SP22 MSE 598 Lecture #4: SENSELET

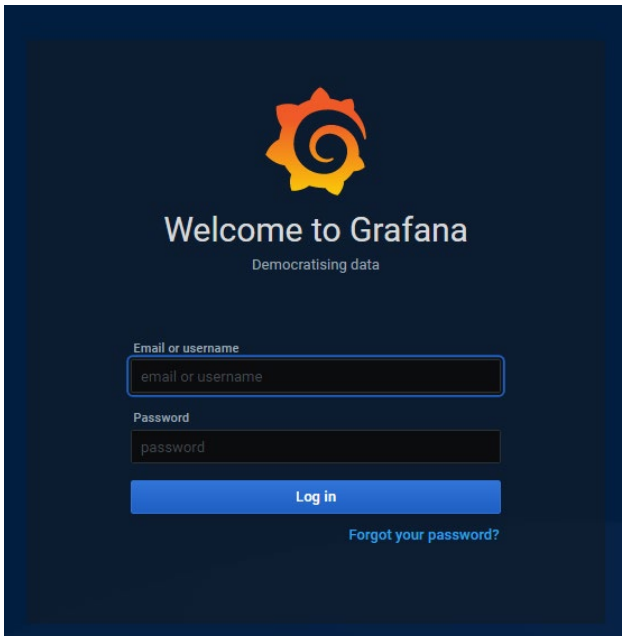
Exploring SENSELET Visualization and Alert Features

Checklist before you start:

- ❑ You need to connect to **IllinoisNet**
- ❑ Recommend to use **Chrome** browser

Task 0: Login to Grafana and open the dashboard

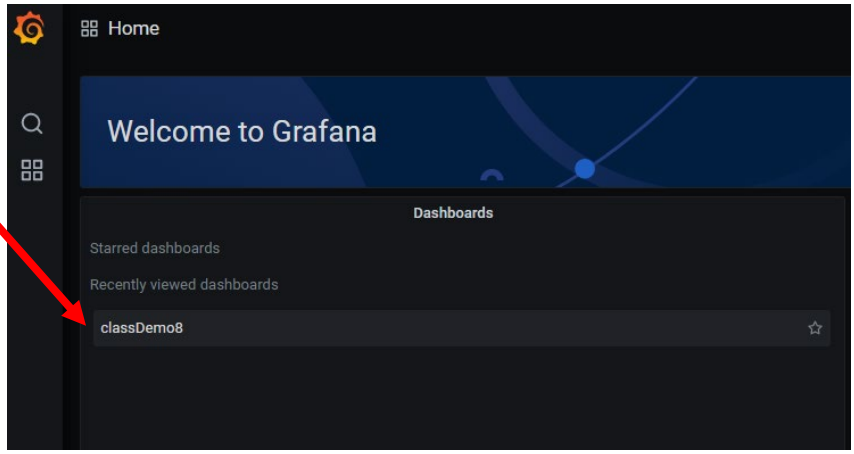
0.1 Login URL: http://130.126.138.66:3001/



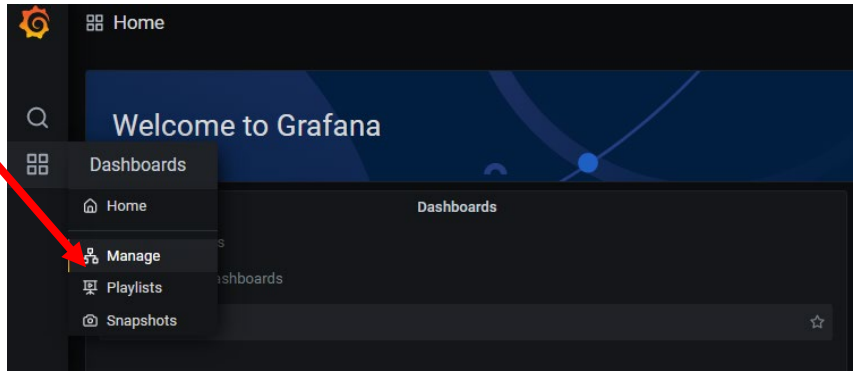
0.2 Enter username and password

Please use the username and password in this google sheet: https://docs.google.com/spreadsheets/d/1EYg3iOBaM0EtPdgTXwi1XQDiH0pzAMqvN0rwhJwfpPk/edit?usp=sharing

