Data Analysis and Key Insights Extraction

1. Customer Demographics Insights

- **Tech-Savvy Teens (18-25)**: Likely to purchase **Clothing, Footwear, and Electronics**.

- **Luxury-Seeking Adults (26-35)**: Prefers **Luxury Items, Tech Products, and Fashion**.

- **Family-Oriented Mid-Lifers (36-45)**: Predominantly purchase **Household Goods, Toys, and Groceries**.

- **Comfort-Driven Seniors (56+)**: Often purchase **Books, Comfort Items, and Health Products**.

2. Sales Performance Insights

- **Total Revenue**: **7502 TL** (for Clothing).

- **Average Revenue per Transaction**: **2,527.45 TL** (on average per invoice).

- **Top-performing Categories**: **Clothing and Footwear** have the highest co-occurrence, leading to higher revenue.

3. Mall Performance Insights

- **Top-performing Malls**:

  - **Kanyon Mall**: Leads in **Revenue, Customer Visits, and Product Diversity**.
  - **Forum Istanbul**: Shows good sales trends, with frequent customer traffic.
  - **Metrocity**: Key cross-selling destination for **Clothing and Footwear**.

4. Product Insights

- **High-margin Products**: **Technology and Luxury Goods** show strong upselling opportunities.

- **High-volume Products**: **Clothing, Food & Beverage, and Footwear** have frequent purchases, indicating strong demand.

5. Payment Methods Insights

- **Payment Trends**: **Credit Card** is the most popular payment method, followed by **Debit Card**, with younger demographics leaning toward **Digital Payments**.

6. Seasonal Insights

- **Peak Sales Months**: **November and December** show strong sales, driven by **holiday shopping and special promotions**.

Conclusion

- **Cross-Selling Opportunities**: Focus on categories with high co-occurrence, such as **Clothing & Footwear** and **Clothing & Food & Beverage**.

- **Upselling Strategies**: Promote **Luxury and Tech Products** alongside **Footwear and Clothing** for higher-value transactions.

- **Customer Demographics**: Tailor product recommendations for **Tech-Savvy Teens** and **Luxury-Seeking Adults** to maximize sales.

- **Mall Performance**: Strengthen partnerships with **Kanyon Mall** and **Forum Istanbul** to leverage high foot traffic and product diversity.

- **Seasonal Strategies**: Prepare targeted campaigns for **November and December** to capture peak holiday shopping trends.

These insights will help businesses **target specific customer segments**, **optimize product offerings**, and **increase overall revenue** through focused marketing strategies.

Market Basket Analysis Report: Key Insights

Objective

- Identify categories that are frequently purchased together.

- Determine cross-selling and upselling opportunities.

Key Findings

- **Top Cross-Selling Pairs**:

  - **Clothing & Footwear**: Co-occurrence value **13,848**.
  - **Footwear & Food & Beverage**: Co-occurrence value **6,024**.
  - **Clothing & Food & Beverage**: Co-occurrence value **6,032**.
  - **Books & Toys**: Co-occurrence value **4,084**.

- **Co-occurrence Matrix**:

  - Strong relationships observed between categories like **Clothing & Footwear** (**13,848**) and **Clothing & Food & Beverage** (**6,032**).

Recommendations

- **Cross-Selling Opportunities**:

  - Bundle **Clothing & Footwear**, **Clothing & Food & Beverage**, and **Toys & Books** for promotions.

- **Upselling Opportunities**:

  - Pair lower-value items (e.g., **Cosmetics**) with higher-value items (e.g., **Footwear**) to increase transaction value.

Visual Insights

- **Co-occurrence Matrix Heatmap**: Highlights strong relationships, notably between **Clothing & Footwear**.

- **Top 10 Cross-Selling Chart**: Displays top product pairs with the highest co-occurrence.

Key Assumptions

- Each transaction row represents a single purchase.

- The matrix reflects purchase patterns, not customer intent.

- External factors like seasonality or promotions are not considered.

Conclusion

- Focus on **Clothing & Footwear** and **Toys & Books** for cross-selling.

- Leverage **Cosmetics** as an upsell with **Footwear**.

- Use these patterns for **targeted marketing** and **product bundling**.

Predictive Customer Behavior Analysis and Category Insights

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1. Overall Category Distribution

- **Categories Considered**: Focused on the most frequently purchased categories.

- **Distribution**:

    - **Clothing**: 34.6%
    - **Cosmetics**: 15.1%
    - **Food & Beverages**: 15.0%
    - **Toys**: 10.2%
    - **Footwear**: 10.1%
    - **Books**: 5.2%
    - **Technology**: 5.0%
    - **Souvenirs**: 4.8%

- **Interpretation**:

    - **Clothing** is the dominant category, contributing the largest share (**34.6%**).
    - **Cosmetics** and **Food & Beverages** have a significant share, closely following at **15.1%** and **15.0%**, respectively.
    - **Footwear, Toys, and Technology** contribute significantly to the diversity of customer purchases.
    - **Books and Souvenirs** are smaller, niche categories with lower overall sales.

2. Category Preference by Top Customers

- **Customer Selection**: Based on the top 10 customers, considering quantity purchased.

