GROUP 12

MPU 6050: ACCELEROMETER & GYROSCOPE

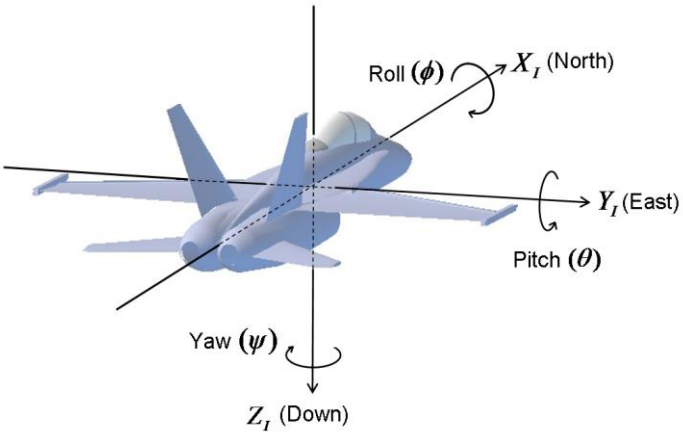
MUHAMMAD FAISAL EL-MUHAMMADY BIN MOHAMAD SALAH (1617445)

ABDULLAH ALI AL-AHDAL (1515481)

KHADIJAH BINTI AMIR (1622922)

Overview:

MPU 6050 sensor contains a MEMS accelerometer, MEMS gyroscope and a thermometer in a single chip. It contains a 16-bits analog to digital conversion hardware for each channel. Hence, this allows the excess of x,y and z data at the same time. This sensor uses I2C-bus to interface it with Arduino. Thus, in the code we use the Wire.h library for the communication between the master and the slave. The MPU-6050 always acts as a slave to the Arduino with the SDA and SCL pins connected to the I2C bus. The I2C address for this sensor is 0x68.

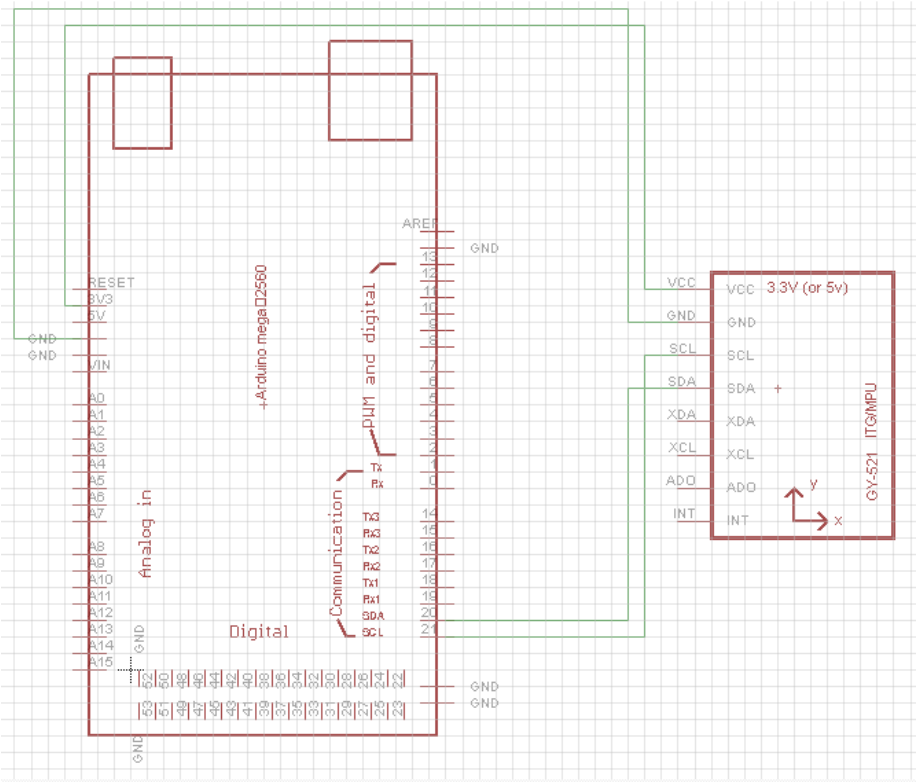


The concept on how gyroscope works can be understood by the picture above.