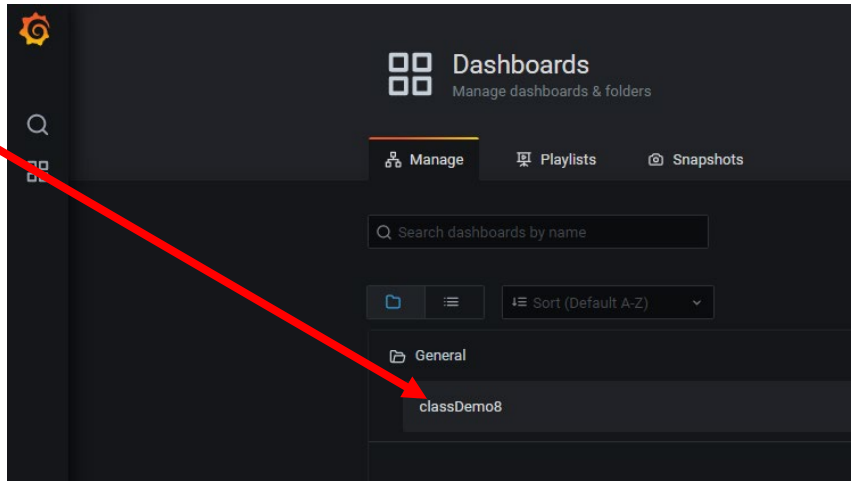
You should see the dashboard named classDemoX.



If not, please click **Manage** button



Then click the dashboard name.



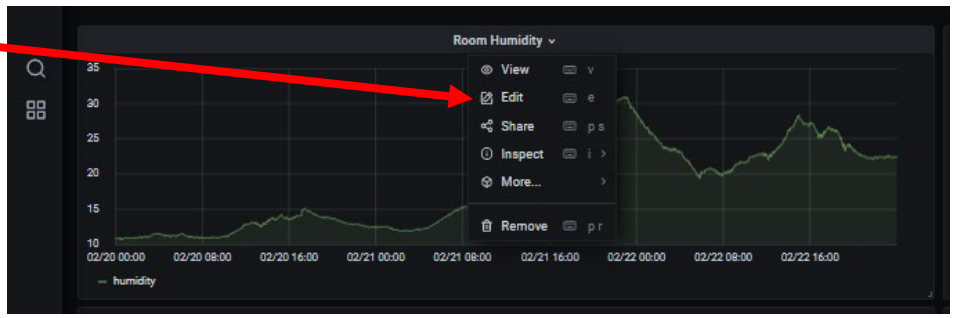
You should see a dashboard like this. **Congrats! Task 0 finish.**

The dashboard shows multiple sensor data from 02/20/2021 to 02/22/2021.

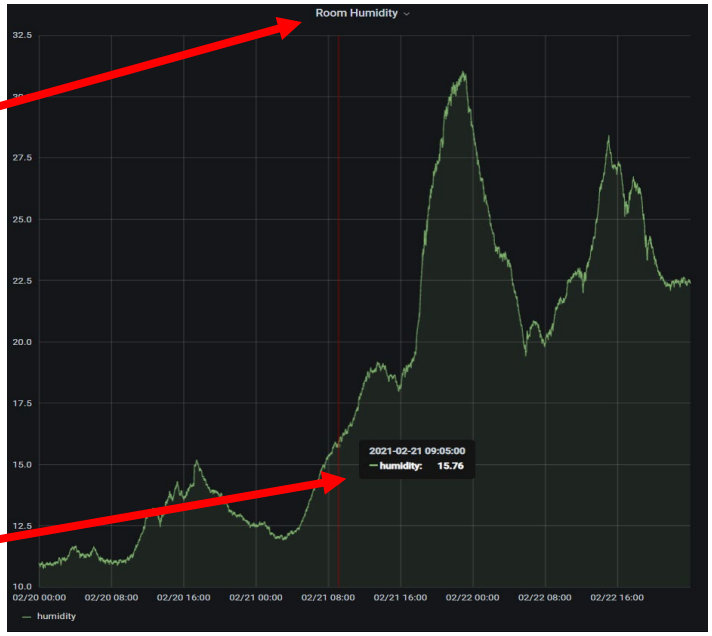
Task 1: View the data

1.1 View the data - Basics

Click edit button of the Room Humidity panel



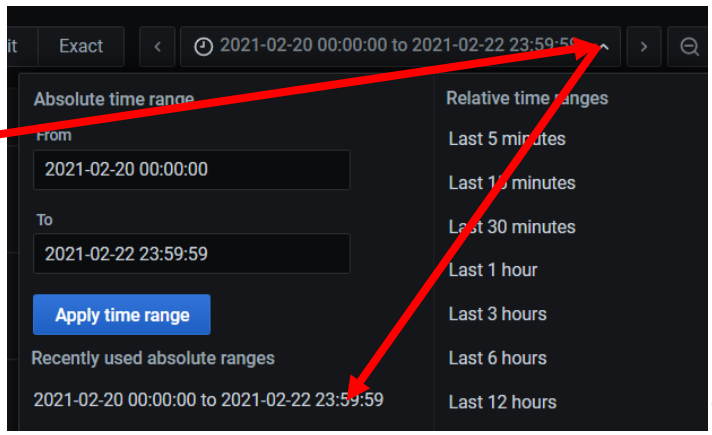
You can use the panel name or legends to know the sensor name. This panel shows the humidity data in a cleanroom.