- **Top Categories** (from highest to lowest preference):

1. **Books**
2. **Clothing**
3. **Cosmetics**
4. **Food & Beverages**
5. **Footwear**
6. **Souvenirs**
7. **Technology**
8. **Toys**

- **Interpretation**:
  - **Books** and **Clothing** are top preferences, showing significant interest among customers.
  - **Cosmetics** and **Food & Beverages** also have considerable preference.
  - **Footwear** and **Souvenirs** have noticeable demand.
  - **Technology** and **Toys** are purchased less frequently, but they still have loyal customer bases.

3. Most Frequent Categories Purchased by Top 10 Customers

- **Categories Focused**: Top categories based on frequency of purchases:

1. **Food & Beverages**
2. **Clothing**
3. **Technology**
4. **Toys**

- **Interpretation**:
  - **Food & Beverages** stands out as the most purchased category among the top 10 customers.
  - **Clothing** is the second most popular category, demonstrating consistent customer interest.
  - **Technology** and **Toys** are less frequently purchased but still contribute to overall sales.

Conclusion

- **Clothing** is the dominant category, with strong sales across a diverse customer base.

- **Food & Beverages** are highly popular, especially among top customers, with consistent demand.

- **Books, Cosmetics, and Footwear** show notable customer interest but to a lesser extent.

- **Technology and Toys** serve as niche markets, with smaller but loyal customer groups.

These insights help prioritize product promotions and sales strategies, focusing on high-interest categories like **Clothing, Food & Beverages, and Books**, while recognizing the importance of niche categories like **Technology and Toys** for targeted campaigns.

Marketing Strategies for Low-Performing Malls

Key Findings

1. Low-Performing Malls by Total Revenue

- **Top 5 Low-Performing Malls (sorted by total revenue):**

  1. **Emaar Square Mall**: $4,706,729.32
  2. **Forum Istanbul**: $4,870,863.60
  3. **Cevahir AVM**: $4,879,357.97
  4. **Viaport Outlet**: $4,888,804.80
  5. **Zorlu Center**: $5,120,464.65

2. Sales by Product Category

- **Clothing & Footwear**: Major contributors across all malls.

  - **Forum Istanbul**: Clothing is a top performer ($2.38M).
  - **Cevahir AVM**: Footwear is a top performer ($1.3M).

- **Technology & Souvenirs**: Show growth in specific malls.

  - **Viaport Outlet** and **Zorlu Center**: Increasing sales in these categories.

3. Payment Method Sales

- **Cash**: Dominates in **Viaport Outlet** and **Cevahir AVM**.

- **Credit Cards**: Preferred in **Zorlu Center**.

- **Debit Cards**: Popular in **Forum Istanbul**.

Marketing Strategy Recommendations

1. Focus on Key Product Categories

- **Clothing & Footwear**:

  - Promote via discounts or bundles to increase sales, particularly in **Forum Istanbul** and **Cevahir AVM**.

- **Technology & Souvenirs**:

  - Target with limited-time offers or exclusive product launches at **Viaport Outlet** and **Zorlu Center**.

2. Tailored Payment Method Promotions

- **Cash Discounts**:

  - Offer cash-back promotions for cash users at **Viaport Outlet** and **Cevahir AVM**.

- **Credit Card Rewards**:

  - Run exclusive offers for credit card users at **Zorlu Center**.

- **Debit Card Loyalty**:

  - Implement loyalty programs for debit card users at **Forum Istanbul**.

3. Customer Experience & Engagement

- **Events & Flash Sales**:

  - Host events and flash sales to increase foot traffic and improve customer engagement.

- **Personalized Offers**:

  - Design personalized offers based on customer behavior to increase retention and sales.

Conclusion

- This analysis highlights the need for **targeted strategies** in low-performing malls to boost their performance.

- By focusing on **key product categories**, offering **tailored promotions** based on payment methods, and enhancing **customer experience**, malls can increase foot traffic and drive sales growth.

Final Conclusion and Actionable Insights

Reality Check

- **Some malls, like Emaar Square and Forum Istanbul, are underperforming in revenue.**

- **Dominant categories like Clothing and Footwear should be further leveraged, while others, like Technology and Toys, need attention to boost sales.**

Pros

1. **Top Categories:** Clothing and Footwear are strong; these should be capitalized on.

2. **Payment Preferences:** Tailor promotions based on customer payment preferences.

3. **Seasonal Sales:** Leverage December/November peaks to maximize revenue.

Cons

1. **Underperforming Malls:** Low revenue malls need targeted interventions to increase foot traffic and sales.

2. **Category Gaps:** Technology and Toys need focused marketing to increase customer interest.

How to Overcome and Increase

1. **For Malls:** Host events, offer tailored promotions, and attract visitors through influencer partnerships.

2. **For Categories:** Bundle low-performing categories with popular ones, create flash sales, and exclusive offers to spark interest.

3. **Personalization:** Use data to create personalized shopping experiences that drive repeat sales.

Moving Forward

- **The opportunity is clear—address the gaps and capitalize on strengths.** With the right strategies, underperforming areas can be transformed, driving growth and boosting profitability.

- **Let's turn data into action.**