Predict weather

rain or snow

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Background

this project is about historical weather around Szeged, Hungary , from 2006 to 2016, we build model that predict will it rain or snow.

Dataset

Public source from Kaggle.

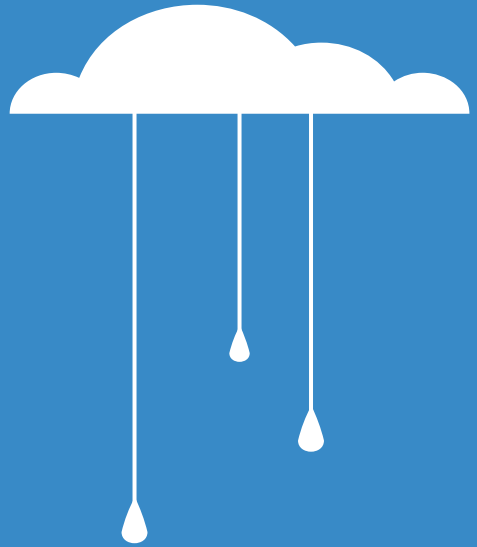
Size

- 96000 records
- 12 columns

Target

PRECIP TYPE

Methodology



01 Understanding the data

02 Gathering data

03 Exploratory Data Analysis

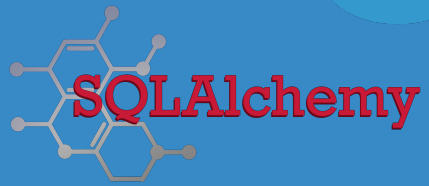
04 Data preparation

05 Classification models

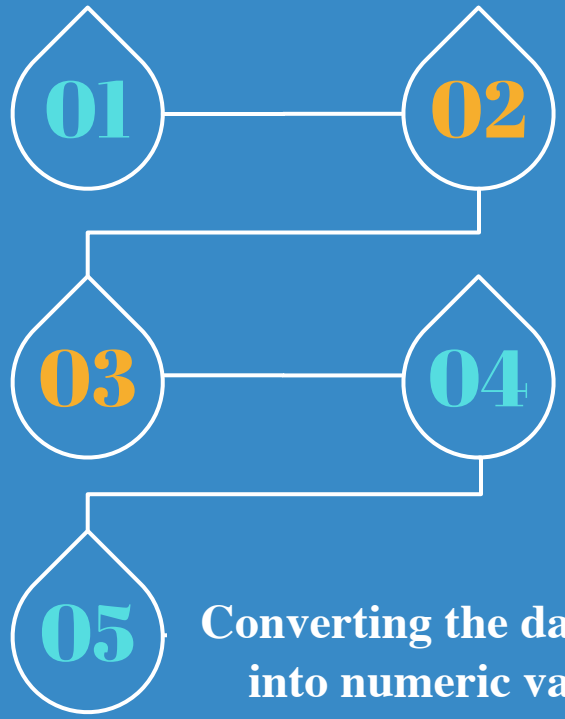
Technologies and libraries

NumPy

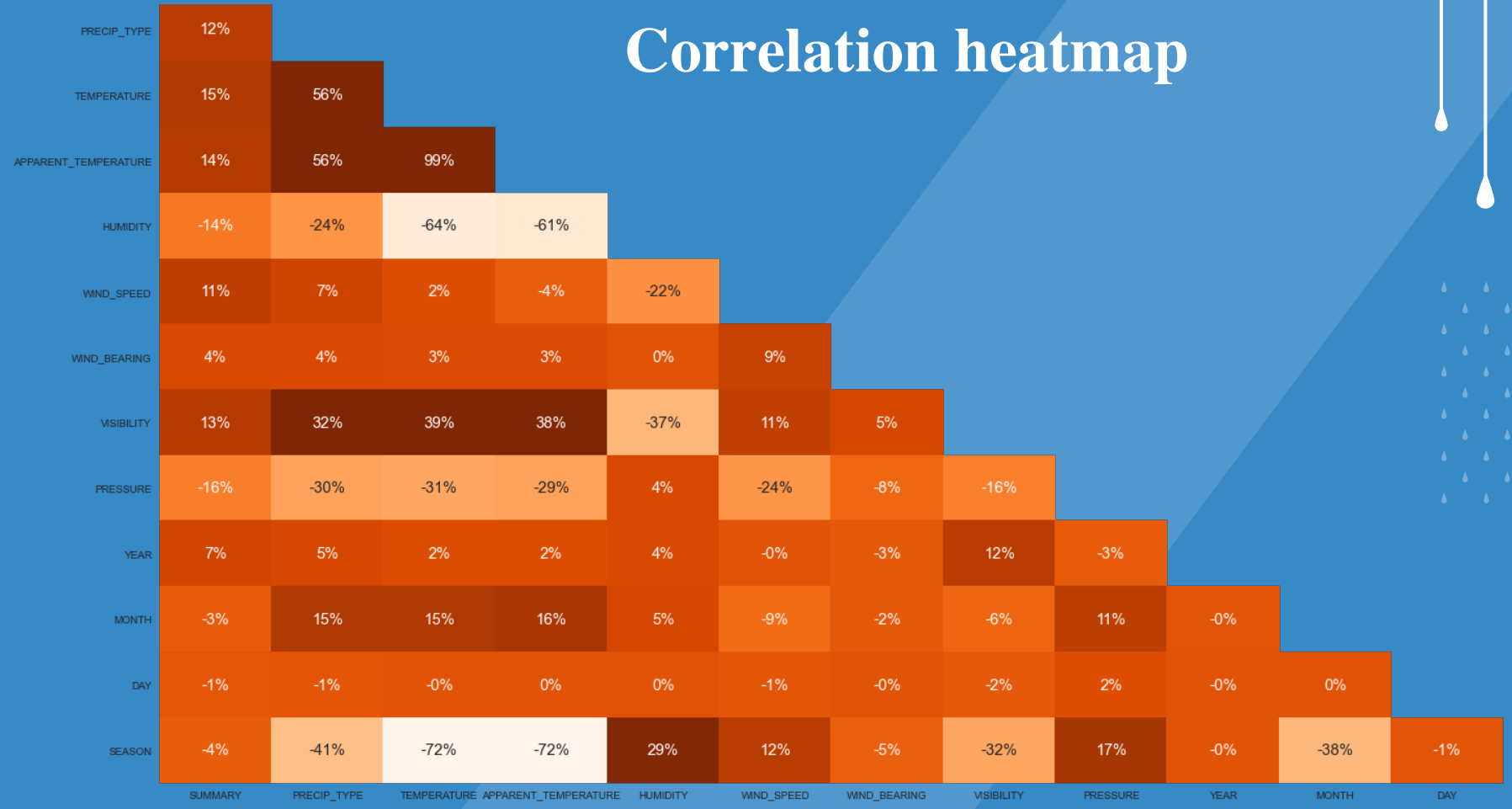
pandas



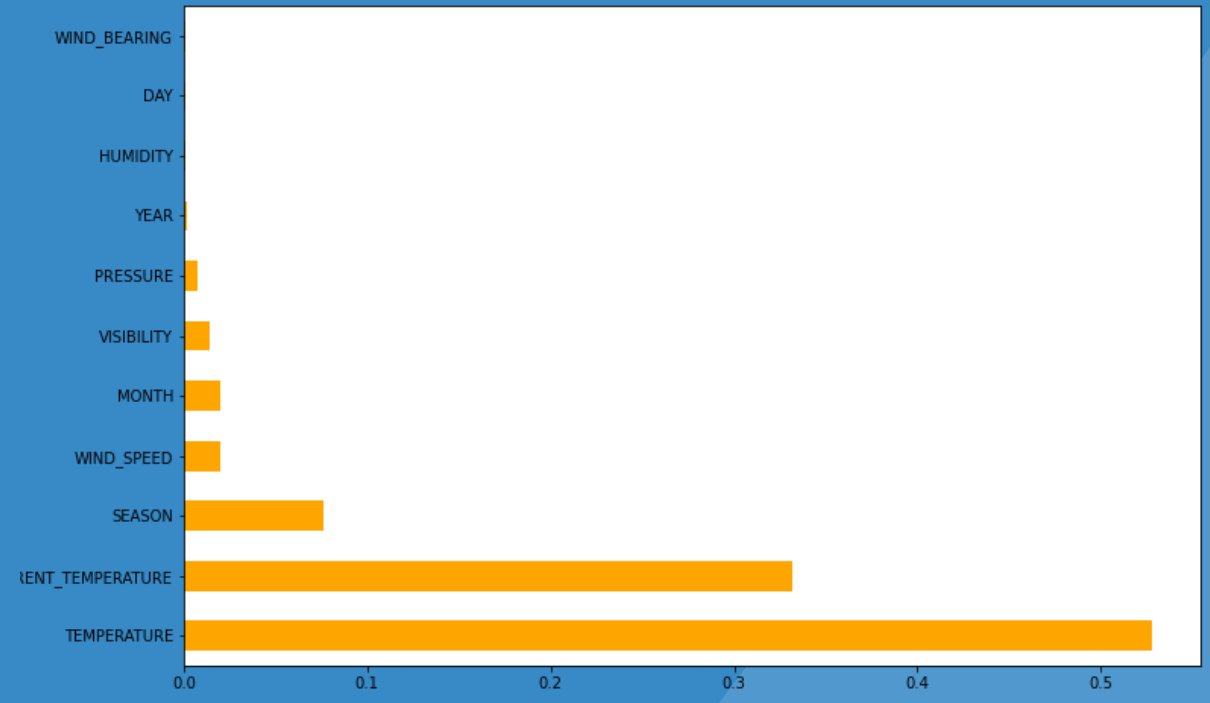
Exploratory Data Analysis



Correlation heatmap



feature importance



According to bar chart,these featurs:

1. TEMPERATURE
2. APPARENT TEMPERATURE
3. SEASON
4. WIND SPEED
5. VISIBILTY
6. MONTH
7. PRESSURE
8. YEAR