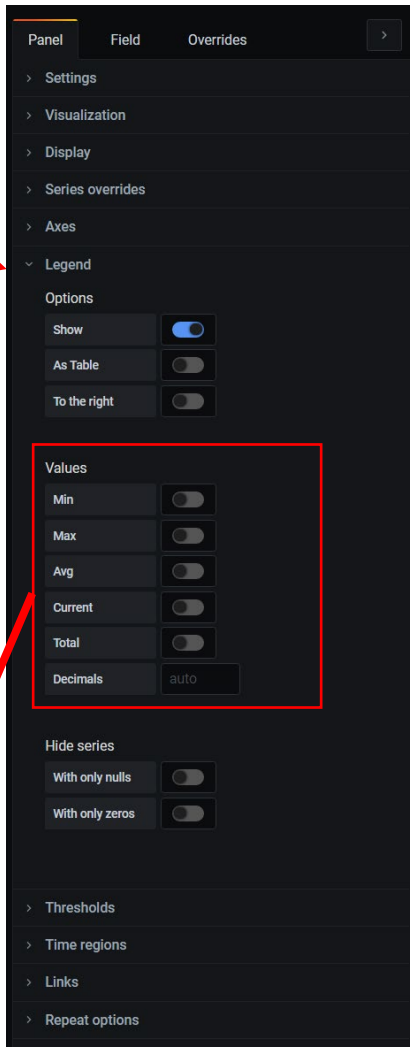
You can move your mouse over the graph and read the value of each data point.

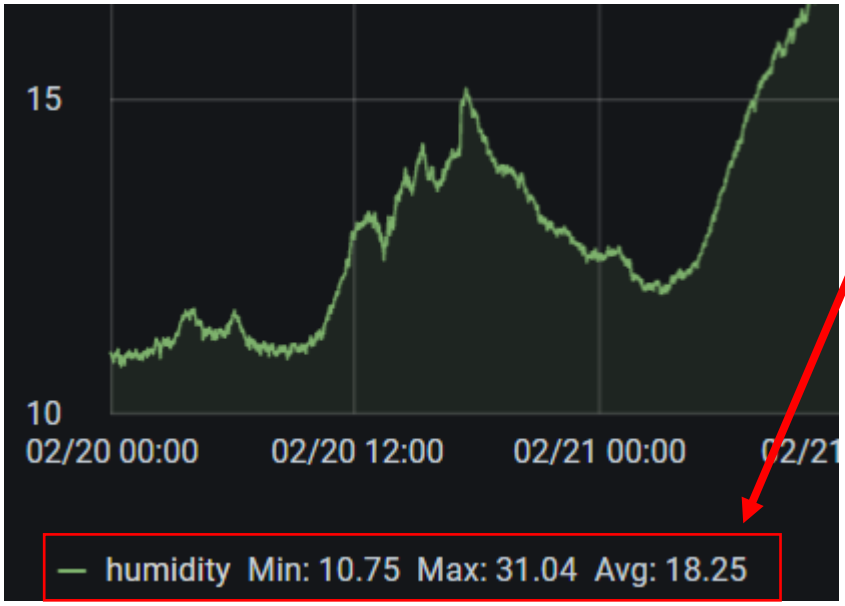
If you are interested in the data in a specific time period, you can **drag** to zoom into the time period you want to view

If you want to go back to the original time range,
Click the recently used absolute ranges
It should be 2021-02-20 – 2021-02-22.
Or you can set up the time manually using From and To.



If you want to quickly know some stats of the data, you can set the legend on the right-hand side

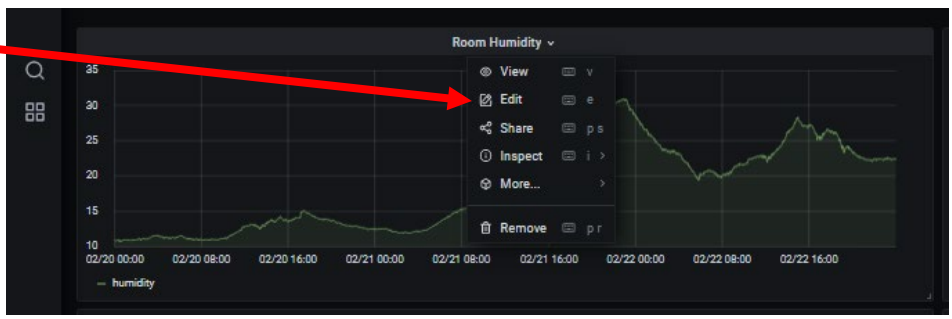




Now please use above tips to view different panels to get familiar to the Grafana and provided data.

