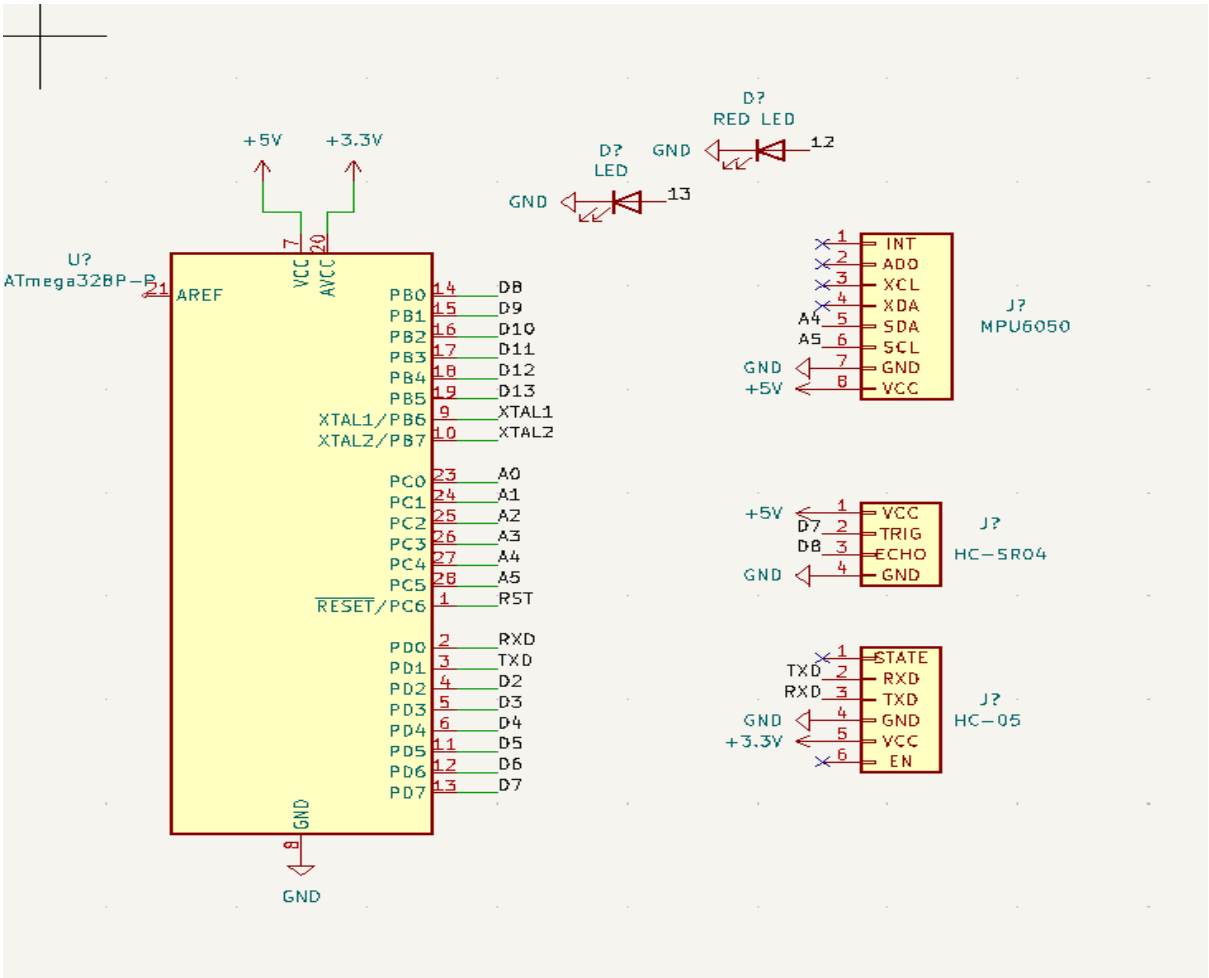
Ultrasonic HC-SR04 , Bluetooth HC-05 and MPU6050 sensor Project Basic Function Report

