WEATHER CLASSIFICATION BASED ON HO CHI MINH CITY WEATHER DATA

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Chapter 1.
Introduction

1. Introduction

Goal. Develop a weather prediction model by utilizing HCM's 2020 weather data.

Definition.

Input. Time, Temperature, Humidity, Wind, Visibility, etc.

Output. Weather condition status (*e.g., Clear, Partially cloudy, etc.*).

Application. Providing information support for efficient planning in:

- Meeting Schedules
- Event Organization
- Sports Activities, etc.

Chapter 2.
Data Analysis & Preprocessing

2. Data Analysis & Preprocessing

Date time	Temp	Wind Speed	Visibility	Cloud Cover	Relative Humidity	Conditions
1/1/2020 0:00	26	7.6	10	27	67.03	Partially cloudy
1/1/2020 1:00	25.9	9.4	10.2	25.4	73.53	Partially cloudy
1/1/2020 2:00	25	10.1	8	27	71.96	Partially cloudy

8784 samples

7 attributes

Crawl data from

Visual Crossing

80% training data

compared to 20% test data

2. Data Analysis & Preprocessing

Data Cleaning.
Exclude 8 samples with NULL values.

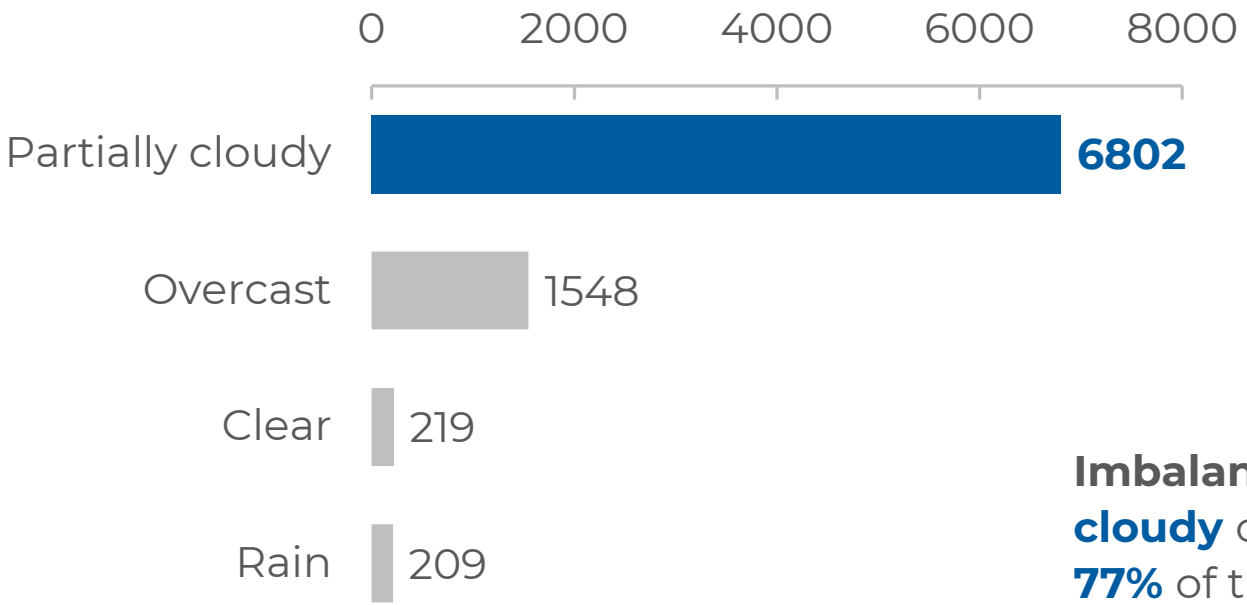
Data Discretization.
Date time and Conditions attributes.

Data Scaling.
Standardization.