1.2 View the data - Advance

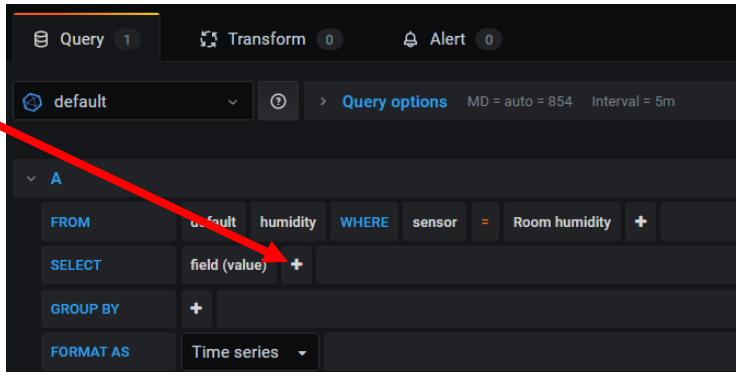
We will use the room humidity panel as our example



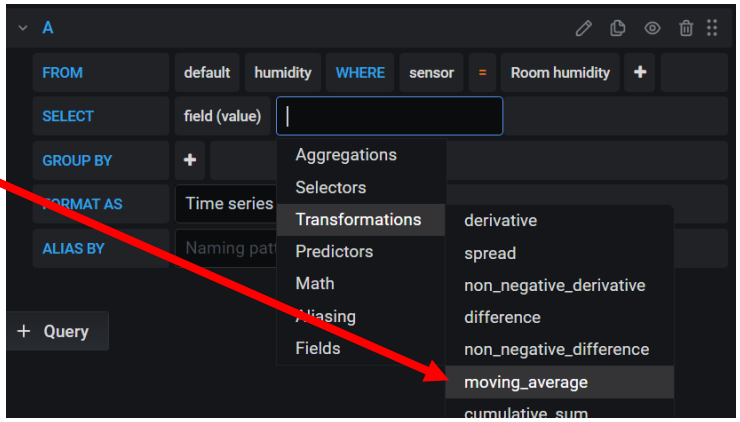
1.2.1 Preprocess the data in Grafana

Sometimes, the real trend may be hided under the noise. In this session, you will learn how to smooth the data with functions embedded in Grafana.

