Syria Telecommunications Customer Churn Project

Business Understanding

Established in 2000

SyriaTel is a mobile network operator that has played a pivotal role in developing Syria's telecommunications infrastructure, providing comprehensive coverage to both urban and rural areas.

Diverse Service Offerings

The company offers a wide range of telecommunication services, including mobile voice, data, and internet, focusing on enhancing customer experience through innovative solutions and competitive pricing.

Challenges Amid Conflict

Despite the ongoing conflict and economic difficulties in Syria, SyriaTel has maintained its operations and continues to invest in network expansion and technological upgrades.

Mission to Connect and Improve

SyriaTel's mission is to connect people and improve lives by providing reliable and affordable telecommunication services, contributing to the socio-economic development of Syria.

Business Problem and Objectives

1

Predict Customer Churn

The primary objective is to build a machine learning model that can accurately predict whether a customer will soon stop doing business with SyriaTel. This will help the company take proactive measures to retain customers and minimize revenue loss.

2

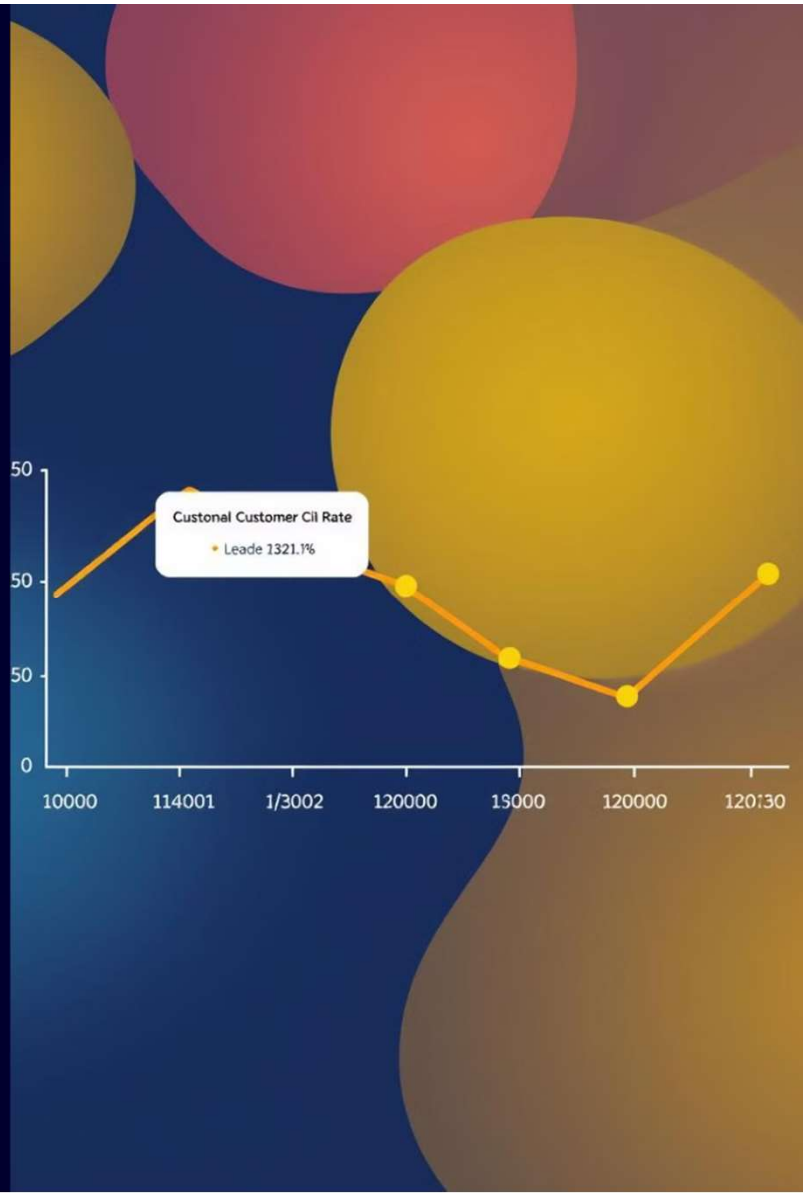
Identify Churn Drivers

The second goal is to analyze the factors that contribute to high customer churn, allowing SyriaTel to address the underlying issues and implement targeted strategies to improve customer retention.

