ISL | Arduino IDE 2.3.6

File Edit Sketch Tools Help

ESP32 Dev Module

ISL.ino

```ino
#include <Wire.h>
// --- MPU6050 Setup ---
#define MPU_ADDR 0x68 // MPU6050 I2C address
int16_t ax, ay, az, gx, gy, gz; // Global variables to store IMU data

// --- Flex Sensor Setup ---
const int FLEX_PIN_1 = 32; // F1
const int FLEX_PIN_2 = 33; // F2
const int FLEX_PIN_3 = 34; // F3
const int FLEX_PIN_4 = 35; // F4
const int FLEX_PIN_5 = 36; // F5

int f1, f2, f3, f4, f5;

void setup() {
  Serial.begin(115200);

  // --- MPU6050 Init ---
  Wire.begin(21, 22); // I2C pins (SDA, SCL)

  // MPU6050 ko 'wake up' karein
  Wire.beginTransmission(MPU_ADDR);
  Wire.write(0x6B); // PWR_MGMT_1 register
  Wire.write(0);    // 0 likhkar 'wake up' karein
  Wire.endTransmission(true);
  Serial.println("f1,f2,f3,f4,f5,ax,ay,az,gx,gy,gz");
}

//================================================================
// LOOP FUNCTION (Baar baar chalta hai)
//================================================================
void loop() {

  // Step 1: Flex sensors se data read karein
  readFlexSensors();

  // Step 2: IMU se data read karein
  readIMU();

  // Step 3: Saara data Serial par print karein
  printDataCSV();

  // 50ms ka delay (aap 20 readings per second le rahe hain)
  // Yeh gesture capture ke liye acchi speed hai.
  delay(50);
}

//================================================================
```

```
/*
 * Function: readFlexSensors
 * -------------------------
 * 5 flex sensors se analog values read karke global variables
 * (f1, f2, f3, f4, f5) mein store karta hai.
 */
void readFlexSensors() {
  f1 = analogRead(FLEX_PIN_1);
  f2 = analogRead(FLEX_PIN_2);
  f3 = analogRead(FLEX_PIN_3);
  f4 = analogRead(FLEX_PIN_4);
  f5 = analogRead(FLEX_PIN_5);
}


/*
 * Function: readIMU
 * -----------------
 * MPU6050 (IMU) se I2C ke zariye 6 values (ax,ay,az,gx,gy,gz)
 * read karke global variables mein store karta hai.
 */
void readIMU() {
  // MPU6050 se 14 bytes data maangein
  Wire.beginTransmission(MPU_ADDR);
  Wire.write(0x3B); // ACCEL_XOUT_H register se shuru karein
  Wire.endTransmission(false);
  Wire.requestFrom(MPU_ADDR, 14, true); // 14 bytes read karein

  // Bytes ko 16-bit integers (int16_t) mein convert karein
  ax = Wire.read() << 8 | Wire.read();
  ay = Wire.read() << 8 | Wire.read();
  az = Wire.read() << 8 | Wire.read();
  Wire.read(); Wire.read(); // 2 byte temperature ko skip karein
  gx = Wire.read() << 8 | Wire.read();
  gy = Wire.read() << 8 | Wire.read();
  gz = Wire.read() << 8 | Wire.read();
}


/*
 * Function: printDataCSV
 * ----------------------
 * Saare global sensor variables (11 values) ko ek single
 * CSV (Comma Separated Value) line mein print karta hai.
 */
void printDataCSV() {
  // Format: f1,f2,f3,f4,f5,ax,ay,az,gx,gy,gz

  // Flex Data
  Serial.print(f1);
  Serial.print(",");
  Serial.print(f2);
  Serial.print(",");
```

```
/*
 * Function: printDataCSV
 * ----------------------
 * Saare global sensor variables (11 values) ko ek single
 * CSV (Comma Separated Value) line mein print karta hai.
 */
void printDataCSV() {
  // Format: f1,f2,f3,f4,f5,ax,ay,az,gx,gy,gz

  // Flex Data
  Serial.print(f1);
  Serial.print(",");
  Serial.print(f2);
  Serial.print(",");
  Serial.print(f3);
  Serial.print(",");
  Serial.print(f4);
  Serial.print(",");
  Serial.print(f5);
  Serial.print(",");

  // IMU Data
  Serial.print(ax);
  Serial.print(",");
  Serial.print(ay);
  Serial.print(",");
  Serial.print(az);
  Serial.print(",");
  Serial.print(gx);
  Serial.print(",");
  Serial.print(gy);
  Serial.print(",");
  Serial.println(gz); // println se line khatam hoti hai
}
```

Serial Monitor ×

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```
 * read karke global variables mein store karta hai.
 */
void readIMU() {
  // MPU6050 se 14 bytes data maangein
  Wire.beginTransmission(MPU_ADDR);
```

Output Serial Monitor ×

Message (Enter to send message to 'ESP32 Dev Module' on 'COM5')

```
1686,1886,4095,4095,1530,-10340,11888,-4676,457,890,26
1684,1889,4095,4095,183,-10252,11940,-4648,449,919,3
1688,1887,4095,4095,895,-10252,11860,-4484,452,927,7
1690,1889,4095,4095,370,-10224,11876,-4608,419,900,14
1687,1890,4095,4095,119,-10276,11900,-4528,490,951,129
1648,1888,4095,4095,1517,-10248,11848,-4584,332,888,-41
1685,1889,4095,4095,183,-10204,11828,-4604,371,920,-30
1685,1887,4095,4095,875,-10276,11880,-4676,460,905,0
1689,1890,4095,4095,368,-10220,11852,-4688,455,884,35
1689,1889,4095,4095,123,-10236,11868,-4584,413,898,-1
1687,1890,4095,4095,1511,-10212,11940,-4680,453,917,-3
1689,1890,4095,4095,186,-10216,11924,-4524,437,876,15
1685,1889,4095,4095,848,-10112,12096,-4440,-166,588,-226
1687,1891,4095,4095,353,-10160,11928,-4560,-61,556,-284
1687,1891,4095,4095,125,-9992,11928,-4532,-39,723,-179
1687,1890,4095,4095,1490,-10044,11888,-4648,-29,906,-73
1690,1890,4095,4095,187,-10152,11880,-4572,137,893,-30
1687,1887,4095,4095,803,-10236,11868,-4548,328,843,-33
1689,1892,4095,4095,345,-10256,11940,-4704,434,914,-44
1687,1890,4095,4095,128,-10248,11880,-4648,458,886,21
```