1. Створили топіки. При створенні відписались, та перед завершенням виконали ще одну перевірку, що топіки з'явилися:

```
Connected to Kafka.
Available topics #: 173
Топіки створені успішно:
- vvd_building_sensors
- vvd_temperature_alerts
- vvd_humidity_alerts
Перевірка створення топиків:
vvd_temperature_alerts
vvd_humidity_alerts
vvd_building_sensors
```

2. Генеруємо дані сенсорів. 3 рази. Кожний запуск – унікальне ID сенсора. Очікував щоб вологість з'явилася для алерта:

```
PS C:\> & C:/Users/vdubr/AppData/Local/Programs/Python/Python312/python.exe "c:/Users/vdubr/OneDrive/Документы/GoIT Обучение/Data Engineering/goit-de-hw-05/p2.py"
Message delivered to vvd_building_sensors [0]
Sent data: {'sensor_id': 62, 'timestamp': '2024-11-23 20:58:20', 'temperature': 29.5, 'humidity': 44.7}
Message delivered to vvd_building_sensors [0]
Sent data: {'sensor_id': 62, 'timestamp': '2024-11-23 20:58:26', 'temperature': 27.7, 'humidity': 25.6}
Message delivered to vvd_building_sensors [0]
Sent data: {'sensor_id': 62, 'timestamp': '2024-11-23 20:58:31', 'temperature': 41.1, 'humidity': 78.0}
Stopped by user
PS C:\> & C:/Users/vdubr/AppData/Local/Programs/Python/Python312/python.exe "c:/Users/vdubr/OneDrive/Документы/GoIT Обучение/Data Engineering/goit-de-hw-05/p2.py"
Message delivered to vvd_building_sensors [0]
Sent data: {'sensor_id': 87, 'timestamp': '2024-11-23 20:58:38', 'temperature': 30.7, 'humidity': 26.7}
Message delivered to vvd_building_sensors [0]
Sent data: {'sensor_id': 87, 'timestamp': '2024-11-23 20:58:43', 'temperature': 28.2, 'humidity': 59.3}
Message delivered to vvd_building_sensors [0]
Sent data: {'sensor_id': 87, 'timestamp': '2024-11-23 20:58:48', 'temperature': 43.4, 'humidity': 65.6}
Message delivered to vvd_building_sensors [0]
Sent data: {'sensor_id': 87, 'timestamp': '2024-11-23 20:58:53', 'temperature': 43.0, 'humidity': 37.6}
Stopped by user
PS C:\> & C:/Users/vdubr/AppData/Local/Programs/Python/Python312/python.exe "c:/Users/vdubr/OneDrive/Документы/GoIT Обучение/Data Engineering/goit-de-hw-05/p2.py"
Message delivered to vvd_building_sensors [0]
Sent data: {'sensor_id': 32, 'timestamp': '2024-11-23 20:58:58', 'temperature': 38.2, 'humidity': 68.0}
Message delivered to vvd_building_sensors [0]
Sent data: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:03', 'temperature': 36.7, 'humidity': 62.9}
Message delivered to vvd_building_sensors [0]
Sent data: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:09', 'temperature': 28.7, 'humidity': 35.9}
Message delivered to vvd_building_sensors [0]
Sent data: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:14', 'temperature': 30.8, 'humidity': 62.8}
Message delivered to vvd_building_sensors [0]
Sent data: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:19', 'temperature': 40.4, 'humidity': 67.3}
Message delivered to vvd_building_sensors [0]
Sent data: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:24', 'temperature': 33.9, 'humidity': 23.0}
Message delivered to vvd_building_sensors [0]
Sent data: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:29', 'temperature': 42.6, 'humidity': 63.0}
Message delivered to vvd_building_sensors [0]
Sent data: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:34', 'temperature': 31.6, 'humidity': 38.3}
Message delivered to vvd_building_sensors [0]
Sent data: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:39', 'temperature': 30.3, 'humidity': 27.2}
Message delivered to vvd_building_sensors [0]
Sent data: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:44', 'temperature': 43.6, 'humidity': 55.0}
Message delivered to vvd_building_sensors [0]
Sent data: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:49', 'temperature': 26.9, 'humidity': 45.5}
Message delivered to vvd_building_sensors [0]
Sent data: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:54', 'temperature': 41.6, 'humidity': 58.2}
Message delivered to vvd_building_sensors [0]
Sent data: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:59', 'temperature': 30.7, 'humidity': 51.8}
Message delivered to vvd_building_sensors [0]
Sent data: {'sensor_id': 32, 'timestamp': '2024-11-23 21:00:04', 'temperature': 40.0, 'humidity': 67.3}
Message delivered to vvd_building_sensors [0]
Sent data: {'sensor_id': 32, 'timestamp': '2024-11-23 21:00:09', 'temperature': 29.4, 'humidity': 19.9}
Message delivered to vvd_building_sensors [0]
Sent data: {'sensor_id': 32, 'timestamp': '2024-11-23 21:00:14', 'temperature': 42.9, 'humidity': 23.4}
Message delivered to vvd_building_sensors [0]
Sent data: {'sensor_id': 32, 'timestamp': '2024-11-23 21:00:19', 'temperature': 33.8, 'humidity': 38.9}
Stopped by user
PS C:\>
```