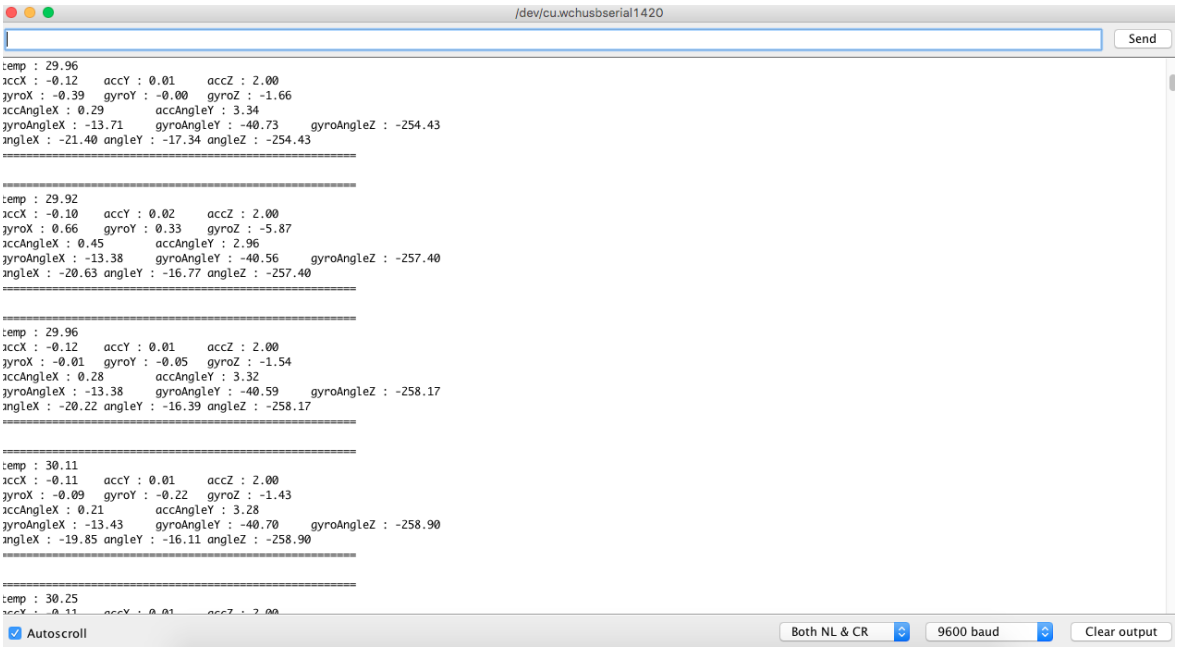
Coding:

```
#include <MPU6050_tockn.h>
#include <Wire.h>

MPU6050 mpu6050(Wire);

void setup() {
  Serial.begin(9600);
  Wire.begin();
  mpu6050.begin();
  mpu6050.calcGyroOffsets(true);
}
void loop() {
  mpu6050.update();
    Serial.println("=======================================================");
    Serial.print("temp : ");Serial.println(mpu6050.getTemp());
    Serial.print("accX : ");Serial.print(mpu6050.getAccX());
    Serial.print("\taccY : ");Serial.print(mpu6050.getAccY());
    Serial.print("\taccZ : ");Serial.println(mpu6050.getAccZ());

    Serial.print("gyroX : ");Serial.print(mpu6050.getGyroX());
    Serial.print("\tgyroY : ");Serial.print(mpu6050.getGyroY());
    Serial.print("\tgyroZ : ");Serial.println(mpu6050.getGyroZ());

    Serial.print("accAngleX : ");Serial.print(mpu6050.getAccAngleX());
    Serial.print("\taccAngleY : ");Serial.println(mpu6050.getAccAngleY());

    Serial.print("gyroAngleX : ");Serial.print(mpu6050.getGyroAngleX());
    Serial.print("\tgyroAngleY : ");Serial.print(mpu6050.getGyroAngleY());
    Serial.print("\tgyroAngleZ : ");Serial.println(mpu6050.getGyroAngleZ());

    Serial.print("angleX : ");Serial.print(mpu6050.getAngleX());
    Serial.print("\tangleY : ");Serial.print(mpu6050.getAngleY());
    Serial.print("\tangleZ : ");Serial.println(mpu6050.getAngleZ());
    Serial.println("=======================================================\n");

    delay (200);
  }
```

Schematic Diagram:



Result:



The temperate output is in degree celcius, acceleration is in m/s^2,gyrometer is in degree/s, and angular reading is in degree.