

-Cause the MPU use i2c communication we use the library :

```
#include "Wire.h"
```

-First set the address and the value:

```
const int MPU_address = 0x68
```

identify the variables

```
int16_t gyro_x, gyro_y, gyro_z;
```

cause all the registers are 8 bits we need to convert them to 16 bits

to store the values of the registers

```
char tmp_str[7]; // temporary variable used in convert function
```

-function to convert the registers

```
char* convert_int16_to_str(int16_t i) { // converts int16 to string. Moreover, resulting strings will have the same length in the debug monitor.
```

```
    sprintf(tmp_str, "%6d", i);
```

```
    return tmp_str;
```

```
}
```

Start the i2c communication

```
Wire.begin();
```

Set the address and value

```
Wire.beginTransmission(MPU_address); // Begins a transmission to the I2C slave (GY-521 board)
```

```
Wire.write(0x6B); // set the address
```

```
Wire.write(0); // set to zero (the value)
```

-Check that the communication is not still exist

```
Wire.endTransmission(true);
```

-start the transmission

```
Wire.beginTransmission(MPU_address);
```

```
Wire.write(0x3B); // starting with register 0x3B
```

-Check that the communication is not still exist

```
Wire.endTransmission(false); // indicate that the transmission is still exist
```

-to know that we recived data from 2 registers

```
Wire.requestFrom(MPU_address, 2*2, true); // request a total of 2*2=4 registers
```

-to store data in low bits registers then shift it to store the high bits

```
gyro_x = Wire.read()<<8 | Wire.read(); // reading registers: 0x43
```

```
gyro_y = Wire.read()<<8 | Wire.read(); // reading registers: 0x45
```

```
gyro_z = Wire.read()<<8 | Wire.read(); // reading registers: 0x47
```

-//check that the pitch or roll angles exceeds 60 degrees then turn on the led

```
if ((convert_int16_to_str(gyro_x)|convert_int16_to_str(gyro_y))>60 {
```

```
    digitalWrite(led,HIGH); //if the angel exceeds 60 degree so the led will turned on
```

```
    delay(1000);
```

```
}
```

```
else
```

```
{
```

```
    digitalWrite(led,LOW); //if the angel doesn't exceed 60 degree so the led will turned off
```

```
    delay(1000);}
```

```
}
```