3

Analyze Churn Trends

The final objective is to examine churn trends across different states in Syria, enabling SyriaTel to understand which regions are more susceptible to high churn rates and tailor its efforts accordingly.



Data Understanding

Dataset Overview

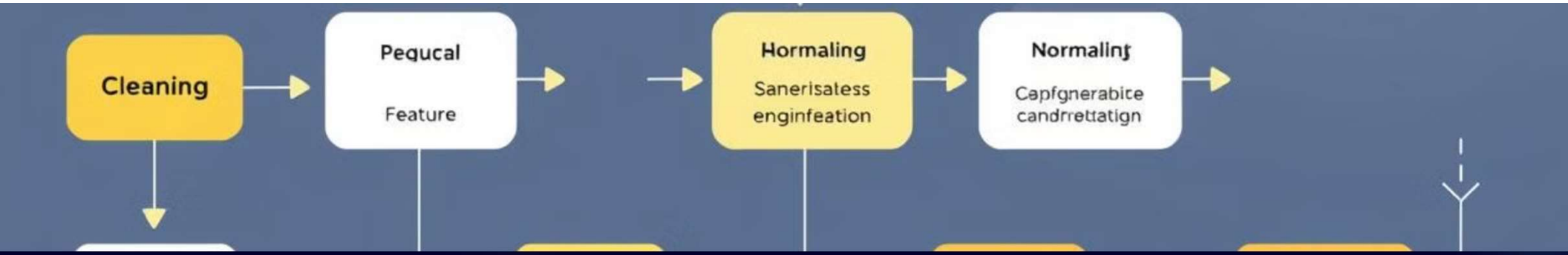
The dataset includes information on various customer attributes, such as account length, area code, international plan, voice mail plan, usage minutes, and customer service calls. The target variable, "churn," indicates whether a customer has left the company (True) or not (False).

Categorical Variables

The dataset contains three categorical variables: state, international plan, and voice mail plan. These variables will be encoded using one-hot encoding to prepare them for modeling.

Numerical Variables

The numerical variables include account length, number of voice mail messages, customer service calls, total minutes, total charges, and total calls. These continuous variables will be used as features in the predictive model.



Data Preprocessing

Handling Missing Values

1

The dataset was checked for any missing values, and it was found that there were no missing values in the dataset. This means that no additional preprocessing steps were required to handle missing data.

Feature Engineering

2

To create more informative features, the total day, evening, night, and international minutes, calls, and charges were combined into single "total" features, providing a more comprehensive view of customer usage patterns.

Encoding Categorical Variables

3

The categorical variables were encoded using one-hot encoding, creating binary columns for each unique category. This allows the machine learning models to effectively utilize the information contained in the categorical features.

Modeling and Evaluation

1 Logistic Regression

A Logistic Regression model was trained on the preprocessed data, providing a baseline for the churn prediction task. The model achieved an accuracy of 85% on the test set, indicating a significant improvement over the dummy model.