Are the most important features in weather predict.

Data Preparation

Feature Selection

- Drops both the ‘loud cover' and the ‘week_day' columns

Feature Engineering

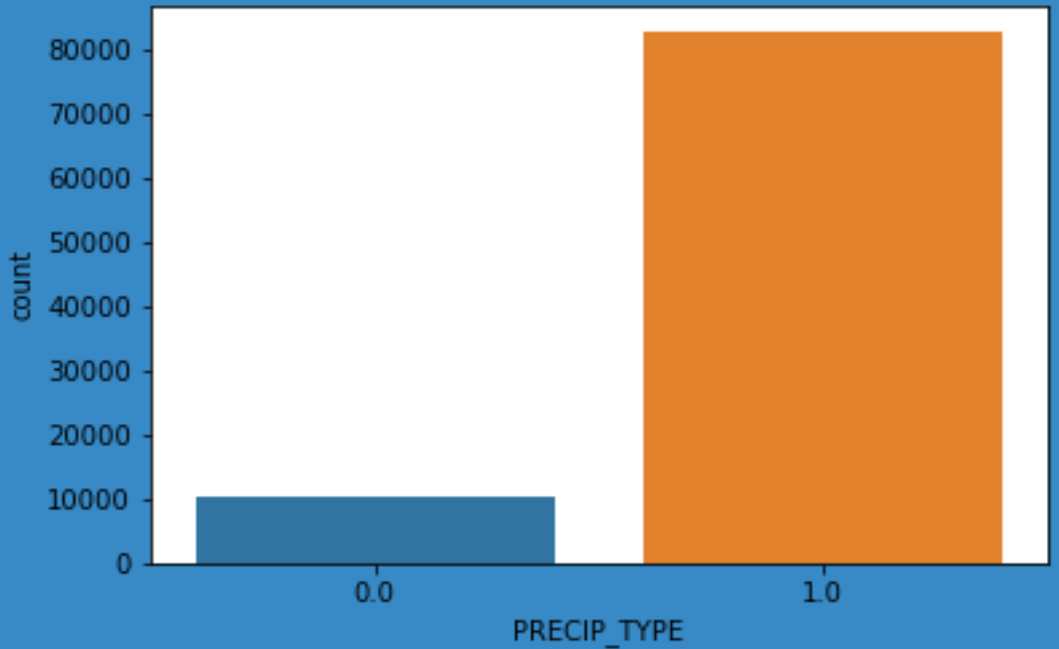
- Add new column (‘SEASON’).
- Encoding the columns into categorical values.
- Scaling using standard Scaler.

Imbalanced dataset

- SMOTE was use for handling the imbalanced

Voting Classifier

Imbalance



There were snow (11.102%) and rain (88.898%).

