Telecom Churn Analysis and Prediction

Objective and Business Context

Objective

- To identify factors driving customer churn.
- To predict customers likely to churn and implement strategies for retention.

Business Context

• Churn is a significant problem in the telecom industry, leading to revenue loss and increased acquisition costs.

• Retention strategies based on predictive insights can improve customer loyalty and reduce operational costs.

Data Insight

Dataset Overview :

1. Total records: 99999 customers
2. Features: Include customer demographics, account details, services subscribed, and churn status.

Key Observations:

Higher churn rates observed among customers:
1. Using month-to-month contracts.
2. With higher billing amounts.
3. Without additional services like tech support.

Visual Insights:

• Bar Chart: Distribution of churn across contract types.

Predictive Analysis

	Model	precision	recall	f1_score	roc_auc
0	LogisticRegression	0.091931	0.560166	0.157941	0.575711
1	DecisionTree	0.336904	0.717842	0.458582	0.851062
2	RandomForest	0.586271	0.655602	0.619001	0.924402
3	GradientBoosting	0.483261	0.688797	0.568007	0.919795
4	XGBoost	0.656098	0.558091	0.603139	0.929580

The randomforest worked well on this data in churn with precision close to 59%, recall close to 65% and f1_score close to 61%.

Visual Insights:

• Confusion matrix: Breakdown of predictions vs actual outcomes.

• ROC Curve:Comparison of model performance.

Conclusion

• Average revenue per user more, those are likely to churn if they are not happy with the network.
• Local calls minutes of usage has also impact on churn.
• Large difference between recharge amount between 6th and 7th month, also impact churn.
• Users who are using more Roaming in Outgoing and Incoming calls, are likely to churn. Company can focus on them too.

Business Recommendations

Retention Strategies:

• Introduce loyalty programs for long-term contracts.
• Bundle services to increase value perception.
• Offer proactive tech support to high-risk customers.

Operational Insights:

• Focus retention efforts on customers identified as high-risk by the model.
• Regularly monitor churn metrics and model performance.