3. Перед строкою з даними, що відправляємо як алерти – йде нотіфікація:

```
PS C:\> & C:/Users/vdubr/AppData/Local/Programs/Python/Python312/python.exe "c:/Users/vdubr/OneDrive/Документы/GoIT Обучение/Data Engineering/goit-de-hw-05/p3.py"
Processed data: {'sensor_id': 62, 'timestamp': '2024-11-23 20:58:20', 'temperature': 29.5, 'humidity': 44.7}
Processed data: {'sensor_id': 62, 'timestamp': '2024-11-23 20:58:26', 'temperature': 27.7, 'humidity': 25.6}
Message delivered to vvd_temperature_alerts [0]
Processed data: {'sensor_id': 62, 'timestamp': '2024-11-23 20:58:31', 'temperature': 41.1, 'humidity': 78.0}
Processed data: {'sensor_id': 87, 'timestamp': '2024-11-23 20:58:38', 'temperature': 30.7, 'humidity': 26.7}
Processed data: {'sensor_id': 87, 'timestamp': '2024-11-23 20:58:43', 'temperature': 28.2, 'humidity': 59.3}
Message delivered to vvd_temperature_alerts [0]
Processed data: {'sensor_id': 87, 'timestamp': '2024-11-23 20:58:48', 'temperature': 43.4, 'humidity': 65.6}
Message delivered to vvd_temperature_alerts [0]
Processed data: {'sensor_id': 87, 'timestamp': '2024-11-23 20:58:53', 'temperature': 43.0, 'humidity': 37.6}
Processed data: {'sensor_id': 32, 'timestamp': '2024-11-23 20:58:58', 'temperature': 38.2, 'humidity': 68.0}
Processed data: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:03', 'temperature': 36.7, 'humidity': 62.9}
Processed data: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:09', 'temperature': 28.7, 'humidity': 35.9}
Processed data: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:14', 'temperature': 30.8, 'humidity': 62.8}
Message delivered to vvd_temperature_alerts [0]
Processed data: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:19', 'temperature': 40.4, 'humidity': 67.3}
Processed data: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:24', 'temperature': 33.9, 'humidity': 23.0}
Message delivered to vvd_temperature_alerts [0]
Processed data: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:29', 'temperature': 42.6, 'humidity': 63.0}
Processed data: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:34', 'temperature': 31.6, 'humidity': 38.3}
Processed data: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:39', 'temperature': 30.3, 'humidity': 27.2}
Message delivered to vvd_temperature_alerts [0]
Processed data: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:44', 'temperature': 43.6, 'humidity': 55.0}
Processed data: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:49', 'temperature': 26.9, 'humidity': 45.5}
Message delivered to vvd_temperature_alerts [0]
Processed data: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:54', 'temperature': 41.6, 'humidity': 58.2}
Processed data: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:59', 'temperature': 30.7, 'humidity': 51.8}
Processed data: {'sensor_id': 32, 'timestamp': '2024-11-23 21:00:04', 'temperature': 40.0, 'humidity': 67.3}
Message delivered to vvd_humidity_alerts [0]
Processed data: {'sensor_id': 32, 'timestamp': '2024-11-23 21:00:09', 'temperature': 29.4, 'humidity': 19.9}
Message delivered to vvd_temperature_alerts [0]
Processed data: {'sensor_id': 32, 'timestamp': '2024-11-23 21:00:14', 'temperature': 42.9, 'humidity': 23.4}
Processed data: {'sensor_id': 32, 'timestamp': '2024-11-23 21:00:19', 'temperature': 33.8, 'humidity': 38.9}
Stopped by user
PS C:\> []
```

4. Дані з алертів:

```
PS C:\> & C:/Users/vdubr/AppData/Local/Programs/Python/Python312/python.exe "c:/Users/vdubr/OneDrive/Документы/GoIT Обучение/Data Engineering/goit-de-hw-05/p4.py"
Temperature Alert: {'sensor_id': 62, 'timestamp': '2024-11-23 20:58:31', 'temperature': 41.1, 'message': 'Temperature exceeds threshold'}
Humidity Alert: {'sensor_id': 32, 'timestamp': '2024-11-23 21:00:09', 'humidity': 19.9, 'message': 'Humidity out of range'}
Temperature Alert: {'sensor_id': 87, 'timestamp': '2024-11-23 20:58:48', 'temperature': 43.4, 'message': 'Temperature exceeds threshold'}
Temperature Alert: {'sensor_id': 87, 'timestamp': '2024-11-23 20:58:53', 'temperature': 43.0, 'message': 'Temperature exceeds threshold'}
Temperature Alert: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:19', 'temperature': 40.4, 'message': 'Temperature exceeds threshold'}
Temperature Alert: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:29', 'temperature': 42.6, 'message': 'Temperature exceeds threshold'}
Temperature Alert: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:44', 'temperature': 43.6, 'message': 'Temperature exceeds threshold'}
Temperature Alert: {'sensor_id': 32, 'timestamp': '2024-11-23 20:59:54', 'temperature': 41.6, 'message': 'Temperature exceeds threshold'}
Temperature Alert: {'sensor_id': 32, 'timestamp': '2024-11-23 21:00:14', 'temperature': 42.9, 'message': 'Temperature exceeds threshold'}
Stopped by user
PS C:\> []
```