SMOTE

SNOW: 83010
RAIN: 83010

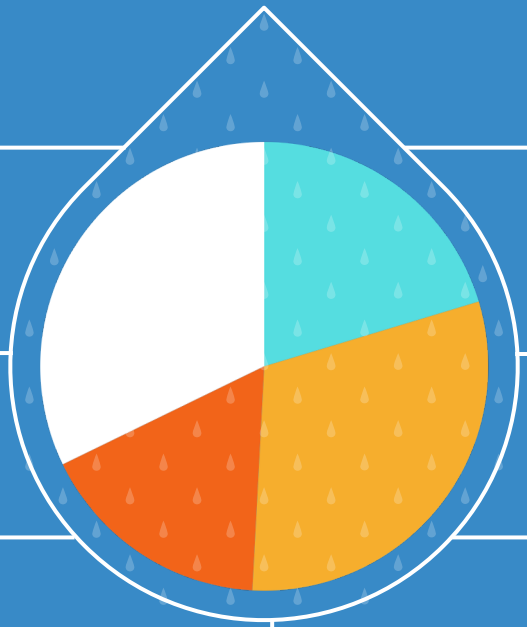
ADAYSN

SNOW: 81040
RAIN: 81348

RANDOM OVER SAMPLER

SNOW: 81348
RAIN: 81348

Classification models



Logistic Regression

Decision Tree

(k- Nearest Neighbors)

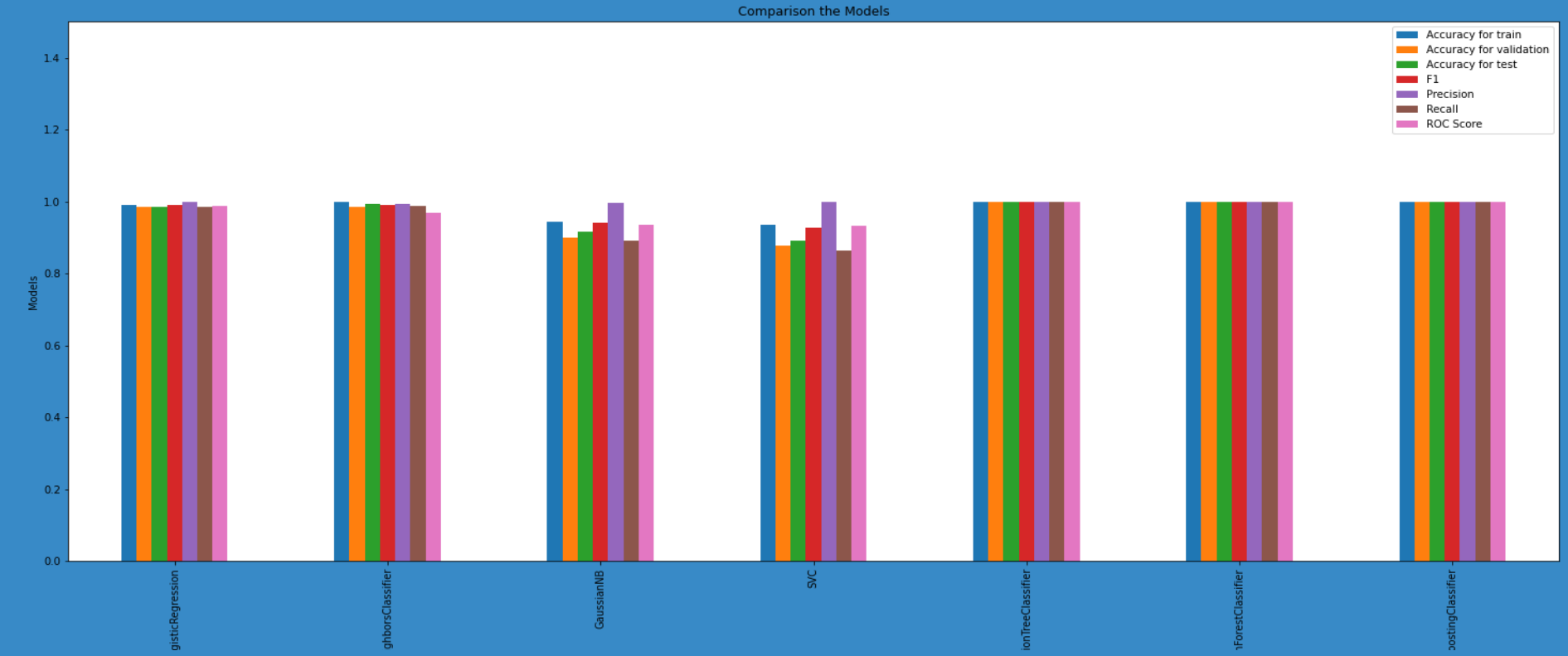
Random Forest

Gaussian Naive Bayes

Gradient Boosting

Support Vector Machine
(SVM)