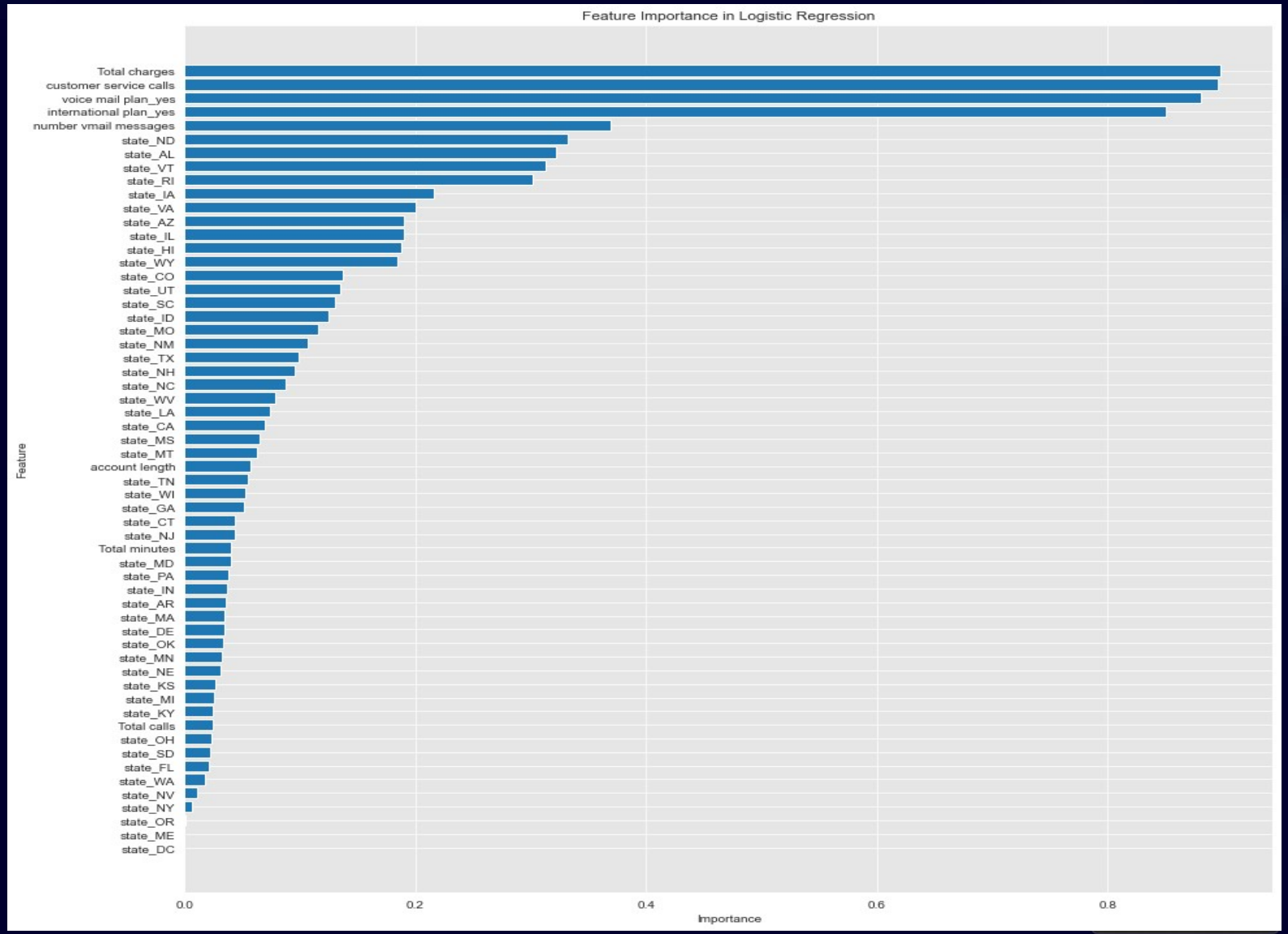
2 Decision Tree Classifier

A Decision Tree Classifier was also evaluated, and it outperformed the Logistic Regression model, achieving an accuracy of 91.9% on the test set. The Decision Tree model demonstrated a better balance between precision and recall, making it the preferred choice for this project.

3 ROC Curve and AUC

The ROC curve and AUC (Area Under the Curve) metric were used to further evaluate the model's performance. The AUC of 0.82 indicates that the model has a good ability to distinguish between customers who will churn and those who will not.

A graph on how different features can affect customer churn



Key Drivers of Customer Churn

Total Charges

The most important feature in predicting churn is the total charges incurred by the customer. Customers with higher total charges are more likely to churn, suggesting that SyriaTel should consider offering targeted discounts or loyalty rewards to high-billing customers.