2. Data Analysis & Preprocessing

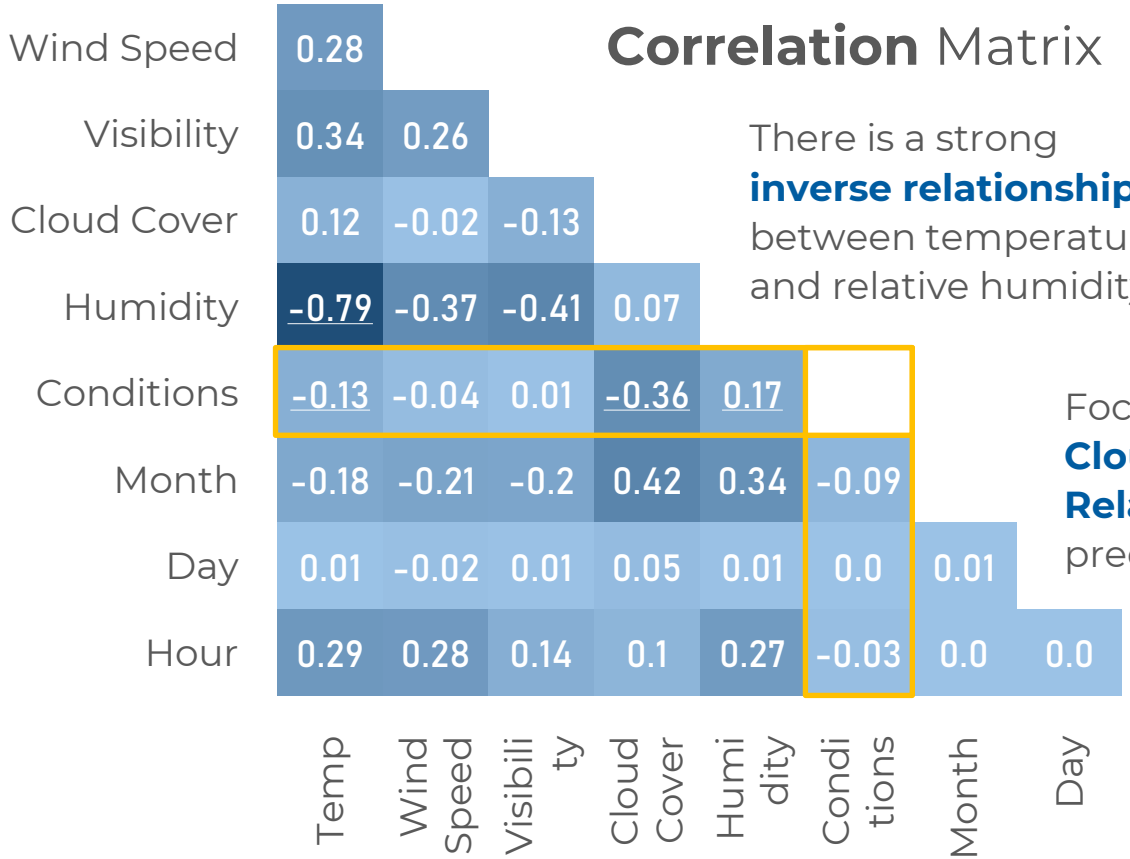
Distribution of Values in the **Conditions** Attribute

Is the dataset **imbalanced** or not?



Imbalanced dataset. **Partially cloudy** comprises slightly over **77%** of the values.