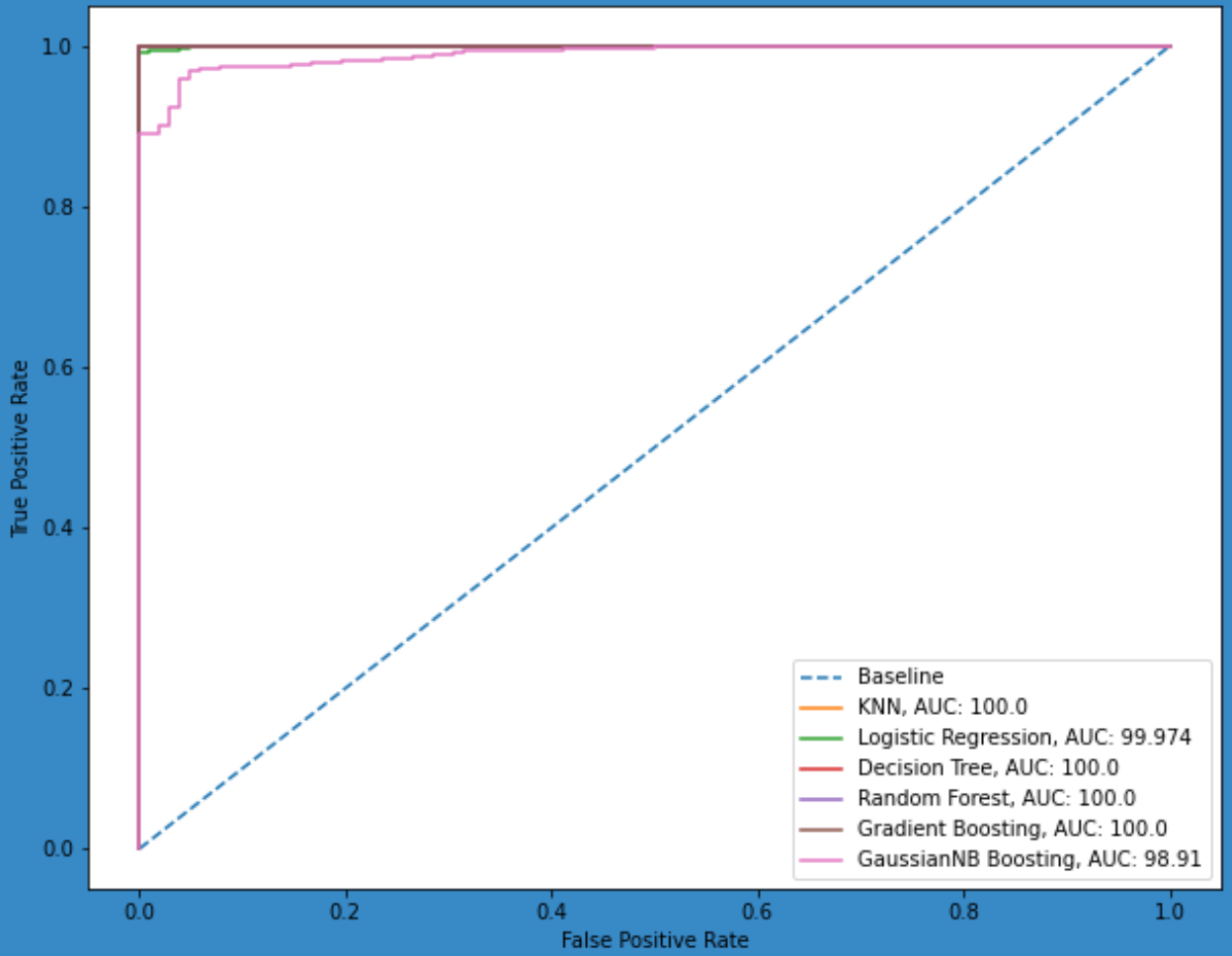
Comparison the Models



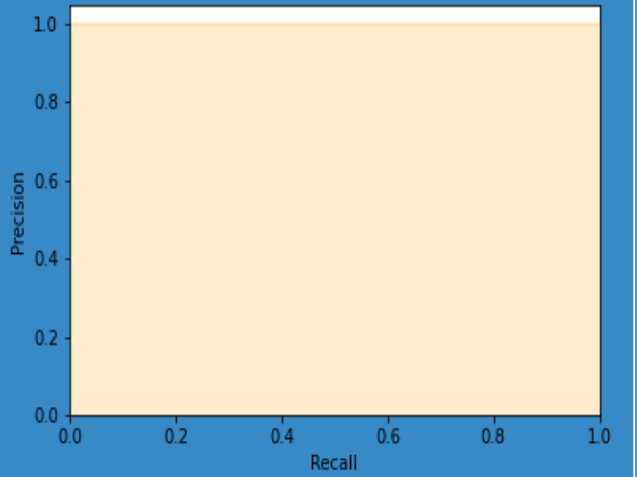
Classification models

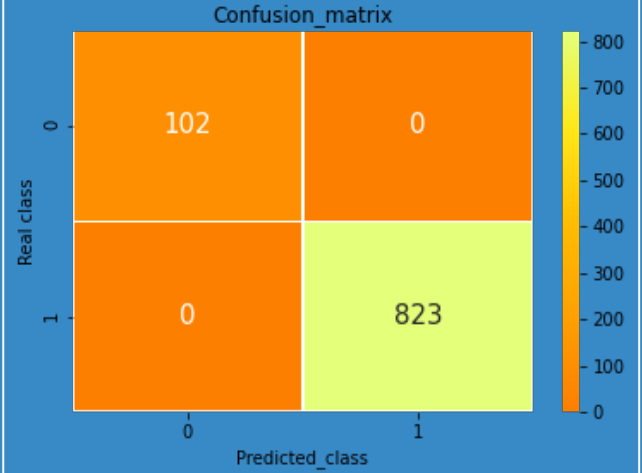
	Precision	Recall	F1	Accuracy
Logistic Regression	1.00	0.9927	0.9963	0.9935
Nearest Neighbors	0.9939	0.9891	0.9915	0.9848
Decision Tree	1.00	1.00	1.00	1.00
