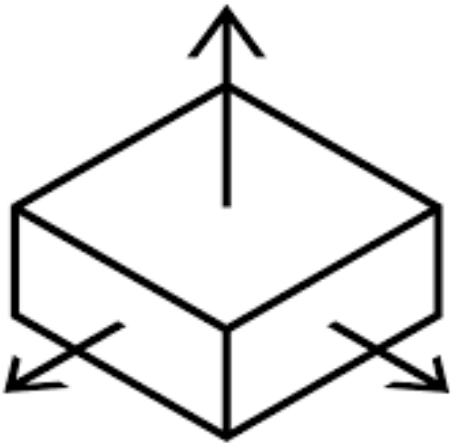
Manual for Hello IMU

Group 4: Rik van Velzen, Melissa van Leeuwen, Burhan Topaloglu



This document will showcase everything needed to launch our package.

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1. Setup

1.1 Setting up the Database

We will set up Mariadb and import our database.

Install components:

```
sudo apt update
sudo apt install libmariadb3 libmariadb-dev libmariadb-dev-compat
mariadb-server mariadb-client
```

Install the c++ connector for mariadb:
https://mariadb.com/docs/connectors/mariadb-connector-cpp/install-mariadb-connector-cpp
Direct download link (ubuntu 24.04 Noble x86, 24.04 has no tar.gz):
https://dlm.mariadb.com/4464930/Connectors/cpp/connector-cpp-1.1.7/mariadb-connector-cpp_1.1.7-1+maria~noble_amd64.deb

Setup mariadb, set up database and user:

```
sudo mariadb-secure-installation #choose anything in configuration
sudo systemctl start mariadb
sudo mariadb -u root
CREATE DATABASE hello_imu;
CREATE USER 'john_imu'@'localhost' IDENTIFIED BY '1234';
GRANT ALL PRIVILEGES ON hello_imu.* TO 'john_imu'@'localhost';
exit
```

To import our example database in "./backups/baseExample.sql":

```
//The password for this user is 1234!
//Restore backup:
mysql -u john_imu -p hello_imu < ./backups/baseExample.sql

//To Backup into file:
mariadb-dump --user=john_imu --password --lock-tables --extended-insert
--databases hello_imu > ./backups/mybackup.sql
```

Without Cmake, one would compile a package using mariadb like this:

```
g++ main.cpp Database.cpp -o appname -lmariadbcpp  #example!
```

We have configured Cmake to work accordingly.

1.2 Setting up Micro_ROS_Agent

To use the wired implementation the Micro_ROS_Agent is needed, to build it run:

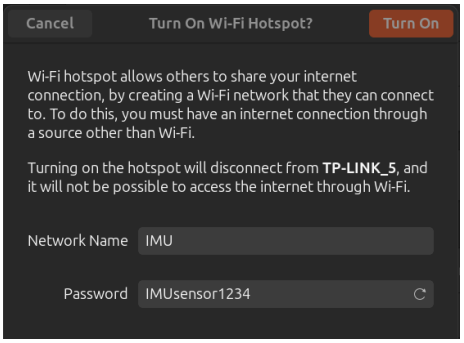
```
cd ~/rmb_ws/documentation/assign3/
./Micro_ROS_Agent_build.bash
```

To test the agent; connect the ESP32 and run:

```
ros2 run micro_ros_agent micro_ros_agent serial --dev /dev/ttyUSB0 -b
115200
```

1.3 Setting up Hotspot for wireless connection

When the wireless implementation is used, a hotspot is needed. The Wi-Fi at school is not suitable for an ESP32 to connect to, and when at different Wi-Fi networks the code needs to be changed for connection. So the solution is a Hotspot. To turn it on go to your Wi-Fi settings and turn on Wi-Fi Hotspot with these credentials:
SSID: IMU
Password: IMUsensor1234



Mysql GUI

We recommend installing an application that lets you view the database through a GUI, this will make testing much easier.
We recommend phpMyAdmin as it is lightweight, free, and easy to use and install.

```
sudo apt install php phpmyadmin
```

When going through the configuration, be careful to actually select Apache2 by pressing spacebar.
Then it is as simple as going to http://localhost/phpmyadmin and logging in as our user.

2. Execution

2.1 Parameters

The configurable parameter file is found in:

```
src/g425_assign3_pkg/config/assign3_params.yaml
```

2.2 Build it

```
cd ../rmb_ws
colcon build
source install/setup.bash
```

2.3 Launch it

To launch the wired solution with the launch file:

```
ros2 launch g425_assign3_pkg assign3_wired.launch.xml
```

To launch the wireless solution with the launch file:

```
ros2 launch g425_assign3_pkg assign3_wireless.launch.xml
```

That is all we need to know to launch the package!