Customer Service Calls

The number of customer service calls made by a customer is also a significant predictor of churn. Customers with a high number of service calls are more likely to leave, indicating that SyriaTel should focus on improving customer service quality and proactively addressing customer issues.

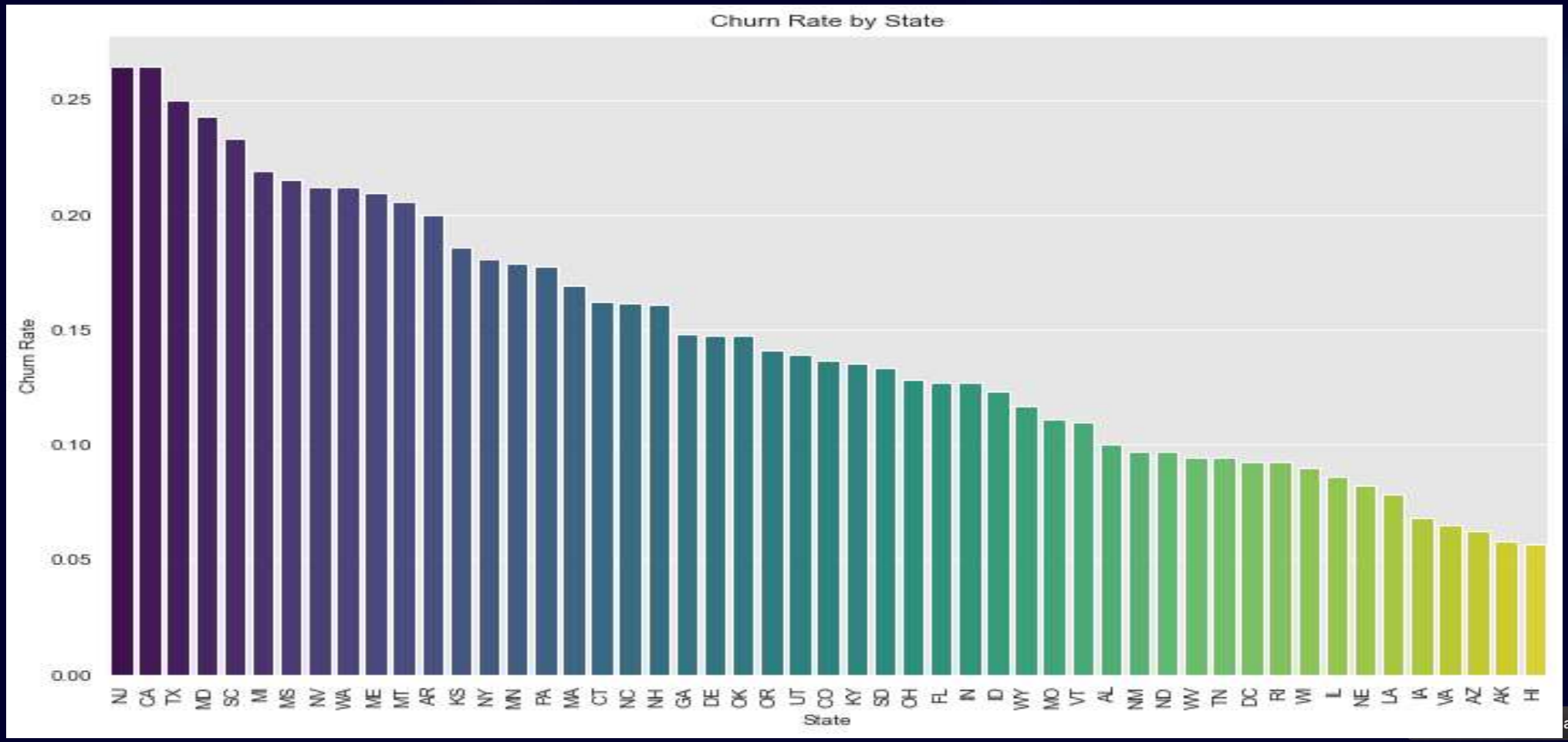
Voice Mail and International Plans

The presence of a voice mail plan or international plan is correlated with a higher likelihood of churn. SyriaTel should re-evaluate the pricing and value proposition of these plans, as well as consider offering better-bundled services to encourage customers to retain these features.

