InternnCraft Data Science Task Two Report

Muhammad Ahmad Naveed

Report: Coffee Shop Analysis and Recommendations

Overview

The product performance analysis has clearly distinguished different products into the best and the worst based on their sales, profit margins, and amounts of transactions. This report delves into the profitability of products, offers suggestions for raising profits margins and outlines ways to avoid or minimize losses.

Product Performance Summary

Top Products:

1. Ouro Brasileiro Shot
2. Hazelnut Syrup

Bottom 10 Products:

1. Ginger Scone
2. I Need My Bean! Diner Mug
3. I Need My Bean! Latte Cup
4. Scottish Cream Scone
5. Chocolate Chip Biscotti
6. I Need My Bean! T-shirt
7. Jamacian Coffee River
8. Jamaican Coffee River Lg
9. Espresso Roast
10. Traditional Blend Chai Rg

Top 10 Products with Highest Profit Margins:

1. Ouro Brasileiro Shot
2. Hazelnut Syrup
3. Traditional Blend Chai Rg

4. Jamaican Coffee River Rg
5. Lemon Grass
6. Latte Rg
7. Latte
8. Spicy Eye Opener Chai
9. Jamaican Coffee River Sm
10. Jamacian Coffee River

Recommendations to Increase Profit Margins

1. Focus on High-Margin Products:

   High-gross profit products should be prioritized in marketing and sales efforts. This includes products like the Ouro Brasileiro Shot that have appeal yet charge more than their competitors. By doing this it helps enhance profitability and leads to growth in total revenues.

2. Optimize Pricing Strategies:

   Evaluate pricing strategies for medium gross profit products to improve profitability via price modification. You can either raise prices slightly or use high demand product premium pricing strategy.

3. Explore Product Bundling:

   This includes bundling high-margin goods with other items they work well together to make them seem more valuable thus promoting their sale. Average transaction values are raised resulting to more overall profits.

4. Increase Inventory for High-Margin Products:

   To avoid shortages, ensure there is stock of those goods which can bring in higher benefits due to having better margins on sales prices than costs incurred during acquisition that will meet consumer needs at all times when required by customers hence establishing competitive advantage thereby increasing profitability levels within a given period of time.

5. Negotiate Better Supplier Deals:

   Aim at negotiating better terms from suppliers so as to cut down costs on top-selling products' inputs since this would lower production costs and henceforth increase margins on sales or gains realized from its marketing activities conducted by αn organization over some time frame depending on

current conditions faced by every industry across different economies globally today.

Strategies to Minimize or Eliminate Losses

1. Rectify Pricing Strategy:

   Revise and modify charges for goods that have experienced persistent losses. This should be accompanied by a decrease in prices or discounts aimed at boosting sales volume while converting losses into profits.

2. Bring Down Production Costs:

   Explore avenues of reducing production and procurement costs by negotiating better deals with suppliers or optimizing manufacturing processes.

3. Specialist Marketing:

   Increase marketing efforts on low-performing products to increase sales. This may involve targeted promotions, advertising, or special offers to attract customers.

4. End Production of Unprofitable Products:

   Examine the performance of outwardly unprofitable items and think about ending their existences if they possess high loss percentages and scant demand levels. In doing so, this assists to minimize storage expenses as well as apply attention towards other more lucrative options.

5. Find Out What Customers Think:

   Collect data on feedbacks and evaluations to know what the issues are with loss-making items. Fix any quality or customer satisfaction issues that will help improve its acceptance as well as its functioning characteristics.

Product-Specific Recommendations

1. A croissant made with almonds

   If you want to make more money on this sale, you need to increase transaction amounts or move prices around in a way that raises their quality.

2. Brazilian – organic

   You can make it an income-generating commodity by either optimizing your production processes or varying the price of this product.

3. Chocolate chip biscuit

Lower transaction volume or think about changing the price for better results in terms of returns from selling these biscuits.

4. Hazelnut Biscuits

It is important to work on how operations are run as well as regulating costs so as to expand profits.

Conversion Action Steps

1. Carry Out Market Research:

Understand what customers prefer and change products or packs as per their comments.

2. Implement Targeted Promotions:

Discounts and special offers can be used to increase sales for poorly performing products.

