ASSIGNEMENT-4

4.Take one domain and build Business Understanding.

Domain: Telecom Industry

Problem: Customer Churn Prediction

1.Business Understanding

Problem Statement

- Telecom companies provide mobile and internet services to customers. Some customers discontinue their services and switch to competitors. This is known as **customer churn**, which results in revenue loss and reduced profitability.

Business Objectives

- Identify customers who are likely to churn.
- Reduce overall churn rate.
- Improve customer retention strategies.
- Increase customer lifetime value (CLV).
- Improve customer satisfaction.

Preventive Actions:

- Offering personalized discounts.
- Providing better service plans.
- Proactive customer support.
- Loyalty and retention programs.

Stakeholders

- Customers
- Marketing team
- Customer retention team
- Sales department
- Top management
- Data science team
- IT & DevOps team

Business Success Criteria

- Reduce churn rate by 15–25%.
- Increase customer retention rate.
- Improve customer satisfaction score (CSAT).
- Increase revenue stability.
- Improve long-term customer lifetime value.

2. Assess Situation

Inventory of Resources

- Historical customer usage data
- Billing and payment history
- Customer service interaction records
- Demographic data
- CRM and marketing tools
- Data science team
- IT infrastructure (cloud, servers, databases)

Requirements

- Accurate identification of high-risk churn customers.
- Model must be explainable for business teams.
- Fast predictions for real-time retention offers.
- Integration with CRM systems.

Assumptions

- Past customer behaviour predicts future churn.
- Data collected is accurate and complete.
- Market competition remains stable.
- Customer preferences do not change drastically.

Constraints

- Data privacy and customer consent regulations.
- Class imbalance (fewer churn customers).
- Limited data for new customers.
- Budget and time limitations.

Risks

- Incorrect predictions may lead to unnecessary discounts.
- Data quality issues may reduce model performance.
- Changing competitor strategies.
- Model performance may degrade over time.

Costs and Benefits

Costs:

- Data storage and processing.
- Model development and deployment.
- Skilled manpower.
- Infrastructure maintenance.

Benefits:

- Reduced revenue loss and Increased profitability.
- Improved customer loyalty.
- Better targeted marketing campaigns.

3. Data Science Goals

Data Science Objective

- Build a classification model to predict whether a customer will:
- Churn (Yes)
- Not Churn (No)

Data Science Tasks

- Data cleaning and preprocessing.
- Handling missing values.
- Feature engineering.
- Handling class imbalance (SMOTE / class weights).
- **Model training using:**
    - Logistic Regression
    - Decision Tree
    - Random Forest
    - XGBoost
- Model evaluation and tuning.

Data Science Success Criteria

- Accuracy > 85%
- Recall (Churn class) > 80%
- Precision > 75%
- AUC-ROC score > 0.80
- High F1-score for balanced performance.

4. Project Plan

Stage	Activity	Duration
1	Business Understanding	1 week
2	Data Collection & Understanding	2 weeks
3	Data Cleaning &Preparation	2 weeks
4	Model Building	3 weeks
5	Model Evaluation	1 week
6	Deployment	1 week
7	Monitoring &Maintenance	Continuous

Resources Needed

- Data Scientists
- Telecom domain experts
- IT & DevOps team
- Marketing & CRM team

Tools & Techniques

- Python (Pandas, NumPy, Scikit-learn)
- SQL for data extraction
- Power BI / Tableau for dashboards
- Machine Learning classification algorithms

Final Outcome

- A deployed Customer Churn Prediction System.
- Enables proactive retention strategies.
- Reduces customer loss.
- Improves revenue stability.
- Aligns business goals with data science objectives.