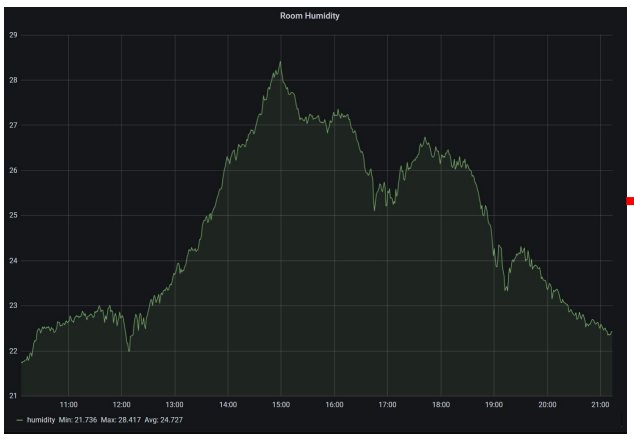
Click plus button

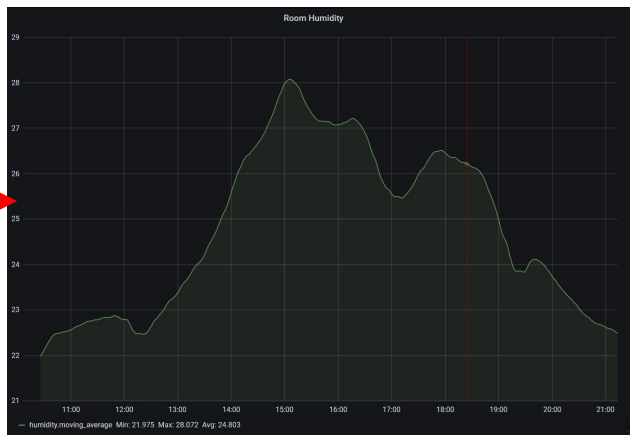


Add Transformation/ moving_average



The result should look like this





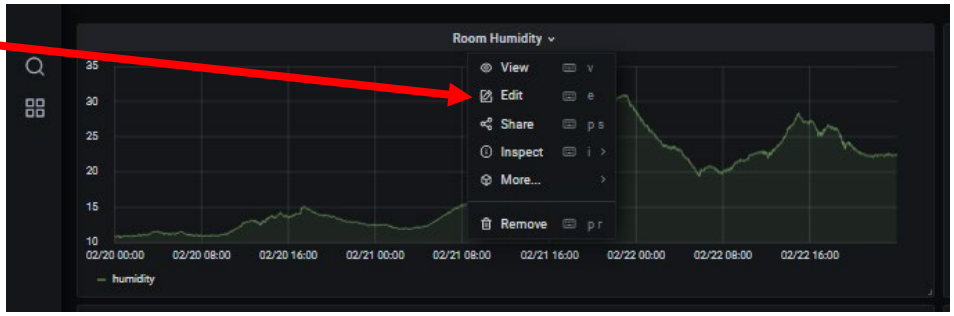
Room humidity data is not very noisy. Try to smooth the data in the **Room HVAC Airflow panel** and discuss the result.

The result should look like this

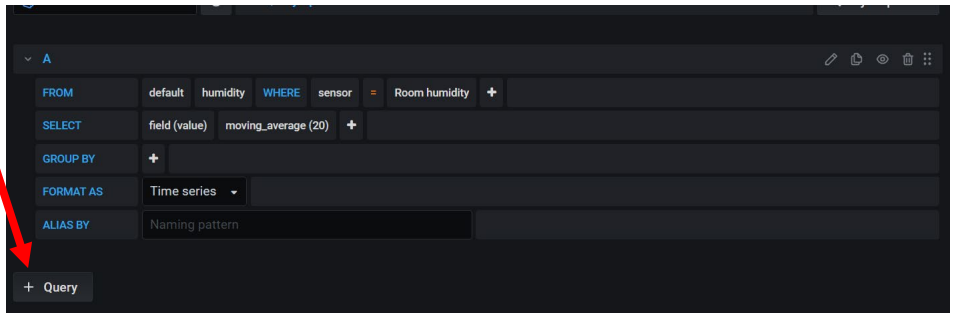
1.2.2 Show multiple data series in one panel

If we want to view multiple sensor streams in the same panel, we can apply the following steps.

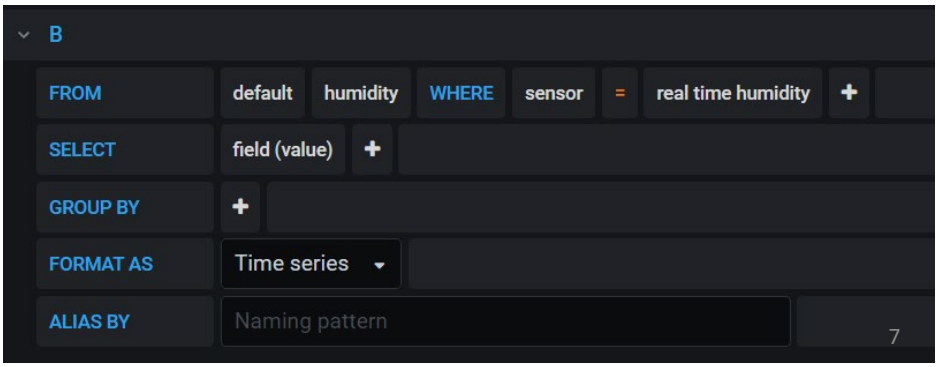
We will still use the room humidity panel as our example



