Classification of Cities and Regions of Saudi Arabia in 2021 in the spread of COVID-19 between regions with high, and low

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Outline

- Objective
- Problem
- Contribution
- MLP Classifier Algorithm
- Visualisation
- Result
- Conclusion

Objective

- Classify Saudi Arabia's regions as high, or low in terms of the spread of COVID-19 in each region from January 1st to October 6th, 2021.

Problem As a Question

- What are the cities most likely to spread to COVID-19?
- Does urbanization contribute to the spread of COVID-19, as in busy-main cities such as Al Madinah Al Munawwarah city?
- Do working days or holidays contribute to the spread of COVID-19?

Contribution

- A great benefit for doctors and tourists in that it contributes to help the Saudi Ministry of Health to take procedures regarding areas or cities where the virus spread is very high.

MLP algorithm

- MLP is a multiple feed forward artificial neural network that maps input vectors to output vectors.
- **Parameters:**
- Alpha→ float , regularization term.
- max_iter → int, Maximum number of iterations.

Why I used MLP Algorithm ?

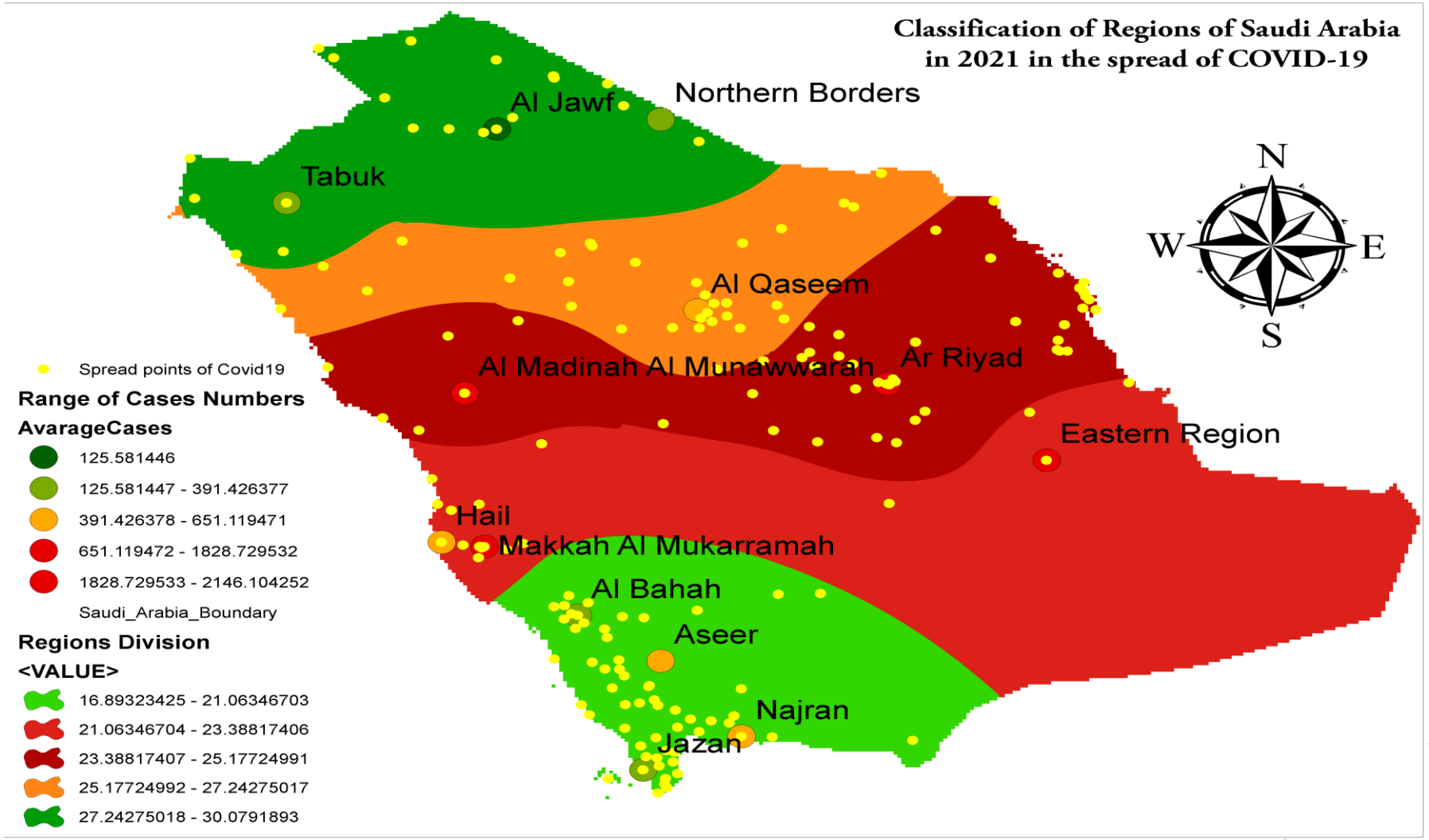
- **MLP are applied In my experiment dataset perform reliable and show promising results.**
- My model provides important aid in addressing the real-world crisis in the face of COVID-19, and this is the need to know the critical category classification "HIGH".