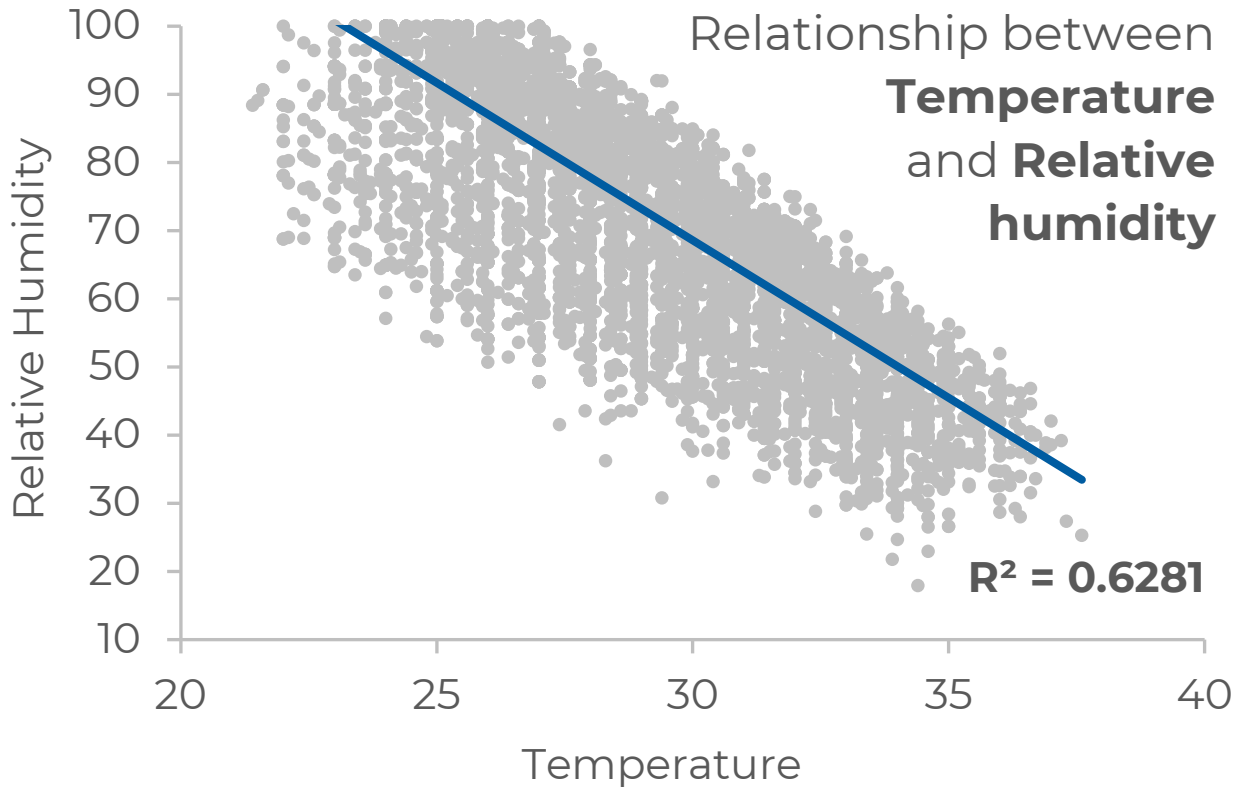
2. Data Analysis & Preprocessing



There is a strong **inverse relationship** between temperature and relative humidity.

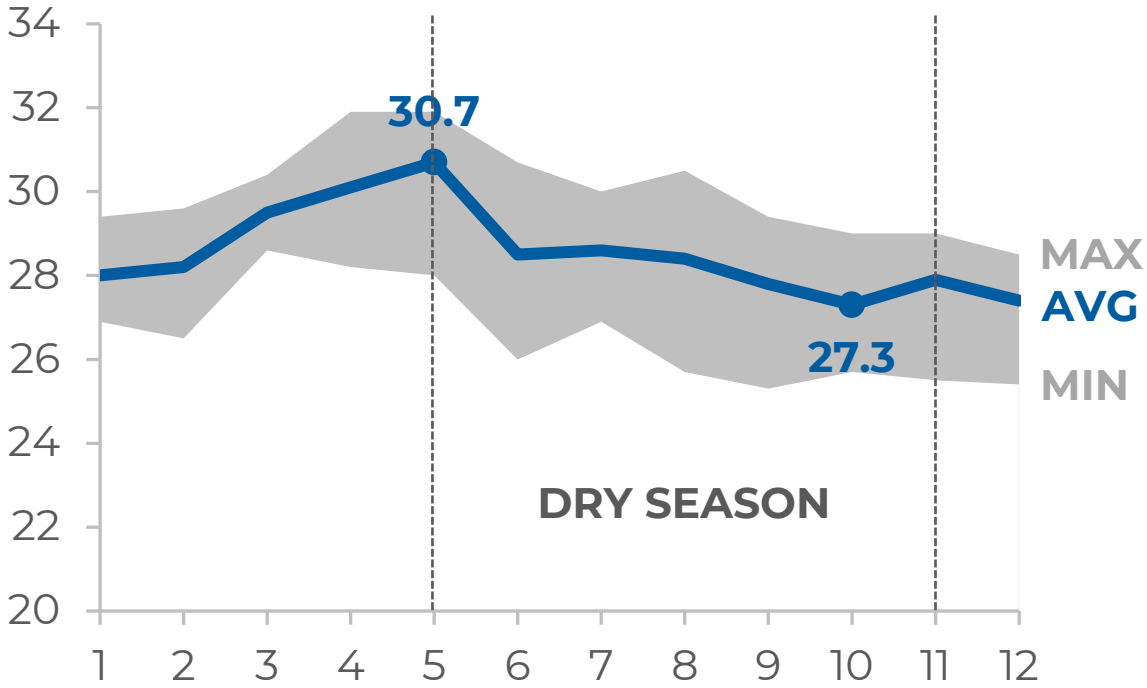
Focus on **Temperature**, **Cloud Cover** and **Relative Humidity** for predicting Conditions.