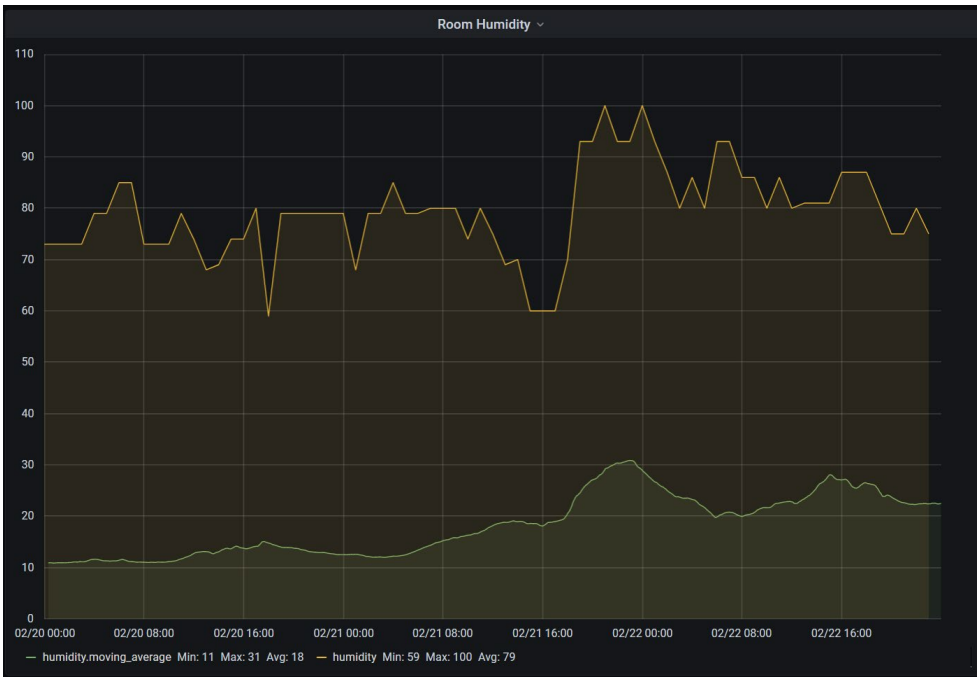
Click + Query



Here we are interested in comparing indoor humidity and outdoor humidity. You can set the query like this.



The result should look like this



Now you know how to

- View the data
- Preprocess the data
- Put different data sources into the same panel

Please use these skills to explore the dashboard and when you are browsing the dashboard, please think about the two questions below.

Discussion:

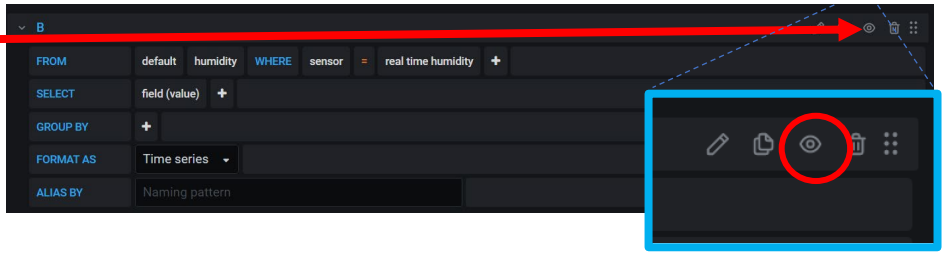
1. What interesting patterns or abnormal values can you find in each panel? Can you guess what causes those abnormal values?
2. What correlations can you find among different panels? Can you use the correlations to explain those abnormal values that you observe in question 1?

Congrats! Task 1 finish.

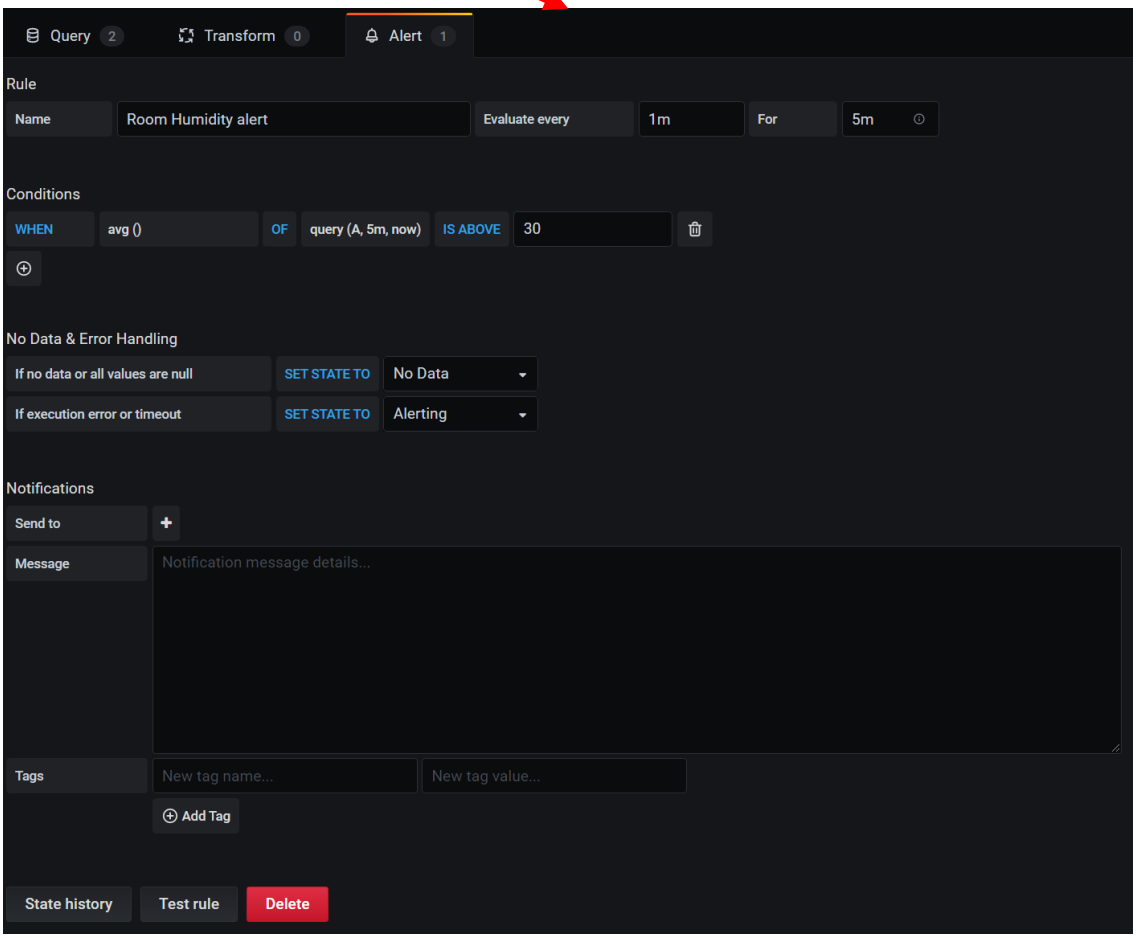
Task 2: Add alerts (Optional)

