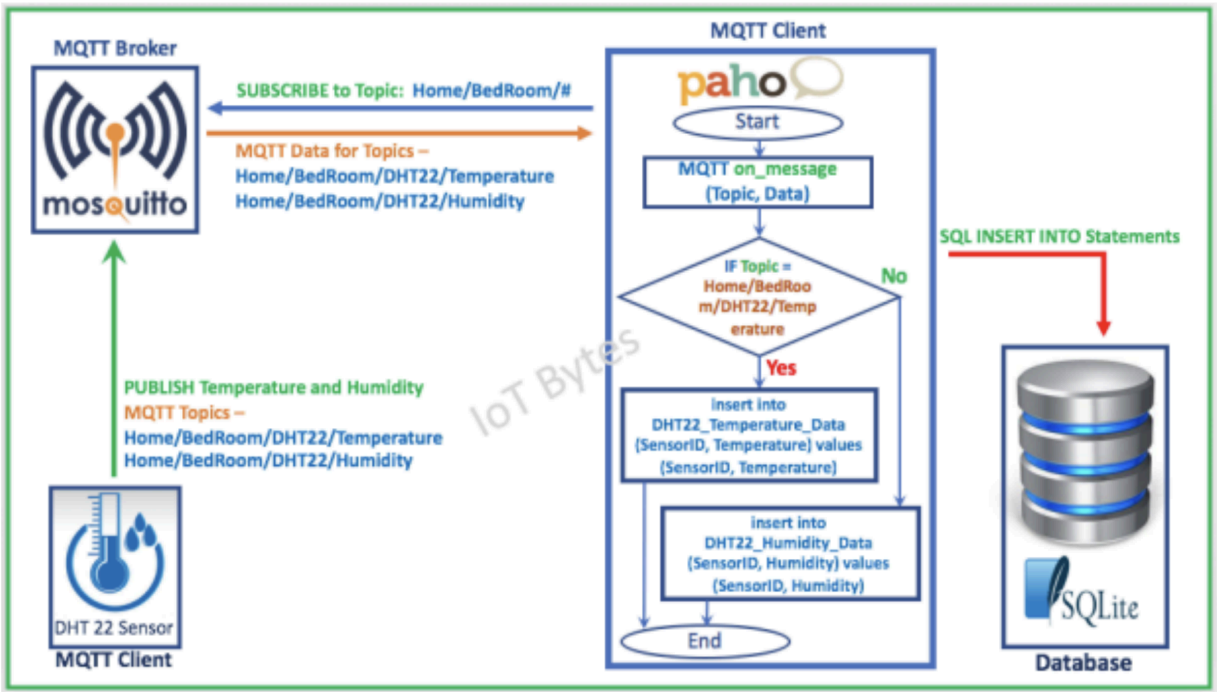
Lab work #4

MQTT Protocol usage – Storing Data in a Database

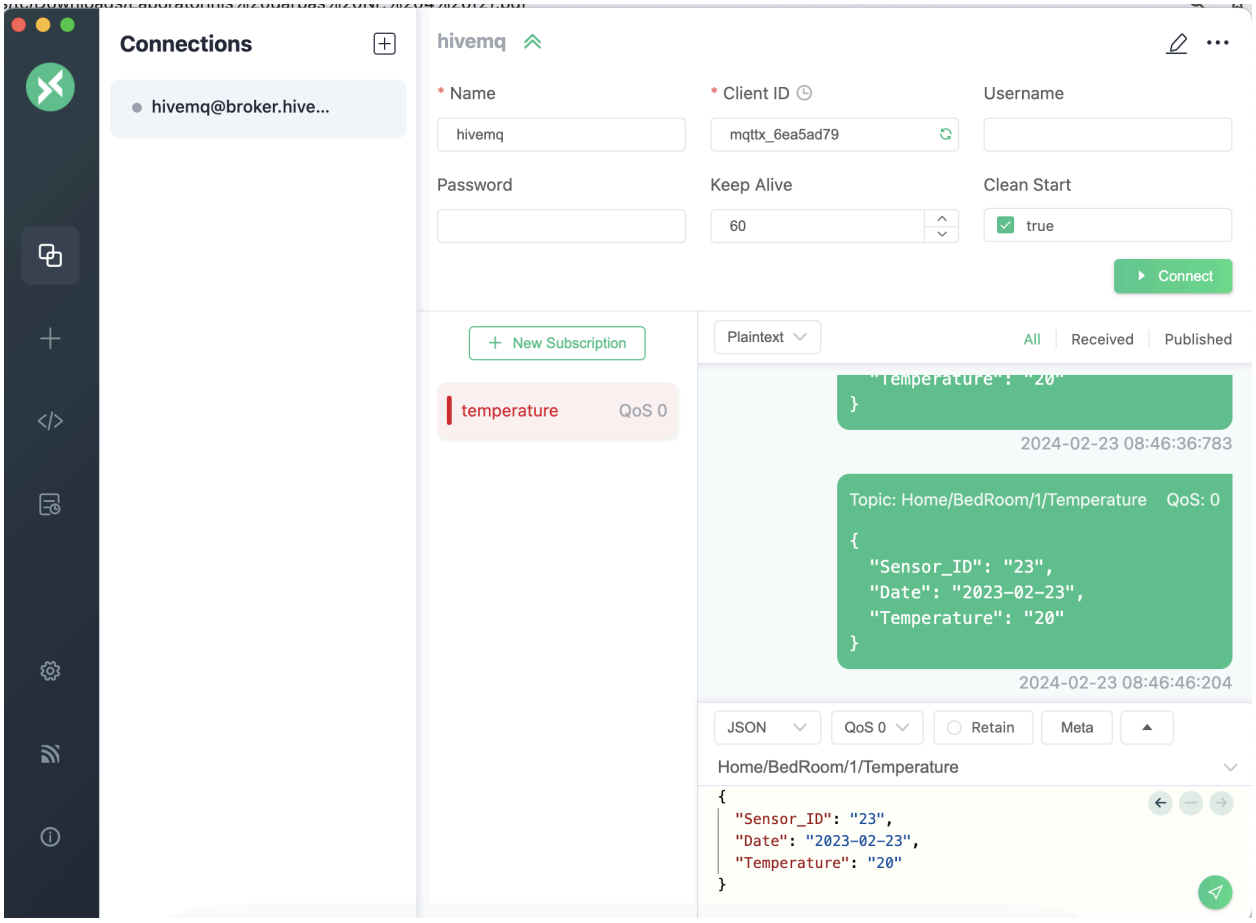
Objective of the work: Learn to record MQTT messages in a database and additionally add new statistical groups to the database. MQTT protocol testing is performed using MQTTBox and Paho (Python) MQTT client. You will find a example with implemented code, called mqtt_iot.py



Write a Python code example that can capture sent MQTT messages and record them in a database.

Using the same principle, it is necessary to write an additional Python-based MQTT code section that would store not only "temperature" or "humidity" parameters but also send a pressure value. To achieve this goal, it is necessary to modify the example.py:

- Add an additional section to the database structure
- Add additional code that can identify the additional "pressure" parameter received from the "payload." The payload is generated using MQTTBox
- Read the content of the database and display the recorded values, using the sqlite3 library



- The Publisher creates an optionally desired topic, in this case, "Home/BedRoom/1/Humidity," where 1 corresponds to the sensor position or number
- For testing, fill in the "Payload" section according to the provided example
- By clicking "Publish" and simultaneously running the example.py, you will receive a notification about the successful recording of the message in the IoT.db database

```
→  Store_MQTT_Data_in_Database git:(master) ✗ python3.7 pavyzdys.py
received message:  {
"Sensor_ID": "Dummy-1",
"Date": "2020-11-20",
"Humidity": 20
}
Inserted Humidity Data into Database.
```

Additional material:

In MQTT (Message Queuing Telemetry Transport), wildcards are used to subscribe to multiple topics using a more flexible and generalized approach. There are two types of wildcards commonly used in MQTT: "+" and "#".

Single-level wildcard (+):

- The single-level wildcard represents a single level in the topic hierarchy.
- For example, if you subscribe to the topic "home/+/temperature", you will receive messages from topics like "home/bedroom/temperature", "home/kitchen/temperature", etc.
- The "+" wildcard allows you to match any single level within a topic.

Multi-level wildcard (#):

- The multi-level wildcard represents multiple levels (including zero) in the topic hierarchy.
- For example, if you subscribe to the topic "home/bedroom/#", you will receive messages from topics like "home/bedroom/temperature", "home/bedroom/humidity", and so on.
- The "#" wildcard allows you to match any number of levels within a topic.