Gradient Boosting	1.00	1.00	1.00	1.00
Random Forest	1.00	1.00	1.00	1.00

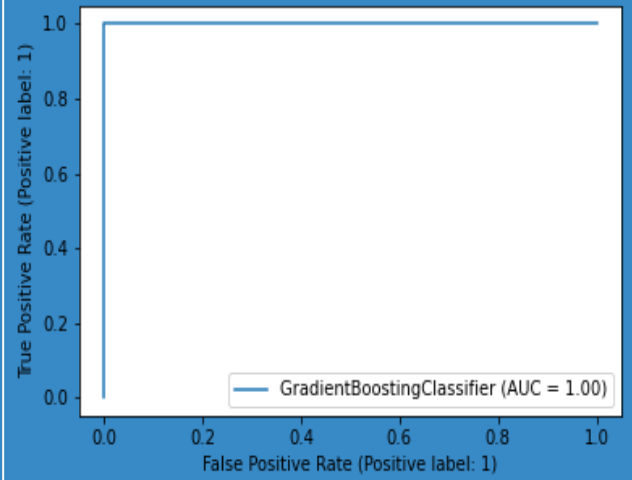
ROC Curve


True Positive Rate
False Positive Rate
0.0
0.2
0.4
0.6
0.8
1.0
Baseline
KNN, AUC: 100.0
Logistic Regression, AUC: 99.974
Decision Tree, AUC: 100.0
Random Forest, AUC: 100.0
Gradient Boosting, AUC: 100.0
GaussianNB Boosting, AUC: 98.91