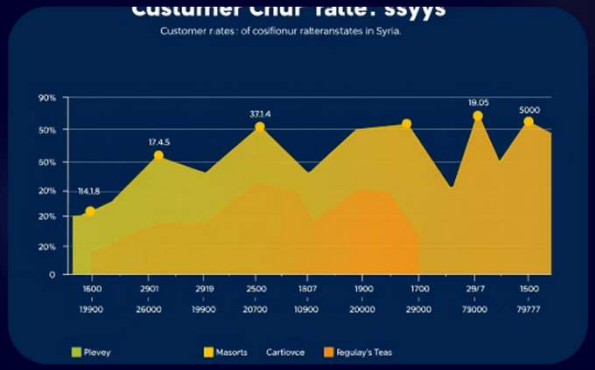
Voicemail Messages

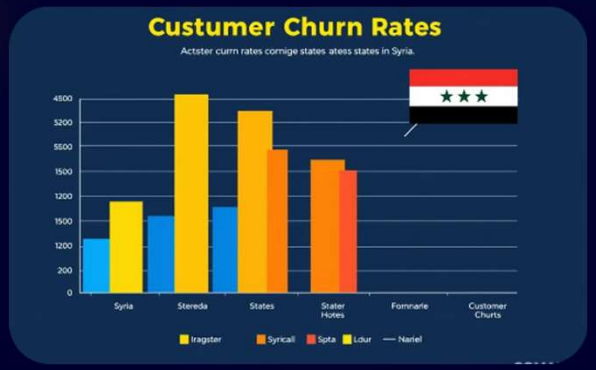
The number of voicemail messages a customer has is another important factor in predicting churn. SyriaTel should educate customers about more efficient communication methods and provide incentives for adopting newer technologies.

A graph on Churn Trends Across States



Churn Trends Across States





High Churn States

States like New Jersey, California, and Texas have the highest churn rates, exceeding 20%. These are critical areas where SyriaTel should prioritize targeted retention strategies to address the underlying issues driving customer attrition.

Moderate Churn States

Several states have moderate churn rates, ranging between 10% and 20%. While not as severe as the high churn states, these regions still represent a concern and require close monitoring and proactive measures to prevent further increases in churn.

Low Churn States

States like Hawaii, Alaska, and Arizona have the lowest churn rates, typically below 10%. These areas may have better customer satisfaction, superior service quality, or less intense competition, and their successful strategies could be applied to other regions.

Recommendations

1

Implement Targeted Retention Strategies

SyriaTel should prioritize states with the highest churn rates and implement targeted retention strategies, such as improving service quality, enhancing customer support, or offering special promotions to retain customers.

2

Investigate High Churn Areas

For states with exceptionally high churn rates, SyriaTel should conduct further investigations to identify the specific reasons for churn, leveraging customer surveys, feedback, and competitive analysis to gain insights.

3

Leverage Low Churn States

SyriaTel should study the factors contributing to customer retention in states with low churn rates and apply successful strategies to other regions, such as strong network coverage, excellent customer service, or attractive pricing models.

Conclusion

Targeted Retention

SyriaTel should prioritize states with the highest churn rates and implement targeted retention strategies to address the underlying issues driving customer attrition.

Investigate Churn Drivers

For regions with exceptionally high churn rates, SyriaTel should conduct in-depth investigations to identify the specific factors contributing to customer loss.

Leverage Best Practices

SyriaTel should study the successful strategies used in low churn states and apply them to other regions to improve customer retention across its operations.

Continuous Monitoring

Ongoing monitoring of churn rates and adapting strategies to changing market conditions will be crucial for SyriaTel to maintain a stable and loyal customer base.

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THANK YOU