**The interview**

* Could you explain the main technique that is employed in your company to predict air temperature?

Weather prediction go through different stages, first stages, numerical weather prediction models (NWPS) which is physics equations, local model are implemented and give different parameter for air temperature and forecasting for multiple days, then we do forecasting correction by getting the model forecasting result in past 5 days (for example) and the model forecasting result for the next 5 days, and observation (actual result) and then calculate the model error percentage and changing the forecasting result for next 5 days depending on the model errors, my dataset was recorded based on actual result of air temperature in different places in different days.

* How do you evaluate temperature forecasting models for accuracy?

Air temperature forecasting will be more accurate using NPWS technique.

* About machine learning different models, could you give examples of strong machine learning models that have the best results in air temperature forecasts so far?

Linear regression, random forest, and decision tree are examples of machine learning models to build a simple model to predict air temperature using the dataset. These models used to make time series forecasting to predict air temperature for the next day. Using deep learning for time series forecasting is not efficient as machine learning. Moreover, random forest will probably be the best model among the rest of regression-based model.

* What is the essential feature of a dataset used for temperature forecasting, and how important are they to the precision of the predictions?

In weather forecasting, the important feature is the previous records for the temperatures. The second thing is the future records which are not available in my dataset. The expert said that in this situation we do something called auto correlation which is the relation between the past records of temperature and the current readings. Let’s say the current reading for temperature is 17, what is it relation with the past two hours reading which is for example 15, the reading for the past day is 16, the reading for the past three days is 14, and the readings for the past one week is 8. The reading of the past week is far away from the current reading which tell us that the relation between them is weak, but the reading for the past three days is closer to current reading than the past week reading, also the reading for the past day is much closer to current reading, and the reading for the past two hours is even closer than the rest. That’s tell us that auto correlation illustrates how the close past readings influence the current and the future reading more than the far reading, also the relation between the closed reading with the future (predicted) reading is strong.

* What are the primary obstacles in the forecasting of air temperature?

The first obstacle is data preprocessing. Second one, handling the models’ errors. Third one, keep the accuracy high as much as possible.

**Primary research analysis**

in the analyzing process, I will use the thematic analysis method. This method is about themes and the analysis for these themes. The interview will be analyzed by putting several themes or in other word important points and topics that were in the interview, and then analyze each point.

**NWPS Technique.**

The expert first explains how important the NWPS method is for assessing models that predict temperature. This method compares observed data collected over a given period of time with model forecasts. The topic emphasizes a useful and data-driven review process by implying that forecasting models' accuracy should be confirmed by experimental data.

**Combining models with Correction procedures.**

The Expert outlines several steps in the followed air temperature forecasting process in Arab weather company, beginning with the use of NWPS, then, observational data and both past and current model forecasts are used to apply correction process. To make more accurate forecasts, this point highlights the significance of integrating observations from the real world with models.

**Time series forecasting using machine learning models.**

The expert suggests decision trees, random forest, and linear regression models as examples of methods for forecasting air temperature. Time series forecasting is the focus, and past temperature readings are significant to this process. In this case, machine learning is preferred over deep learning, indicating that efficiency and model fit are important considerations.

**Importance of Time Series, past records Data and Autocorrelation.**

The expert highlights the importance of time series data while outlining a dataset's key components. One important method for comprehending the connections between past temperature readings and the current forecast is the introduction of autocorrelation. The theme emphasizes how crucial it is to take temporal dependencies into account to make precise forecasts. Moreover, we understood through the interview how strong the relation between the past records and the future records (predicted records).

**Data Preprocessing.**

Managing model mistakes, preserving high forecasting accuracy, and the complexity of data preprocessing are the challenges that have been discovered during the meeting with the expert. In order to improve the overall accuracy of temperature predictions, this theme highlights the practical difficulties associated with the forecasting process and emphasizes the necessity of strong data preparation methods and efficient error-handling procedures. The analysis of this theme also tells us and explains the process of weather forecasting using machine learning models in clear way.