Metrics	MLP	KNN	SVM
Accuracy	100%	56.40%	95.6%
f1-score	1.00	0.52	0.65
precision	1.00	0.47	0.48
Recall	1.00	0.48	1.00

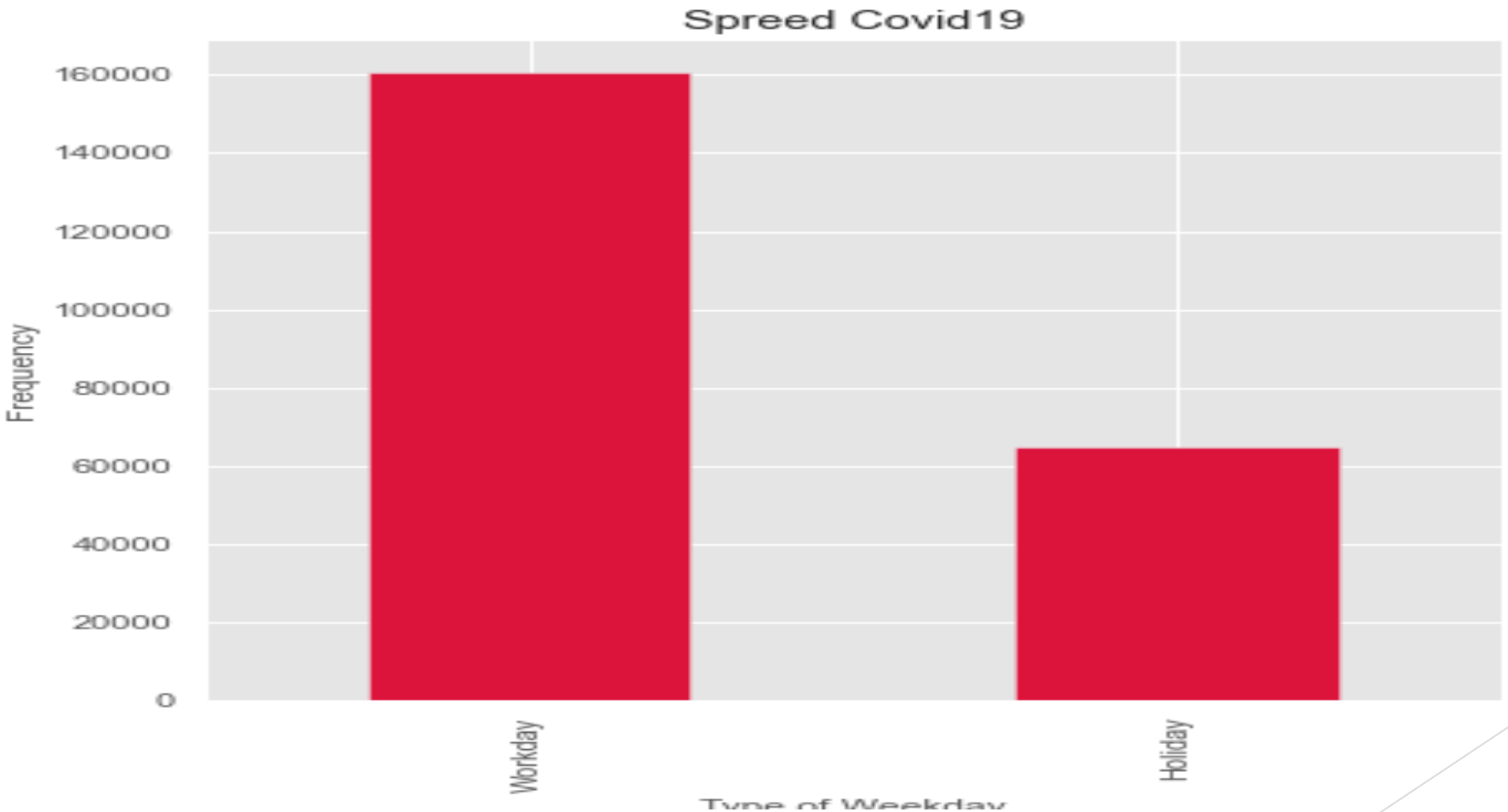
Dataset

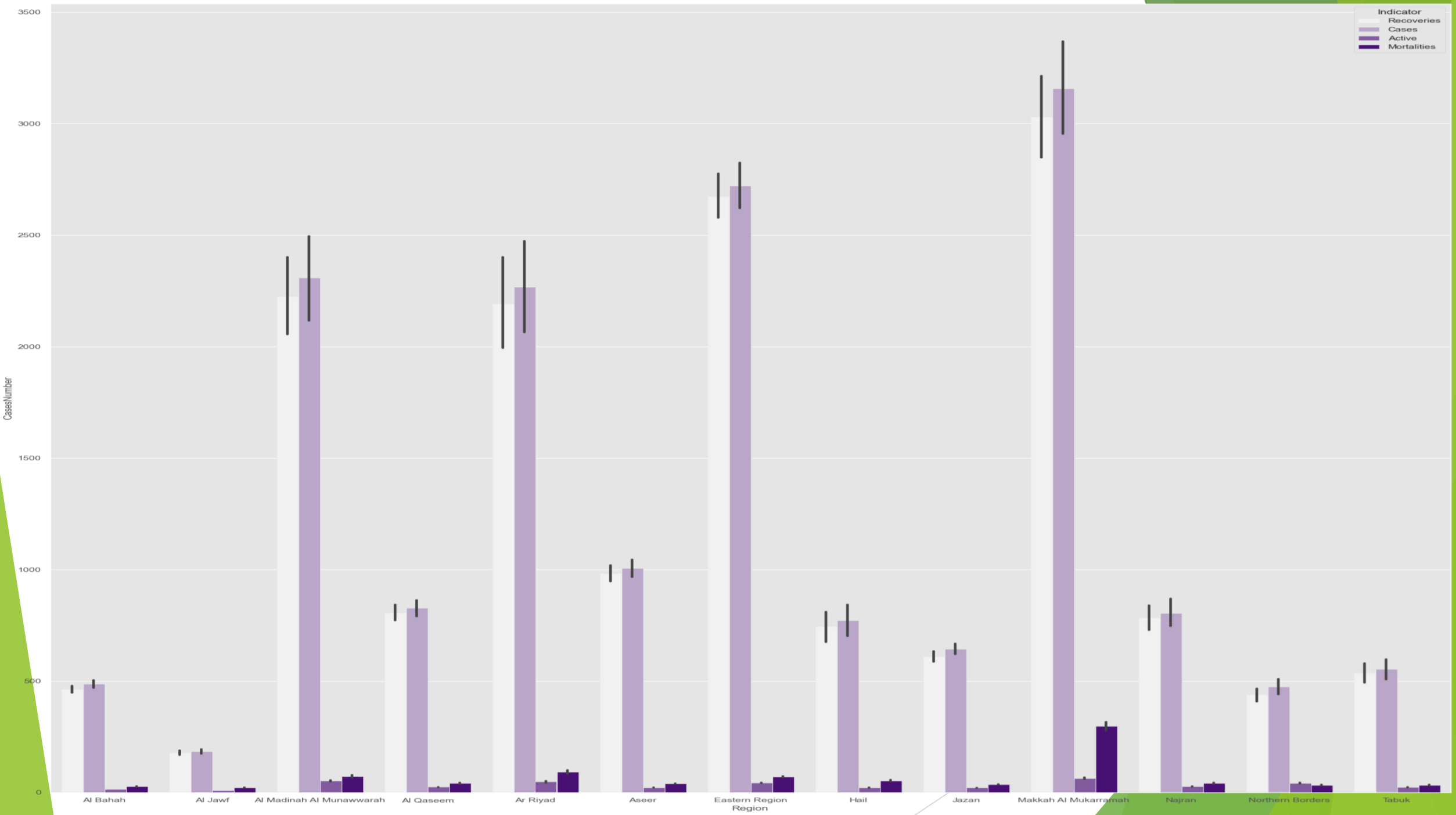
- I used a dataset from "the King Abdullah Center for Petroleum Studies and Research "website which included around 13 regions and 102 cities.
- Link of my dataset
- https://github.com/naz50/MVP/blob/main/NuhaDBooo.csv