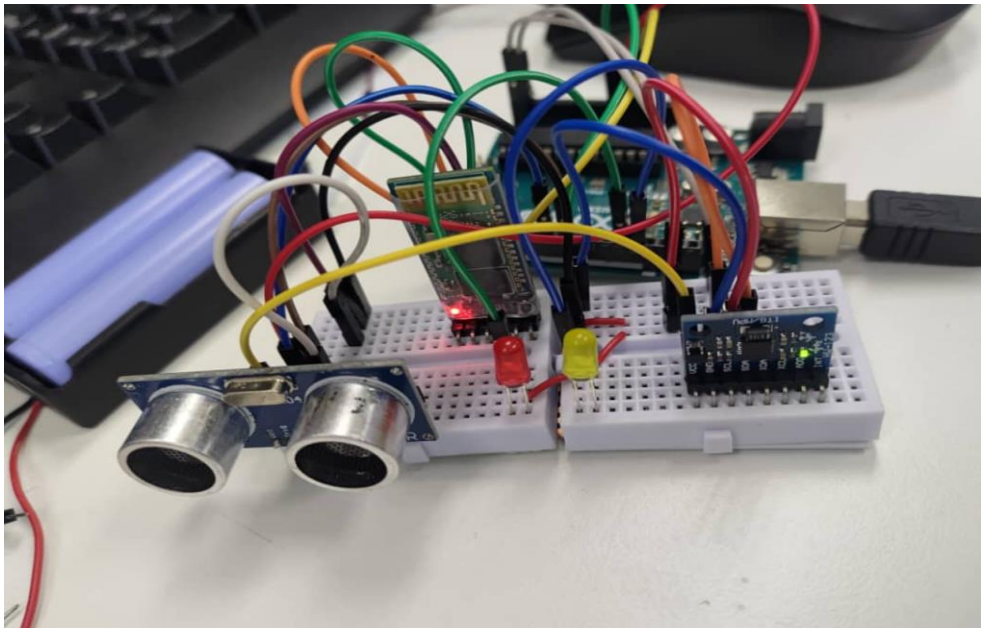
Intro:

- This project call Bluetooth communication with the installation of Ultrasonic sensor and Gyro & Accelerometer.
- Sort of code enable the communication between an Arduino Board and Bluetooth module.
- Also it incorporates with an ultrasonic sensor to measure the distance and a gyro & accelerometer is to measure rotation in x, y and z axis.
- Arduino board receive the commands via Bluetooth and perform those action (applicable in separate Bluetooth circuit).
- Image snip below show the 2d circuit connection design consist of:
  - ✓ Mpu6050 accelerometer & gyro
  - ✓ HC-SR04 Ultrasonic
  - ✓ LED red and yellow
  - ✓ HC-05 Bluetooth
  - ✓ Arduino Uno
- The Pin Connection: showed below:

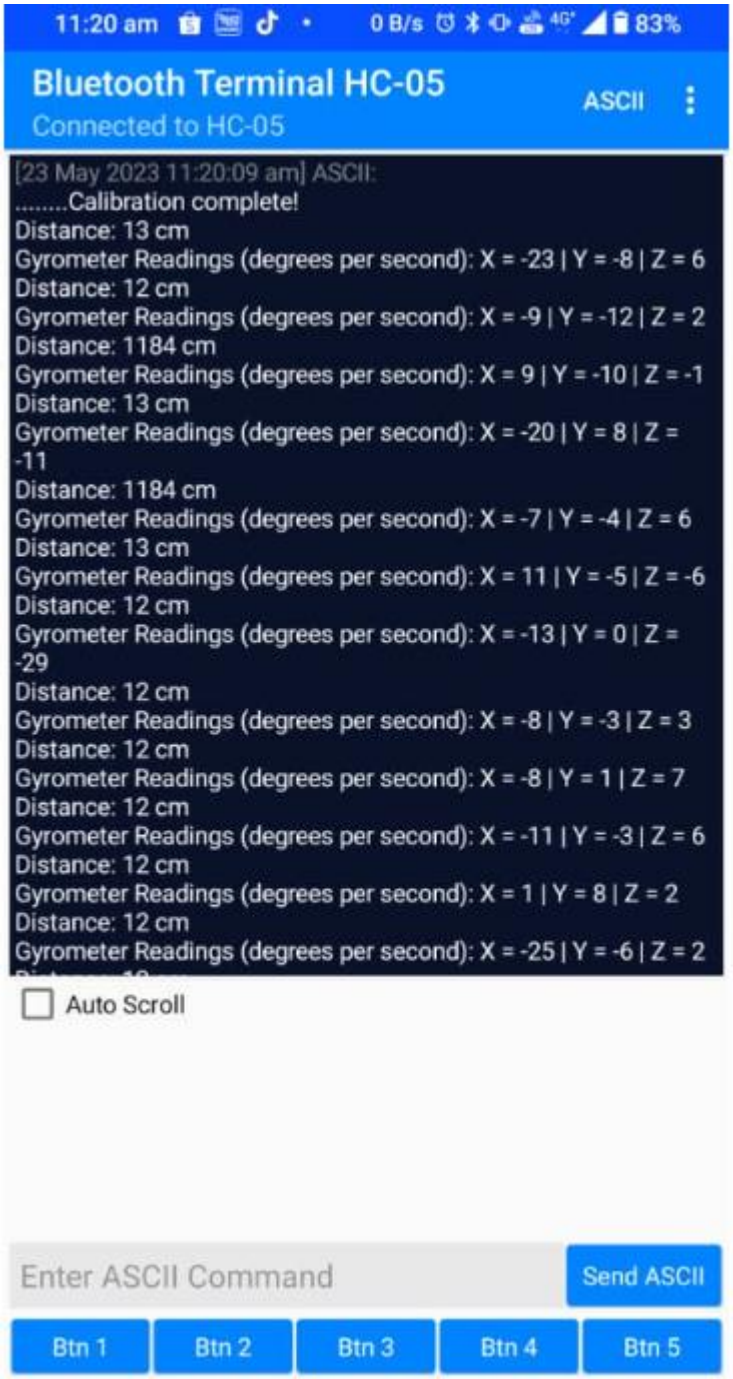


- Dependencies and Library need to install before proceed to running code:
  - ✓ SoftwareSerial
  - ✓ Wire: For I2C communication with the MPU6050 gyrometer sensor
  - ✓ MPU6050 library.
- Setup :
  - ✓ Serial Communication: Initializes the Serial monitor at a baud rate of 9600 for debugging purposes.
  - ✓ I2C and Gyrometer Initialization: Sets up I2C communication and initializes the MPU6050 gyrometer sensor. The connection with the sensor is tested, and the results are printed to the Serial monitor.
  - ✓ Bluetooth Initialization: Configures the SoftwareSerial library for Bluetooth communication at a baud rate of 9600.
  - ✓ Ultrasonic Sensor Pins: Sets the trigger and echo pins of the ultrasonic sensor as output and input, respectively.
  - ✓ Gyrometer Calibration: Calibrates the gyrometer by placing the sensor in a stable position for a few seconds. During this process, the gyrometer anchor values are determined to eliminate drift.
- LED control :
  - ✓ Red LED: Turns on when the distance measured by the ultrasonic sensor is less than 5cm.
  - ✓ Yellow LED: Turns on when the distance measured by the ultrasonic sensor is more than 50cm.
- Enter and run the coding. Link for Arduino full code from my GitHub account akimaziz: [HC-SR04-HC-05-MPU6050-Project/gyro_test.ino at main · akimaziz/HC-SR04-HC-05-MPU6050-Project (github.com)]

- Image from my smartphone below showed how the setup on the breadboard :



- Next image show the application install in android link with the data from the Arduino Serial Monitor:



- This application call as Bluetooth Terminal HC-05 can represent the result of distance and gyrometer readings.