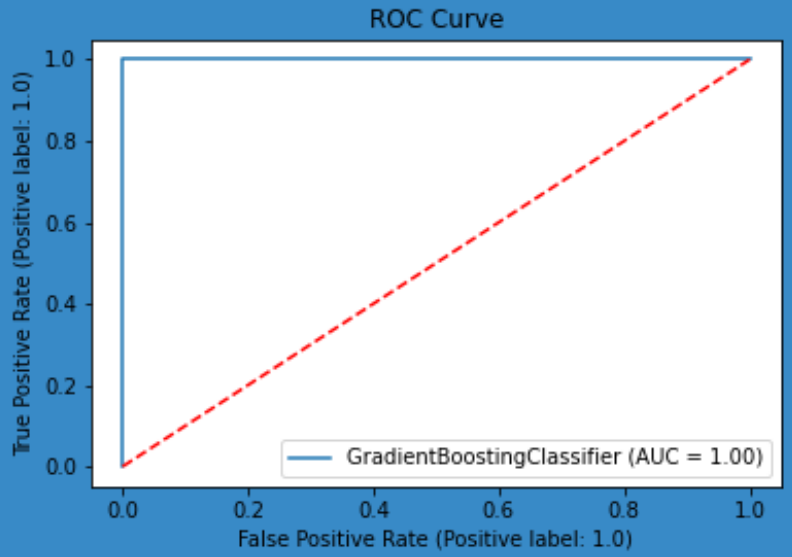
Gradient Boosting Model

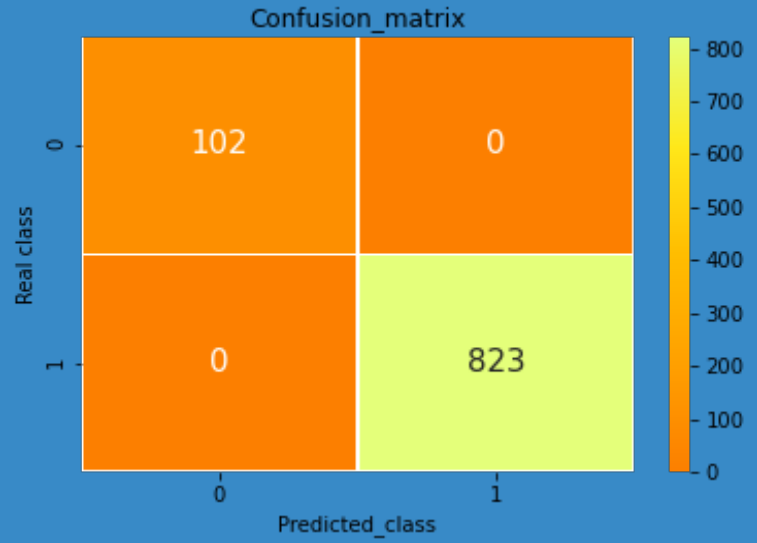






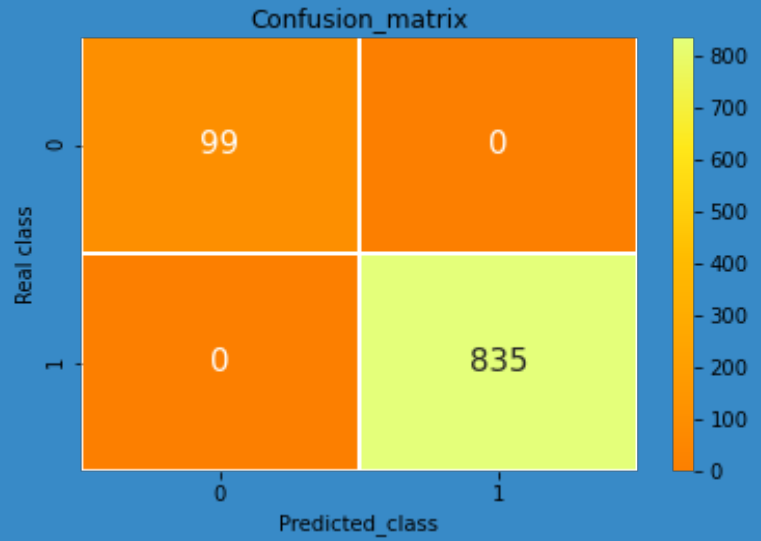
Gradient Boosting (test)





	Precision	Recall	F1	Accuracy
Gradient Boosting	1.0	1.0	1.0	1.0

Voting Classifier (test)



	Precision	Recall	F1	Accuracy
Voting Classifier	1.0	1.0	1.0	1.0

Future Works

- Another dataset / Scraped dataset
- Feature Engineering (add new column)

THANKE YOU !