VOLTRON AI

The Goal

The goal of the AI team will be to create a model to predict the evolution of **humidity** and **temperature** in the room over a **period of time**, in order to take various precautions in advance.

This model will have to be based on a dataset given by the **Big Data team**, which themselves will have to get a set from the **IOT team**.

These forecasts will allow hospitals to maximize the use of operating rooms, in order to limit downtime, given that operating rooms are subject to very strict air quality standards.

The method

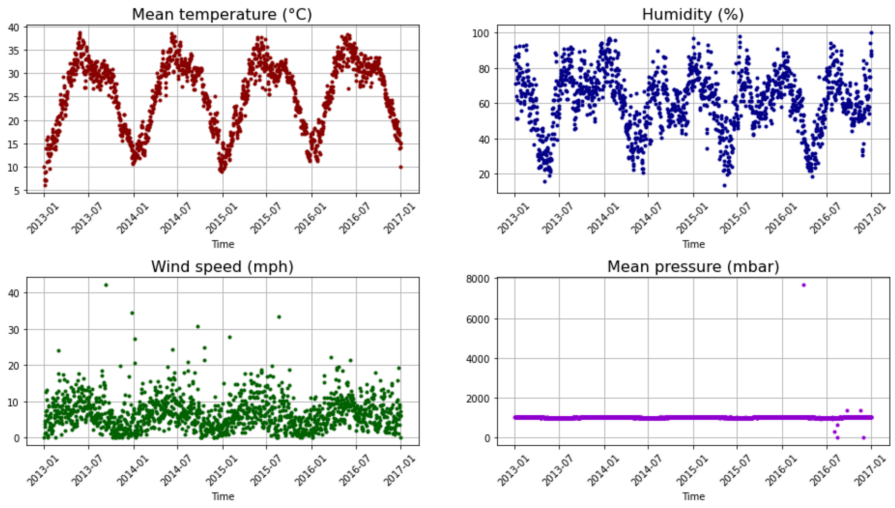
In order to prepare the ground, a dataset available at the following address was used:

https://www.kaggle.com/datasets/sumanthvrao/daily-climate-time-series-data

It gives us over a period of 5 years, day by day of sensor readings:

- Humidity
- Temperature
- Air pressure
- Wind speed

We first made graphs that we will use later to display the prediction on the requested period T time



The study model used will initially be **LinearRegression**

Why ?

The linear regression algorithm learns how to make a weighted sum from its input features. For two features, we would have:

```
target = weight_1 * feature_1 + weight_2 * feature_2 + bias
```

We then referenced the days by **Id**, in order to be able to choose the **desired period** during the prediction:

date	meantemp	humidity	wind_speed	meanpressure	Time
2013-01-01	10.000000	84.500000	0.000000	1015.666667	0
2013-01-02	7.400000	92.000000	2.980000	1017.800000	1
2013-01-03	7.166667	87.000000	4.633333	1018.666667	2
2013-01-04	8.666667	71.333333	1.233333	1017.166667	3
2013-01-05	6.000000	86.833333	3.700000	1016.500000	4
2013-01-06	7.000000	82.800000	1.480000	1018.000000	5
2013-01-07	7.000000	78.600000	6.300000	1020.000000	6
2013-01-08	8.857143	63.714286	7.142857	1018.714286	7
2013-01-09	14.000000	51.250000	12.500000	1017.000000	8
2013-01-10	11.000000	62.000000	7.400000	1015.666667	9
2013-01-11	15.714286	51.285714	10.571429	1016.142857	10
2013-01-12	14.000000	74.000000	13.228571	1015.571429	11
2013-01-13	15.833333	75.166667	4.633333	1013.333333	12
2013-01-14	12.833333	88.166667	0.616667	1015.166667	13
2013-01-15	14.714286	71.857143	0.528571	1015.857143	14
2013-01-16	13.833333	86.666667	0.000000	1016.666667	15
2013-01-17	16.500000	80.833333	5.250000	1015.833333	16

Here is a new graph proposing a prediction for a period not yet defined: