PROJECT SYNOPSIS-CUSTOMER AQUISTION-CLICK PREDICT ENHANCING ONLINE ADVERTISING

DEVELOPED BY-TANAYA SHETE

1.TITLE

CUSTOMER AQUISTION-CLICK PREDICT ENHANCING ONLINE ADVERTISING

2.INTRODUCTION

The project aims to enhance online advertising by providing insights that help businesses acquire customers more efficiently and effectively. By addressing the challenges outlined in the problem statement and achieving the objectives, the project will contribute to improved customer acquisition, reduced costs, and increased revenue.

3.PROBLEM STATEMENT

Businesses often face challenges in effectively acquiring customers due to limited visibility into the performance of acquisition channels, high customer acquisition costs (CAC), or low conversion rates. Without clear insights, marketing efforts may not reach the right audience, resulting in wasted resources and missed growth opportunities.

4.OBJECTIVE:

1.Identify the most effective acquisition channels.

2.Determine factors driving customer conversion.

3.Optimize customer acquisition costs while maximizing customer lifetime value (CLV).

4.Provide actionable insights to improve targeting and marketing strategies.

5.SCOPE OF THE PROJECT

The project, "Customer Acquisition-Click Prediction for Enhancing Online Advertising," aims to predict the likelihood of users clicking on online advertisements. This involves analyzing historical data using SQL for preprocessing and querying, and Jupyter Notebook for exploratory data analysis (EDA), predictive modeling, and data visualization.

Key Aspects:

1. Data Extraction and Preparation:

   o Use SQL to query and clean the dataset containing user interactions with online advertisements.

   o Handle missing data, duplicate records, and outliers.

2. Exploratory Data Analysis (EDA):

   o Utilize Jupyter Notebook for statistical summaries and data visualizations to understand patterns in user behavior.

- Explore correlations between features such as demographics, advertisement types, and click behavior.

3. Predictive Modeling:

   - Train machine learning models in Python (e.g., logistic regression, decision trees, or random forests) to predict click-through rates (CTR).

   - Perform hyperparameter tuning for model optimization.

4. Outcome Visualization:

   - Visualize important insights and model outcomes using libraries like Matplotlib, Seaborn, or Plotly.

5. Recommendations:

   - Provide actionable insights to optimize ad targeting and campaign strategies.

6.METHODOLOGY

1. Data Collection & Preprocessing:

   - Query the advertisement interaction data using SQL to retrieve features such as user demographics, advertisement ID, timestamp, and click status (binary: clicked/not clicked).

   - Clean and format the data, handling null values and ensuring feature consistency.

2. Exploratory Data Analysis:

   - Analyze distributions of variables (e.g., user age, gender, and location).

   - Examine relationships between features and the target variable (click status).

   - Identify patterns and trends in click behavior.

3. Feature Engineering:

   - Create derived features, such as time of day, day of the week, and ad relevance score.

   - Encode categorical variables using techniques like one-hot encoding or label encoding.

4. Model Building:

   - Split the dataset into training and testing subsets.

   - Train machine learning models to predict click probability.

   - Evaluate model performance using metrics like accuracy, precision, recall, F1 score, and AUC-ROC.

5. Data Visualization:

- o   Create visualizations to showcase findings:
    - ▪   Heatmaps for feature correlations.
    - ▪   Bar charts for demographic CTR distribution.
    - ▪   ROC curve for model evaluation.
6.   Reporting & Recommendations:
    - o   Summarize insights in a presentation-ready format.
    - o   Provide recommendations for better ad placements and targeting strategies based on the analysis.

7.TOOLS AND TECHNOLOGIES USED

- •   Databases: MYSQL
- •   PROGRAMMING LANGUAGE:Python
- •   Libraries:Pandas,Numpy,Matplotlib,Seaborn
- •   IDE:Jupyter notebook
- •   Data Sources:Kaggle website

8.EXPECTED OUTCOME

1.   Key Insights:
    - o   Identification of user segments most likely to click on ads.
    - o   Factors that drive higher click-through rates, such as ad content, timing, or targeting.
2.   Predictive Model:
    - o   A robust model that can predict the probability of a click with high accuracy.
    - o   Feature importance rankings to inform future ad campaigns.
3.   Visualizations:
    - o   Interactive dashboards for real-time monitoring of ad performance.
    - o   Clear and actionable visuals for stakeholders, including:
        - ▪   Click distribution by demographics (e.g., age, location).
        - ▪   Model performance metrics like confusion matrix and ROC curve.
4.   Business Impact:
    - o   Increased ad campaign ROI through better targeting.
    - o   Enhanced customer acquisition efficiency.

By leveraging SQL and Jupyter Notebook, this project will bridge data-driven insights and actionable strategies, improving overall ad campaign effectiveness.

9.RECOMMENDATIONS

Leverage Data-Driven Insights:

Use predictive analytics to identify the most effective acquisition channels. Focus on channels that yield higher conversion rates and lower Customer Acquisition Costs (CAC).

Personalize Marketing Strategies:

Implement targeted campaigns tailored to customer preferences and behaviors. Utilize customer segmentation to deliver personalized offers and messaging.

Optimize Ad Spend:

Allocate budget dynamically based on real-time performance metrics of different channels. Reduce spend on underperforming campaigns and invest more in high-performing ones.

10.CONCLUSION

Effective customer acquisition in online advertising relies on a strategic, data-driven approach. By identifying the most impactful channels and optimizing campaigns for cost and conversion, businesses can significantly improve performance. Personalization, retargeting, and continuous experimentation are critical in reaching the right audience and maximizing returns. Ultimately, a well-executed online advertising strategy not only lowers CAC but also enhances customer satisfaction and long-term profitability.