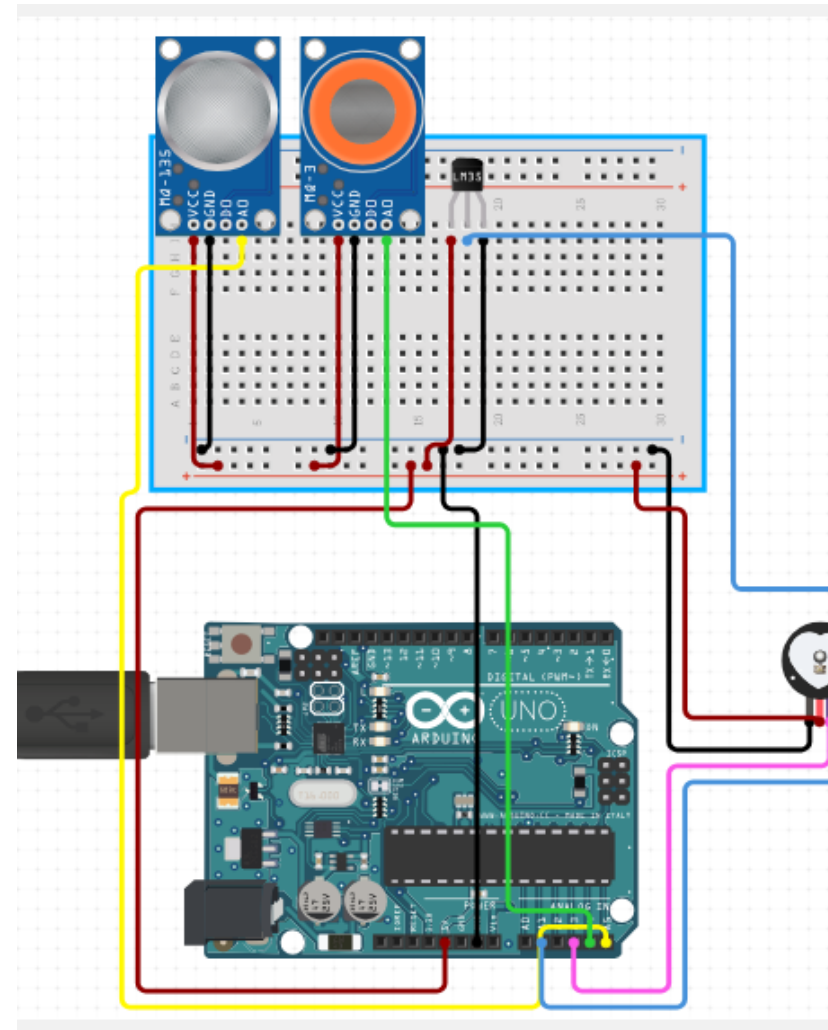


Fig: MPU6050

# Circuit Diagram

## MATERIALS USED

- ▶ ARDUINO
- ▶ PULSE RATE SENSOR
- ▶ MQ-135
- ▶ MQ-3
- ▶ MPU6050

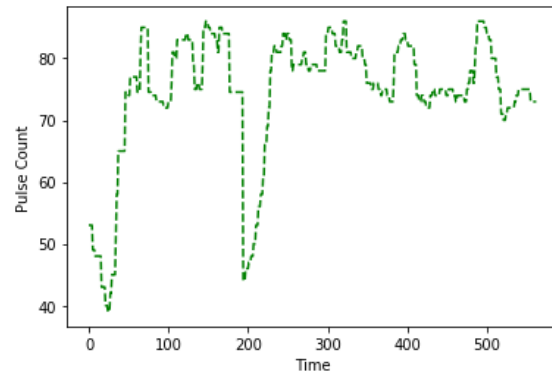


## Data Analytics and how it works

We will be using a CSV file that contains the output of the sensor values of the watch. The CSV file is then opened on Python using Pandas and the plot of the heartbeat is plotted using matplotlib.

```
In [1]: runfile('C:/Users/91935/healthwatch.py', wdir='C:/Users/91935')
```

	Time	Alcohol Value	BPM	Smoke Sensor	Temperature
0	02:19:55	194	53	207	43.17
1	02:19:55	195	53	206	43.08
2	02:19:56	195	53	205	43.21
3	02:19:56	194	53	205	43.32
4	02:19:56	194	53	205	42.97



```
In [2]:
```

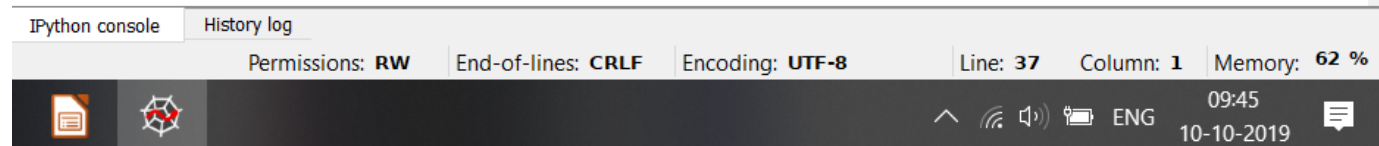


Fig: Output of Python Script