VELAMMAL INSTITUTE OF TECHNOLOGY

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**NAAN MUDHALVAN PROJECT (IBM)**

**IBM AI 101 ARTIFICIAL INTELLIGENCE-GROUP 1**

**Title: Market Basket Analysis**

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# Problem Statement:

Unveiling Customer Behaviour through Association Analysis: Utilize market basket analysis on the provided dataset to uncover hidden patterns and associations between products, aiming to understand customer purchasing behaviour and identify potential cross-selling opportunities for the retail business

# Challenges:

Large dataset Market Basket Analysis can be computationallydemanding when dealing with large datasets.

Efficient algorithms and scalable techniques are required to handle such data.

Sparse data problem When transactional data is sparse, meaning there are many items but few frequent item sets, Market Basket Analysis becomes more challenging.

Techniques like FP-growth algorithm can be utilized to address this problem. Interpretation of results Understanding and interpreting the generated association rules require domain knowledge and careful analysis.

False positives and irrelevant rules can mislead decision-making if not properly evaluated.

# METHODS FOR MARKET BASKET ANALYSIS:

## Association rule mining

Association rule mining is a popular technique used in Market Basket Analysis. It uncovers relationships and dependencies between items purchased together, enabling businesses to identify rules such as "If A is purchased, then B is likely to be purchased as well."

## Apriori algorithm

The Apriori algorithm is a widely used method for Market Basket Analysis. It scans the transactional data to discover frequent itemsets and generate association rules. It is efficient in handling large datasets and is highly interpretable.

## FP-growth algorithm

The FP-growth algorithm is an alternative approach to Association Rule Mining. It constructs a compact data structure called the FP-tree, which allows for faster pattern mining. It is particularly useful for handling sparse datasets.

## Data Mining:

In this method we were concentrating on the customers and the retail shop owners they were bought the product depend upon the area need then the retail shop owners collect the data from the customers what they have bought daily basis in this daily needs are different but some company in the market selling some good products to the people in essential manner so depend upon this data the company which were selling good product increasing the product depend upon the area of the need this market basket analyzis is about we have done on the data mining.

**GOALS:**

1. Association Rule Discovery: Implement the Apriori algorithm to identify frequent item sets and generate meaningful association rules based on support, confidence, and lift.
2. Insightful Interpretation: Interpret the generated association rules to understand the relationships between products and their significance, translating them into actionable business strategies.
3. Business Recommendations: Provide clear and actionable recommendations to businesses based on the derived insights, empowering them to make informed decisions for marketing campaigns, inventory management, and customer experience enhancement.
4. Enhanced Sales and Customer Satisfaction: Ultimately, the goal isto enhance sales by optimizing product offerings and improving customer satisfaction through personalized recommendations and strategic business decisions.

# Design Thinking:

In this project we have design the application model for this market basket analysis. This application is fully based on user friendly to the customers where they have bought the products on the nearby retail shop

# The Customer Journey:

## Exploration

Customers embark on a journey to explore various products available in the retail store.

## Selection

After exploring, customers carefully select the items they need for their basket.

## Purchase

Customers proceed to the checkout and finalize their purchase.

The Power of Data

### *Insights*

By analyzing customer purchase data, we can gain valuable insights into their shopping habits.

### *Trends*

Identifying trends helps us anticipate customer needs and tailor our offerings accordingly.

### *Personalization*

With data-driven approaches, we can provide personalized recommendations to enhance the customer experience.

# Streamlined Process

## *Research*

Gather data about customer preferences and shopping patterns.

## *Analyze*

Apply advanced algorithms to identify purchasing patterns and trends.

## *Implement*

Develop and integrate the market basket analysis application into retail shops.

# Benefits for Retailers

## *Optimized Inventory*

Market basket analysis allows retailers to optimize their inventory based on customer demand.


## *Increased Sales*

By offering personalized recommendations, retailers can increase sales and customer satisfaction.

## *Effective Marketing*

With insights into customer preferences, retailers can develop targeted marketing strategies.


# Finding Success through Data

## *Customer-Centric Approach*

By understanding customer needs, retailers can create personalized experiences and build brand loyalty.

## *Continuous Improvement*

Regularly analyzing market basket data allows retailers to adapt and improve their offerings over time.

## *Staying Ahead*

Using data-driven insights helps retailers stay ahead of competition and drive innovation in the industry

# CONCLUSION:

Market Basket Analysis using AI is a valuable tool for businesses to gain a deeper understanding of customer behaviour and optimize sales strategies. By leveraging powerful algorithms and techniques, businesses can uncover hidden patterns and associations in customer purchase data, leading to improved decision-making, enhanced customer experience, and increased sales.