2. Data Analysis & Preprocessing



2. Data Analysis & Preprocessing

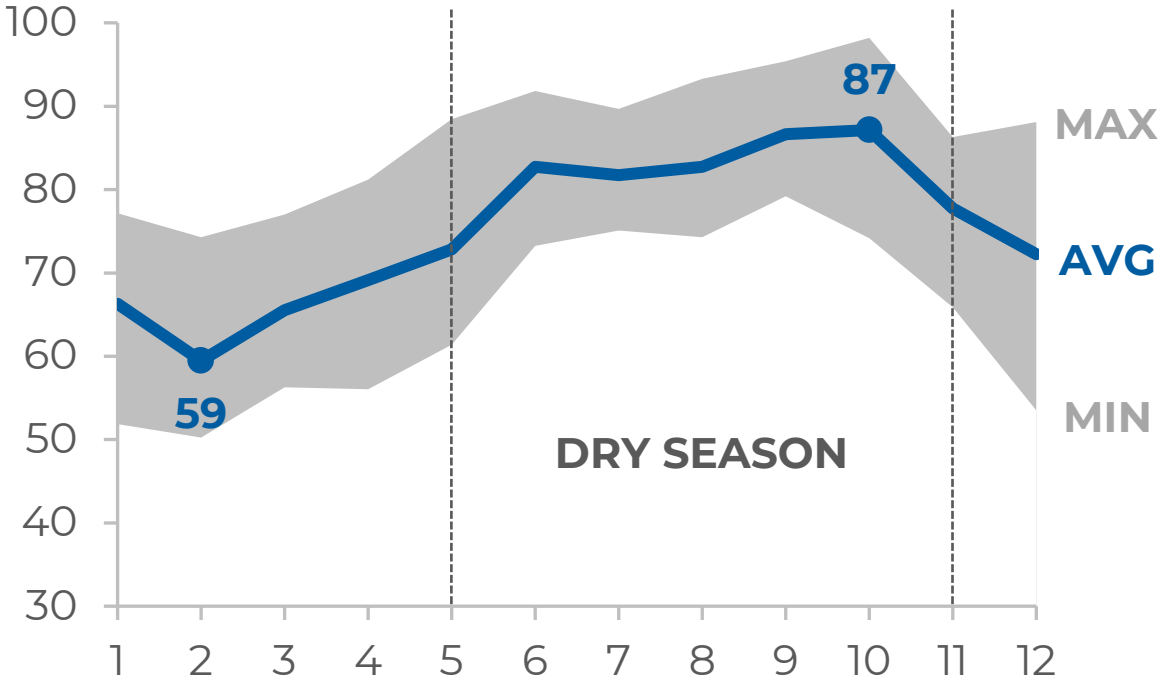
HCMC's 2020 Average Monthly **Temperature**



The city has a **tropical savanna climate** with **high** average temps throughout the year and **distinct** wet/dry seasons.

