Product: Recommendation System by Market Basket Analytics

Roadmap: https://miro.com/app/board/uXjVNbEJREk=/?share_link_id=320853273093

Problem statement: In the modern retail landscape, businesses face the challenge of effectively leveraging market basket analytics to develop advanced recommendation systems that enhance customer satisfaction and drive revenue. Using Market Basket analysis we will create a recommendation system which will promote products to users based on their basket items.The traditional "one-size-fits-all" approach to product recommendations is no longer sufficient to meet the diverse and evolving needs of customers.

To address this issue, we need to develop a recommendation system that utilizes market basket analytics to understand and anticipate customer preferences. The primary problem lies in designing an intelligent, personalized recommendation system that not only suggests products but also offers cross-selling and upselling opportunities, ultimately increasing sales and fostering customer loyalty.

Use Cases

Our Product Use Cases (Solution):

1. Optimizing Product Placement and Promotions:

Market Basket Analysis provides insights into customer purchase patterns, enabling businesses to optimize product placement, design effective promotions, and increase cross-selling and upselling opportunities.

2. Enhancing Customer Experience:

Understanding purchasing behaviors allows businesses to tailor their offerings and customer experiences, ultimately enhancing customer satisfaction and loyalty.

3. Streamlining Inventory Management:

Analyzing market baskets helps businesses streamline inventory management, reduce overstocking or stockouts, and improve overall operational efficiency. Promote products and increase sales.

Backlog:

1. Market Basket Data Collection and Processing (Automated Data Retrieval):

Subtasks:

- Develop a tool to collect market basket data from retail transactions.
- Retrieve data related to items purchased together and their frequencies.
- Assign to: Backend + Data Scientist
- Priority: High!

2. Data Processing and Transformation Pipeline for Market Basket Analysis:

Subtasks:

- Transform raw data into a format suitable for Market Basket Analysis (e.g., transaction-item format).
- Handle missing or inconsistent records.
- Implement data preprocessing techniques (e.g., item grouping, filtering).
- Save processed data to a suitable storage format (e.g., database, warehouse).
- Assign to: Data Scientist
- Priority: Medium!

3. Market Basket Analysis and Association Rule Mining:

Subtasks:

- Implement algorithms for Association Rule Mining (e.g., Apriori, FP-growth).
- Extract frequent itemsets and generate association rules.
- Identify strong associations and patterns within the market basket data.
- Assign to: Data Scientist
- Priority: High!

4. Visualization and Insights:

Subtasks:

- Create a dashboard to display market basket analysis results.
- Visualize association rules, support, confidence, and lift values.
- Provide insights on item co-occurrences and purchasing trends.
- Assign to: Frontend + Data Scientist
- Priority: High!

5.Recommendation Algorithm Selection:

Subtasks:

- Choose a recommendation algorithm suitable for your business case. Common options include collaborative filtering, content-based filtering, or hybrid methods.
- Ensure the selected algorithm can leverage the association rules from market basket analysis.
- Assign to: Backend + Data Scientist
- Priority: High!

6.Model Training:

Subtasks:

- Using machine learning models, train them on historical transaction data to learn user preferences and item associations.
- Tune hyperparameters to optimize model performance.
- Assign to: Data Scientist
- Priority: High!

7.Evaluation:

Subtasks:

- Evaluate the recommendation system using relevant metrics, such as precision, recall, F1 score, or A/B testing to measure its impact on business goals
- Assign to: Data Scientist + FrontEnd
- Priority: Medium!!

8.Personalization:

Subtasks:

- Implement personalization by tailoring recommendations to individual users or user segments.
- Leverage user profiles, purchase history, and preferences to enhance recommendations.
- Assign to: Data Scientist + API developer
- Priority: High!

9.Integration:

Subtasks:

- Integrate the recommendation system into your e-commerce platform or application.
- Ensure smooth data flow between your recommendation engine and the rest of the system.
- Assign to: API developer.
- Priority: High!

Github: https://github.com/ArtashesMezhlumyan/Marketing-analysis

References

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API

https://gist.github.com/asagar60/1516f87e72b7029e253bdfdba2ccfccb

Dataset

https://www.kaggle.com/datasets/hamzajabbarkhan/online-retail-store-data-from-uci-ml-repo/