A Gyroscope gives the values of Angular Velocity (degrees/sec) in the three respective axis (Yaw, Pitch and Roll axes respectively).

But whatever **raw** value given first by these sensors should be converted to sensible acceleration or angular velocity values by scaling.

InvenSense Data Sheet of MPU-6050 says that we have to use different scaling factors for different ranges of gyro values. **I shall explain how to use these scaling factors in the end.**

Angular Velocity Limit	Sensitivity
250º/s	131
500º/s	65.5
1000º/s	32.8
2000º/s	16.4

Similarly , for Accelerometer (which gives x,y,z axes acceleration including gravity) the unit used is g ($9.81 \frac{m}{s^2}$ 9.81ms2).

Scaling factors for accelerometer values :

Acceleration Limit	Sensitivity
2g	16,384
4g	8,192
8g	4,096
16g	2,048

Converting the raw data :

$$\text{required\_value} = \frac{\text{raw\_value}}{\text{proper\_sensitivity}}$$ required_value=raw_valueproper_sensitivity

For example , in the first data , you got

```
accel x,y,z: 1944, 368, 15608
gyro x,y,z : -34, -204, -247
```

Acceleration seems to be in the limit of 2g. So, scaling factor = 16384

implies $\text{ax} = \frac{1944}{16384} \text{g}$ ax=194416384g

Gyro seems to be in the limit of $\frac{250^o}{s}$ 250ºs. So, scaling factor or sensitivity = 131

implies $\text{gyro\_value} = \frac{-34}{131} \frac{\text{degrees}}{\text{sec}}$ gyro_value=−34131degreessec

Hope that helps. :)