When the system detects abnormal values, e.g., a very high humidity, the system can send alerts via the e-mail.

In the Room Humidity Edit panel, hide the query of real time humidity used for task1.

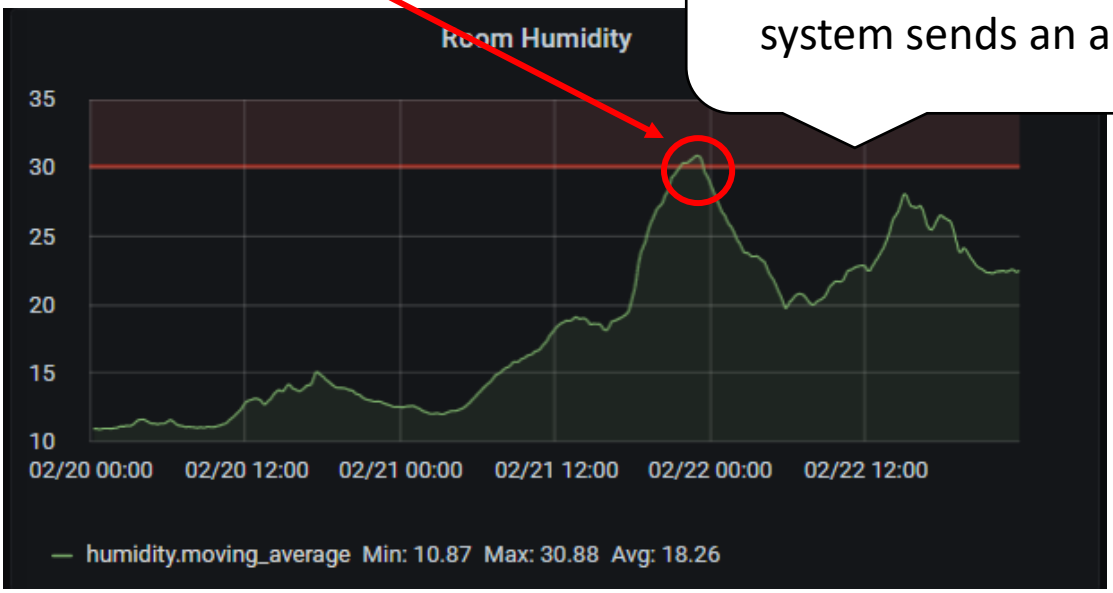


Click alert and set it like this.