Explore Data Analysis



Explore Data Analysis



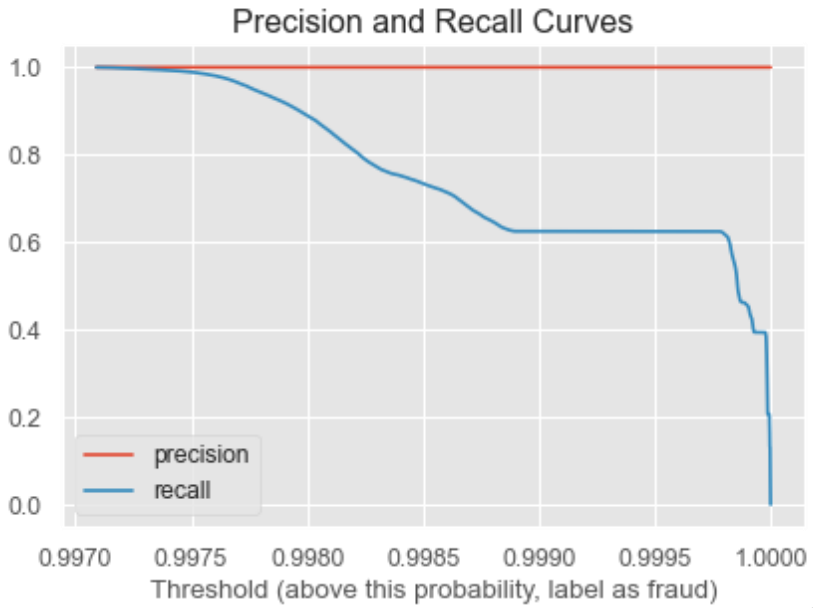

Indicator
Recoveries
Cases
Active
Mortalities
CasesNumber
3500
3000
2500
2000
1500
1000
500
0
Al Bahah
Al Jawf
Al Madinah
Al Munawwarah
Al Qaseem
Ar Riyad
Aseer
Eastern Region
Hail
Jazan
Makkah Al Mukarramah
Najran
Northern Borders
Tabuk
Region

Applying MLP(Result)

