BUAN 6390.001 ANALYTICS PRACTICUM

Week 2 Deliverable

Market Basket Recommender

Group 11

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1. Introduction

This report presents an analysis of an Online Retail dataset using a Market Basket Recommender System implemented in Python. The analysis includes insights into customer behavior, popular items, purchase timings, and average order values during specific months.

2. Market Basket Recommender System

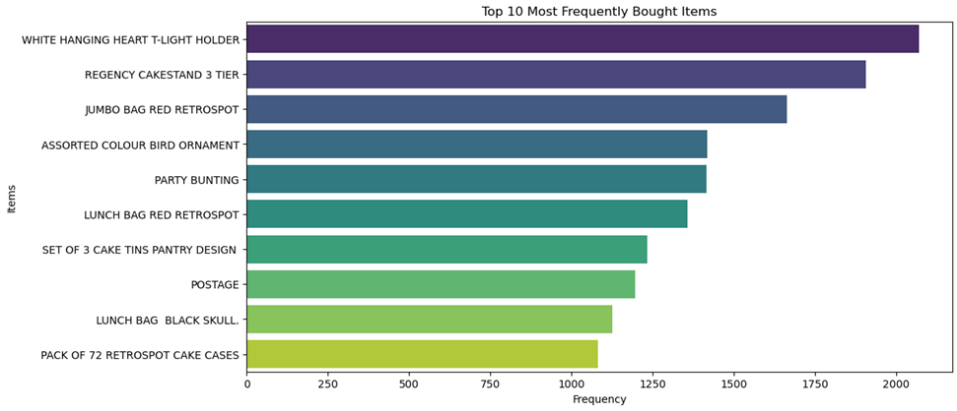
Recommendation Function

The main interface function for the Market Basket Recommender System is as follows:

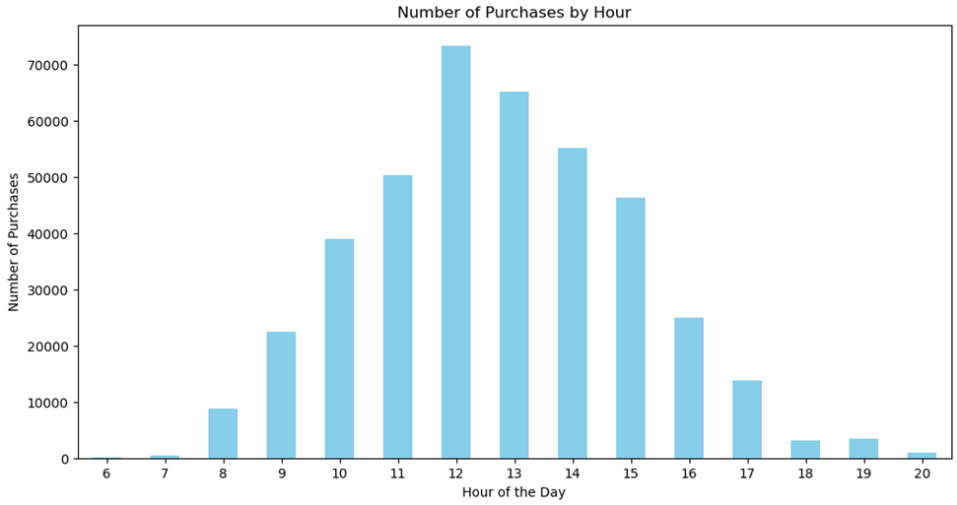
```
def recommend_items(cur_item_of_interest, customer_id, country, date):
# Convert date string to datetime, and filter data
    date = pd.to_datetime(date).date()
    filtered_data = data[
        (data['CustomerID'] == customer_id) &
        (data['Country'] == country) &
        (data['InvoiceDate'].dt.date == date)
    ]
# Adjust recency to be dynamic relative to the date provided
    recency_threshold = filtered_data['InvoiceDate'].max() - pd.Timedelta(days=30)
    recent_data = filtered_data[filtered_data['InvoiceDate'] >= recency_threshold]
# Prepare the data for association rules mining
    basket = (recent_data
              .groupby(['InvoiceNo', 'Description'])['Quantity']
              .sum().unstack().fillna(0))
    basket_sets = basket.applymap(lambda x: 1 if x > 0 else 0)
# Generate frequent item sets and rules
    frequent_itemsets = apriori(basket_sets, min_support=0.05, use_colnames=True)
    rules = association_rules(frequent_itemsets, metric="lift", min_threshold=1)
# Enhance the recommendations by allowing broader matching
rules['antecedents'] = rules['antecedents'].apply(lambda x: set(x))
```

```
cur_item_set = set(cur_item_of_interest) if isinstance(cur_item_of_interest, list)
else {cur_item_of_interest}

recommendations = rules[rules['antecedents'].apply(lambda x: len(cur_item_set & x) >
0)]['consequents']

# Return the recommended items sorted by confidence and lift

    return recommendations.sort_values(['confidence', 'lift'], ascending=[False,
False])
```

- What items do people buy more often?



- What time of day do people buy more often?



A. People buy most often during 11am to 2pm. Peak hour is 12pm.

- What month of the year do people buy more often?

A. People buy most often in the month of November

- What is the average value per order during November and January?

  Average Order Value during November and January: 18.37