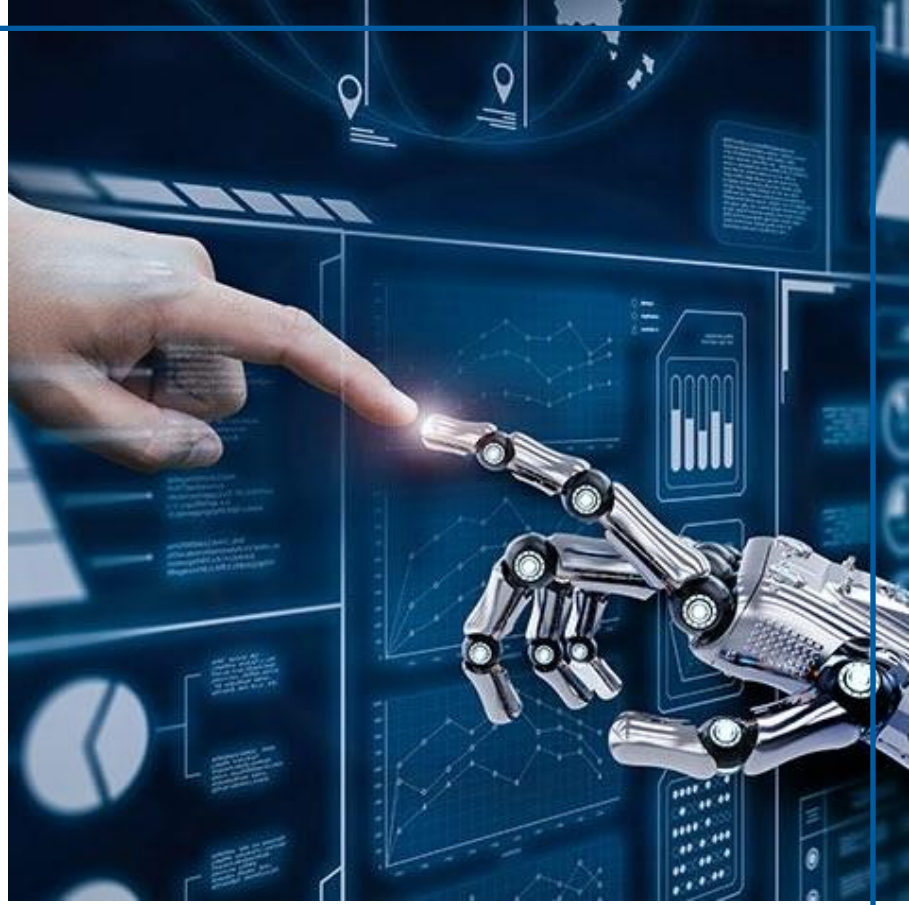
2. Data Analysis & Preprocessing

HCMC's 2020 Average Monthly **Relative Humidity**



The city has a **tropical savanna climate** with **high** moisture content of the air, **humid** in wet seasons, **dry with lower humidity** in dry seasons.

Chapter 3. Building Machine Learning Models



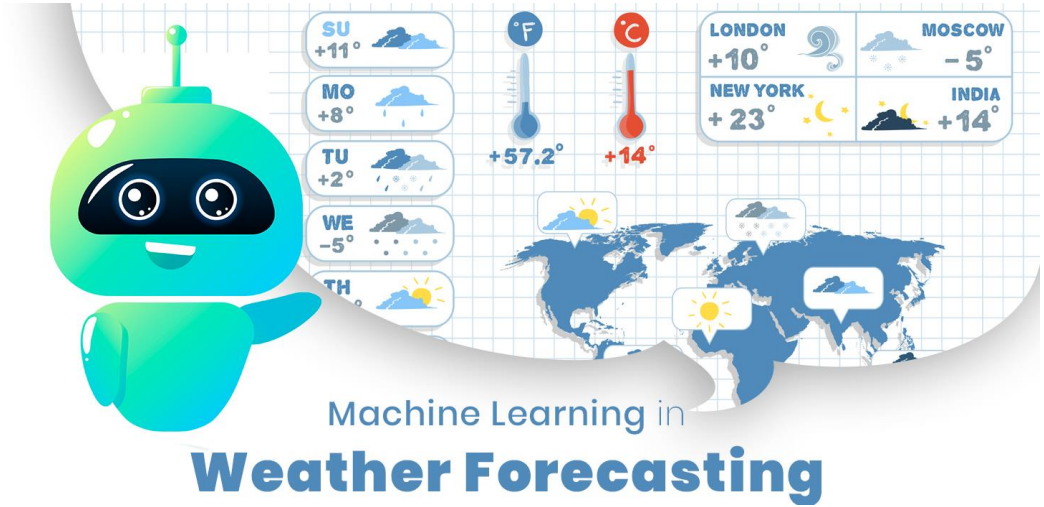
3. Building Machine Learning Models

Model	Macro-average			Weighted-average		
	P	R	F1	P	R	F1
Decision Tree	85.21	89.60	**86.97**	97.83	97.27	**97.51**
Random Forest	92.71	88.82	**90.44**	98.39	98.52	**98.42**
Logistic Regression	73.03	74.98	**73.99**	95.33	97.61	**96.46**
SVM	72.97	73.85	**73.39**	95.22	97.49	**96.34**
K-nearest Neighbor	69.92	67.22	**68.39**	93.58	93.51	**93.52**

04 CONCLUSION

4. Conclusion

- What is **Achieved**?
- What is **Not Achieved**?
- **Future Development** Direction



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Q and A

Questions are
Needed, Really?