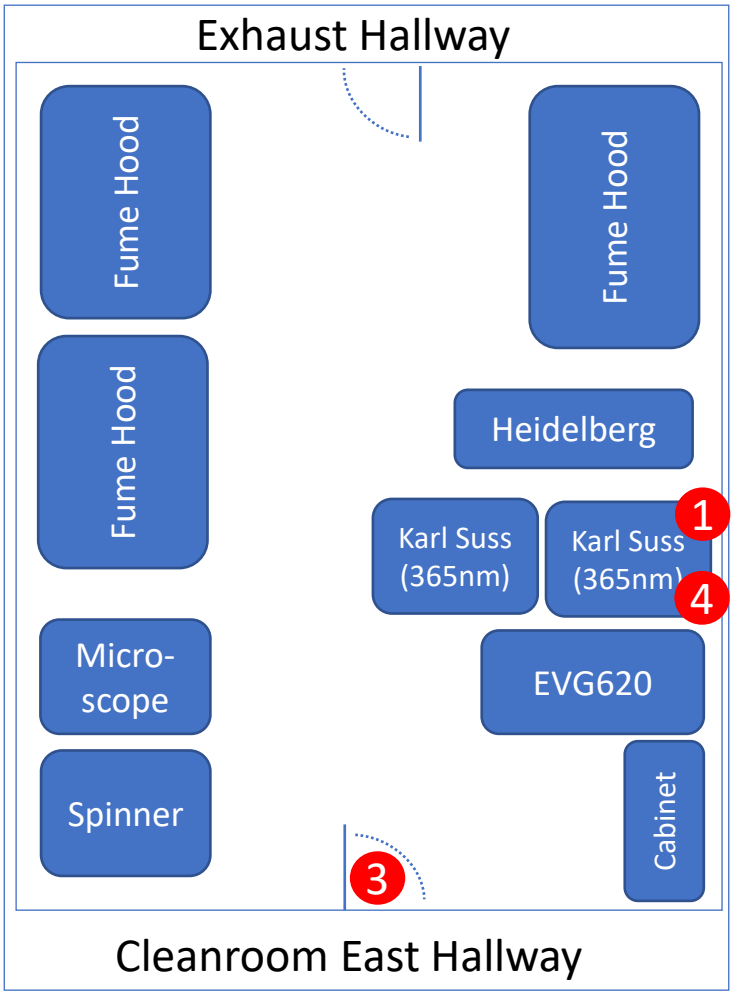
The result should look like this

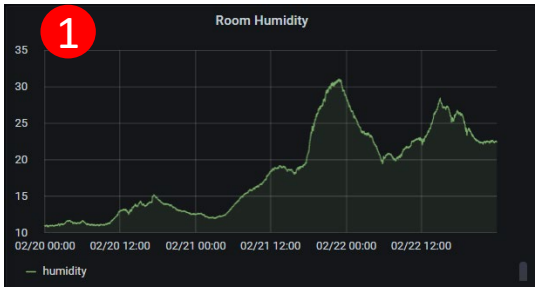
When the room humidity is larger than 30 RH%, the system sends an alert.



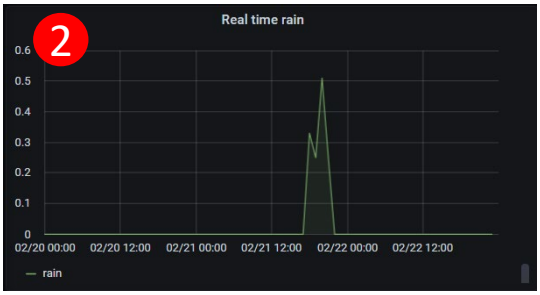
Congrats! Task 2 finish.

Supplementary: Data source locations and descriptions



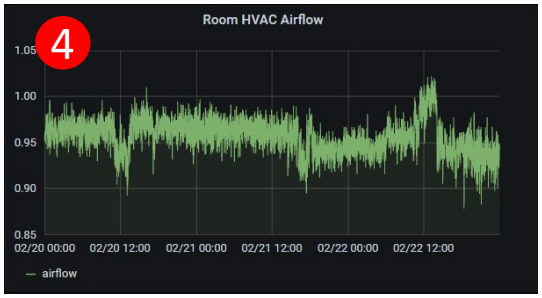


Room Humidity/Temperature shows the indoor humidity and temp. at location 1.

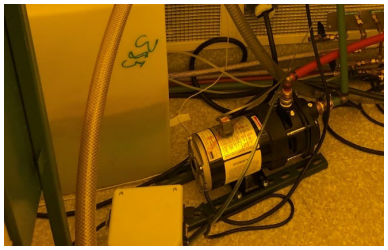


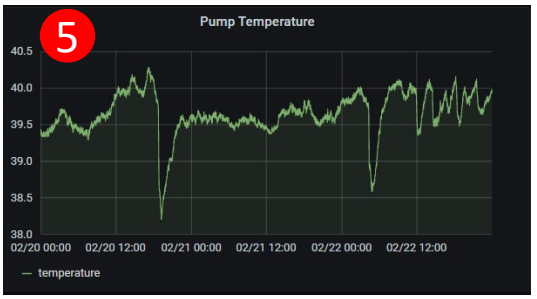
Real time rain/snow/humidity/temperature shows outdoor readings in Champaign.

Door (at location 3): 0 means the door is closed, 1 means the door is open.



Room HVAC Airflow
The airflow speed close to the vent (at location 4) of the HVAC system.





Pump Temperature:
Pump surface temperature. The pump is in another room as shown in the left picture.