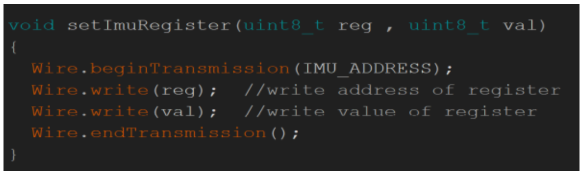
RON’S BROOMSTICK

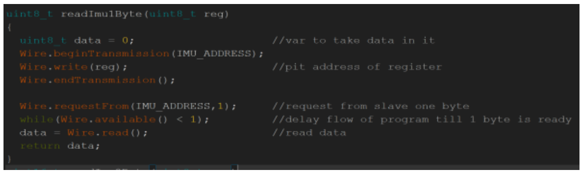
FLOW OF CODE

- Define Wire library to I2C
- Implement functions of IMU
- Implement Calibration function
- Setup IMU specifications
- Loop:
    1. If angles   > 60 LED is ON
    2. Else angles < 60 LED is OFF

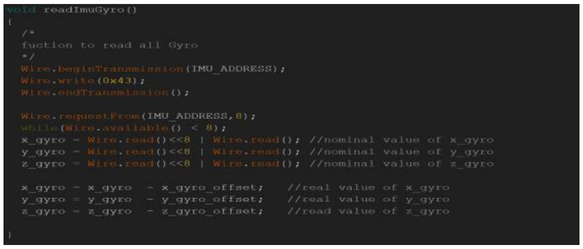
SPECICATION FUNCTION



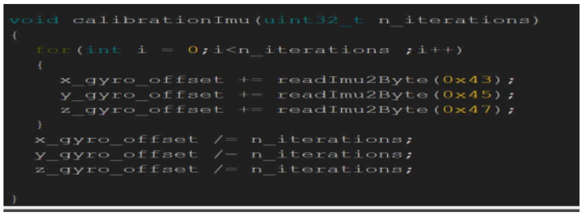
```
void setImuRegister(uint8_t reg , uint8_t val)
{
  Wire.beginTransmission(IMU_ADDRESS);
  Wire.write(reg);  //write address of register
  Wire.write(val);  //write value of register
  Wire.endTransmission();
}
```



```
uint8_t readImu1Byte(uint8_t reg)
{
  uint8_t data = 0;                      //var to take data in it
  Wire.beginTransmission(IMU_ADDRESS);
  Wire.write(reg);                       //pit address of register
  Wire.endTransmission();

  Wire.requestFrom(IMU_ADDRESS,1);       //request from slave one byte
  while(Wire.available() < 1);           //delay flow of program till 1 byte is ready
  data = Wire.read();                    //read data
  return data;
}
```

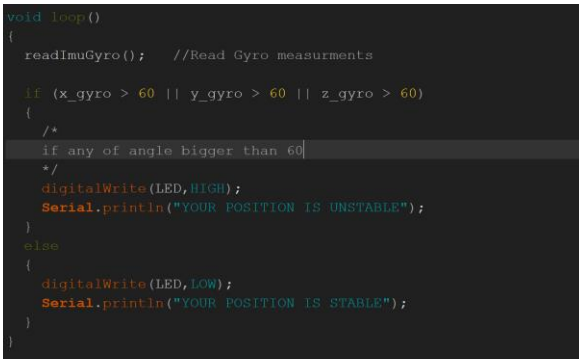


```
void readImuGyro()
{
  /*
  fuction to read all Gyro
  */
  Wire.beginTransmission(IMU_ADDRESS);
  Wire.write(0x43);
  Wire.endTransmission();

  Wire.requestFrom(IMU_ADDRESS,8);
  while(Wire.available() < 8);
  x_gyro = Wire.read()<<8 | Wire.read(); //nominal value of x_gyro
  y_gyro = Wire.read()<<8 | Wire.read(); //nominal value of y_gyro
  z_gyro = Wire.read()<<8 | Wire.read(); //nominal value of z_gyro

  x_gyro = x_gyro  - x_gyro_offset;   //real value of x_gyro
  y_gyro = y_gyro  - y_gyro_offset;   //real value of y_gyro
  z_gyro = z_gyro  - z_gyro_offset;   //read value of z_gyro

}
```



```
void calibrationImu(uint32_t n_iterations)
{
  for(int i = 0;i<n_iterations ;i++)
  {
    x_gyro_offset += readImu2Byte(0x43);
    y_gyro_offset += readImu2Byte(0x45);
    z_gyro_offset += readImu2Byte(0x47);
  }
  x_gyro_offset /= n_iterations;
  y_gyro_offset /= n_iterations;
  z_gyro_offset /= n_iterations;

}
```

LOOPED OPERATIONS



```
void loop()
{
  readImuGyro();   //Read Gyro measurments

  if (x_gyro > 60 || y_gyro > 60 || z_gyro > 60)
  {
    /*
    if any of angle bigger than 60
    */
    digitalWrite(LED,HIGH);
    Serial.println("YOUR POSITION IS UNSTABLE");
  }
  else
  {
    digitalWrite(LED,LOW);
    Serial.println("YOUR POSITION IS STABLE");
  }
}
```

NOTES

- I am not sure about measure of angles
- I take sure that code is well-commented
- Code is running well

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