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// Written by Michael Welsh, September 13, 2017
//
// This code is intended to complete a test demonstration for the MPU6050 Motion Sensor
// It will read the registers containing Acceleration, Temperature, and Gyro Data
// using the Arduino Wire library for I2C communications.
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// MPU6050 I2C address defined by ADO pin. ADO pin is set to GND.
// GND = 1101000 VCC = 1101001
int mpu6050_address = 104; //decimal for 1101000

int16_t AcX,AcY,AcZ,Tmp,GyX,GyY,GyZ; //16 bit integer with width = 16 bits ALWAYS
#include <Wire.h>

void setup() {
// Start serial communications to computer display
Serial.begin(9600);

// Create a Wire object
Wire.begin();
Wire.beginTransmission(mpu6050_address);
Wire.write(0x6B); // PWR_MGMT_1 register
Wire.write(0); // set to zero (wakes up the MPU6050)
Wire.endTransmission(true); //true=release bus connection from master
}

void loop(){
// Moving to next register to take action on
Wire.beginTransmission(mpu6050_address);
Wire.write(0x3B); // starting with ACCEL_XOUT_H register
Wire.endTransmission(false); //false=keep bus connection active with master

// Request MPU6050 send data. Create 16 bit integer.
Wire.requestFrom(mpu6050_address,14,true); // send 14 bytes, release bus when complete
AcX=Wire.read()<<8|Wire.read(); // 0x3B (ACCEL_XOUT_H) & 0x3C (ACCEL_XOUT_L)
AcY=Wire.read()<<8|Wire.read(); // 0x3D (ACCEL_YOUT_H) & 0x3E (ACCEL_YOUT_L)
AcZ=Wire.read()<<8|Wire.read(); // 0x3F (ACCEL_ZOUT_H) & 0x40 (ACCEL_ZOUT_L)
Tmp=Wire.read()<<8|Wire.read(); // 0x41 (TEMP_OUT_H) & 0x42 (TEMP_OUT_L)
GyX=Wire.read()<<8|Wire.read(); // 0x43 (GYRO_XOUT_H) & 0x44 (GYRO_XOUT_L)
GyY=Wire.read()<<8|Wire.read(); // 0x45 (GYRO_YOUT_H) & 0x46 (GYRO_YOUT_L)
GyZ=Wire.read()<<8|Wire.read(); // 0x47 (GYRO_ZOUT_H) & 0x48 (GYRO_ZOUT_L)
delay(500);

// Display data to the serial display
Serial.print("AcX = "); Serial.print(AcX);
Serial.print(" | AcY = "); Serial.print(AcY);

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Serial.print(" | AcZ = "); Serial.print(AcZ);  
Serial.print(" | Tmp = "); Serial.print(Tmp/340.00+36.53); //equation for temperature in degrees C  
from datasheet  
Serial.print(" | GyX = "); Serial.print(GyX);  
Serial.print(" | GyY = "); Serial.print(GyY);  
Serial.print(" | GyZ = "); Serial.println(GyZ);  
}
```