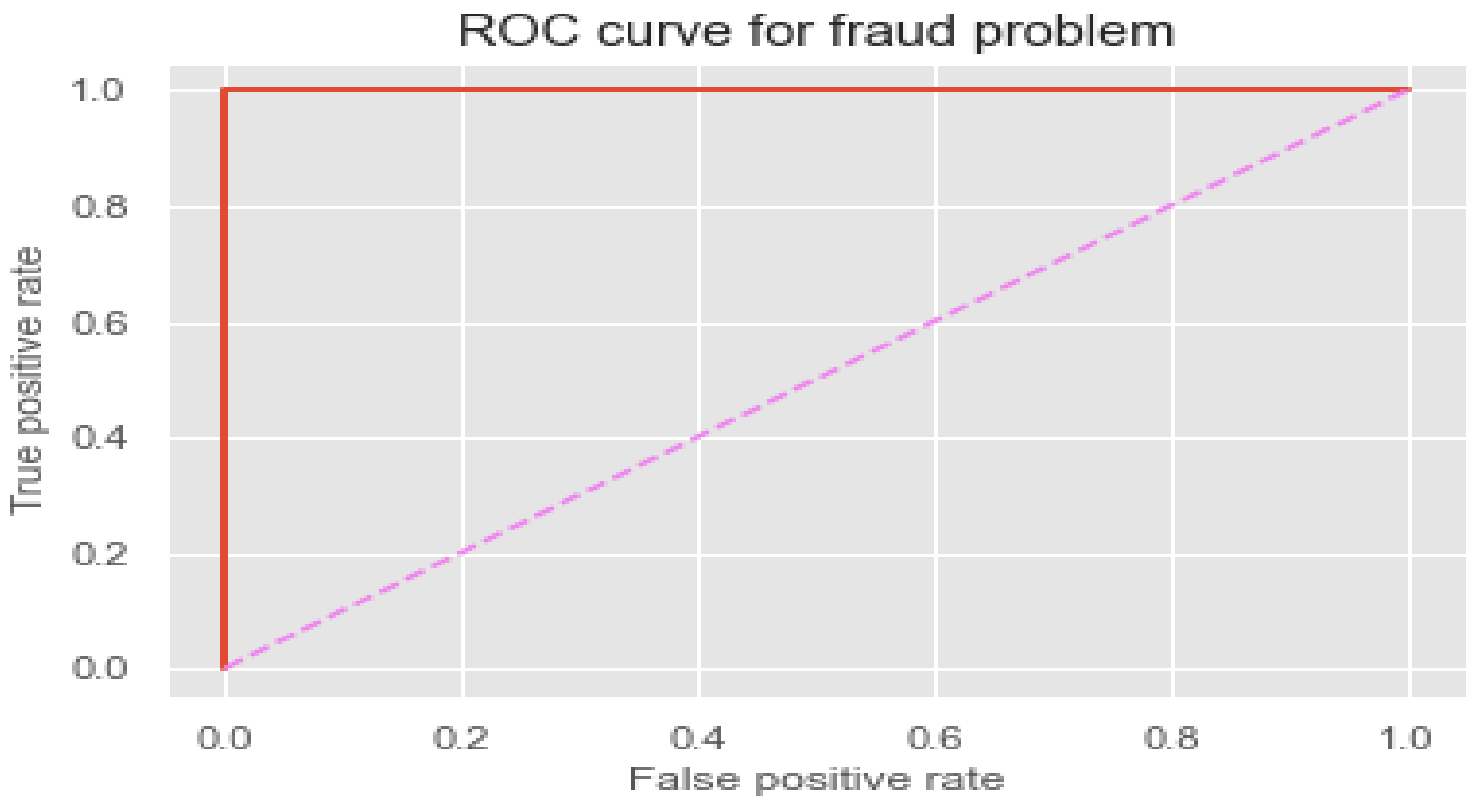
Classification report

	precision	recall	f1-score	support
0	1.00	1.00	1.00	27100
1	1.00	1.00	1.00	29293
accuracy			1.00	56393
macro avg	1.00	1.00	1.00	56393
weighted avg	1.00	1.00	1.00	56393

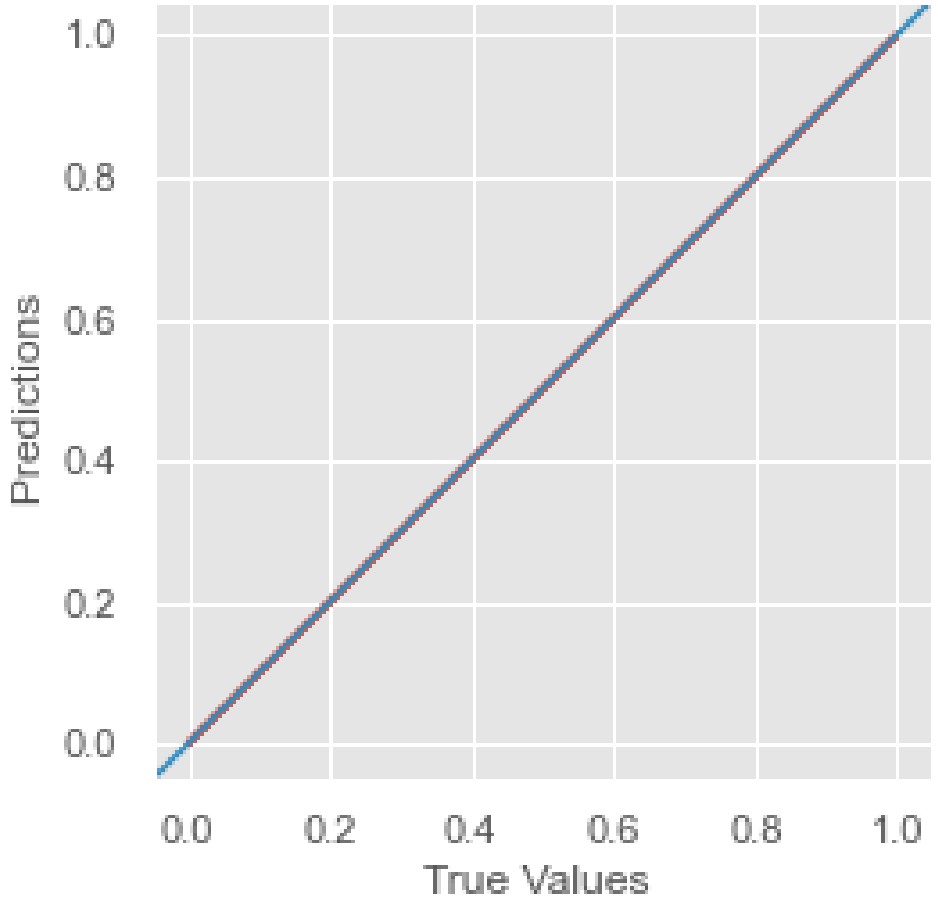
Precision and Recall Curves



ROC curve for fraud problem test



True Values vs. Predictions



Conclusion

- My experimental is achieved promising results for this global crisis.

- I Conclude that there is an increase in the spread of COVID-19 cases in the working days compared to the holidays.

- There is an increase in the number of cases of COVID-19 and deaths in main-busy cities and regions such as Ar Riyadh, Makkah Al Mukarramah, and Al Madinah Al Munawwarah compared to other cities such as Al-Jawf.

THANK YOU ☺✿