

## **Task: Analyzing Temperature and Humidity Data using Pandas and Plotly**

**Objective:** The objective of this task is to analyze and visualize temperature and humidity data using pandas and plotly libraries in Python. The interns will be required to load, preprocess, analyze, and visualize the data in a meaningful way.

**Data:** The interns will be given a CSV file containing temperature and humidity data recorded by sensors over a period of time. The CSV file will have the following columns:

- Timestamp (datetime format)
- Temperature (float format)
- Humidity (float format)

### **Task Description:**

1. Load the CSV file into a pandas dataframe.
2. Preprocess the data by checking for null values and removing any duplicates.
3. Analyze the data by calculating summary statistics such as mean, median, standard deviation, min and max values for both temperature and humidity.
4. Visualize the data using plotly. Plot temperature and humidity over time in a line chart with different colors for each.
5. Use plotly to create a scatter plot with temperature on the x-axis and humidity on the y-axis. The scatter plot should have color-coded points based on time of day (morning, afternoon, evening, night).
6. Create a heatmap using plotly to visualize the relationship between temperature, humidity, and time of day.