3. Monitor Inventory Levels:

Following inventory closely prevents excessive stock in warehouses and subsequently lowers storage expenses.

4. Bundle Products Together:

The idea behind this is that you can take a group of underperforming items and mix them up with items that are doing well to enhance the sales figures.

Conclusion

There is a significant need for specific strategies to manage both successful and unprofitable products as stated in the analysis. This would involve boosting profitability of top selling products while taking corrective action in respect of those that generate losses. The latter entails continuous monitoring and adjustment of strategies in order to maintain or grow profit margins.

Code

```
import pandas as pd

import matplotlib.pyplot as plt

import seaborn as sns

import statsmodels.api as sm
```

```
from sklearn.linear_model import LinearRegression
from sklearn.model_selection import train_test_split
data = pd.read_excel("Coffee Shop Sales.xlsx")
missingVals = data.isnull().sum()
print(missingVals)
duplicates = data.duplicated().sum()
cleanedData = data.drop_duplicates()
for c in cleanedData.select_dtypes(include=['object']).columns:
 cleanedData[c] = cleanedData[c].astype(str)
for c in cleanedData.select_dtypes(include=['object']).columns:
 cleanedData[c] = cleanedData[c].str.strip()
cleanedData['transaction_time'] = pd.to_datetime(cleanedData['transaction_time'],
format='%H:%M:%S')
cleanedData.to_excel("Cleaned_Coffee_Shop_Sales.xlsx", index=False)
cleanedData['total_sales'] = cleanedData['transaction_qty'] * cleanedData['unit_price']
prodSummary = cleanedData.groupby('product_detail').agg({
 'transaction_qty': 'sum',
 'unit_price': 'mean',
 'total_sales': 'sum'
}).reset_index()
prodSummary['profit'] = prodSummary['total_sales'] -
(prodSummary['transaction_qty'] * prodSummary['unit_price'])
productsMakingProfits = prodSummary[prodSummary['profit'] > 0]
productsCausingLoss = prodSummary[prodSummary['profit'] <= 0]
topProducts = productsMakingProfits.sort_values(by='profit', ascending=False)
top10 = topProducts.sort_values(by='profit', ascending=False)
bottomProducts = productsCausingLoss.sort_values(by='profit', ascending=True)
bottom10 = productsCausingLoss.sort_values(by='profit', ascending=True)
feat = prodSummary[['transaction_qty', 'unit_price', 'total_sales']]
target = prodSummary['profit']
```

```
X_train, X_test, y_train, y_test = train_test_split(feat, target, test_size=0.2,
random_state=42)

model = LinearRegression()

model.fit(X_train, y_train)

profitPrediction = model.predict(X_test)

coef = pd.DataFrame({

 'Feat.': feat.columns,

 'Coef.': model.coef_

})

cleanedData['transaction_date'] = pd.to_datetime(cleanedData['transaction_date'])

dailySales = cleanedData.set_index('transaction_date').resample('D')['total_sales']

dailySales = dailySales.fillna(0)

prodSummary['profit_margin'] = (prodSummary['profit'] /
prodSummary['total_sales'])

topMarginProds = prodSummary.sort_values(by='profit_margin', ascending=False)

trends = cleanedData.groupby(['product_detail', pd.Grouper(key='transaction_date',
freq='M')]).agg({

   'total_sales': 'sum'

}).reset_index()

trends['monthly_growth'] =
trends.groupby('product_detail')['total_sales'].pct_change()

growingProds = trends.groupby('product_detail').agg({

   'monthly_growth': 'mean'

}).reset_index()

growingProds = growingProds[growingProds['monthly_growth'] > 0]

topProducts = productsMakingProfits.sort_values(by='profit', ascending=False)

grossMarginPercentage = prodSummary['profit_margin'].mean()

lossFactors['unit_cost'] = lossFactors['unit_price'] * (1 - grossMarginPercentage)

lossFactors['total_cost'] = lossFactors['transaction_qty'] * lossFactors['unit_cost']

lossFactors['profit'] = lossFactors['total_sales'] - lossFactors['total_cost']
```

```
productsCausingLoss = lossFactors[lossFactors['profit'] < 0]
```