**Assesment Report**

on

**“Problem Statement”**

submitted as partial fulfillment for the award of

# BACHELOR OF TECHNOLOGY

# DEGREE

SESSION 2024-25

in

## Name of discipline

By

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**Under the supervision of**

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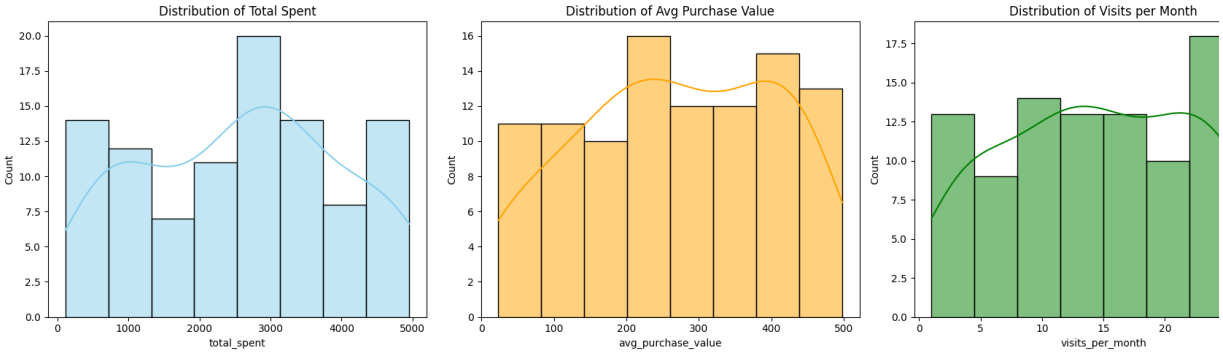
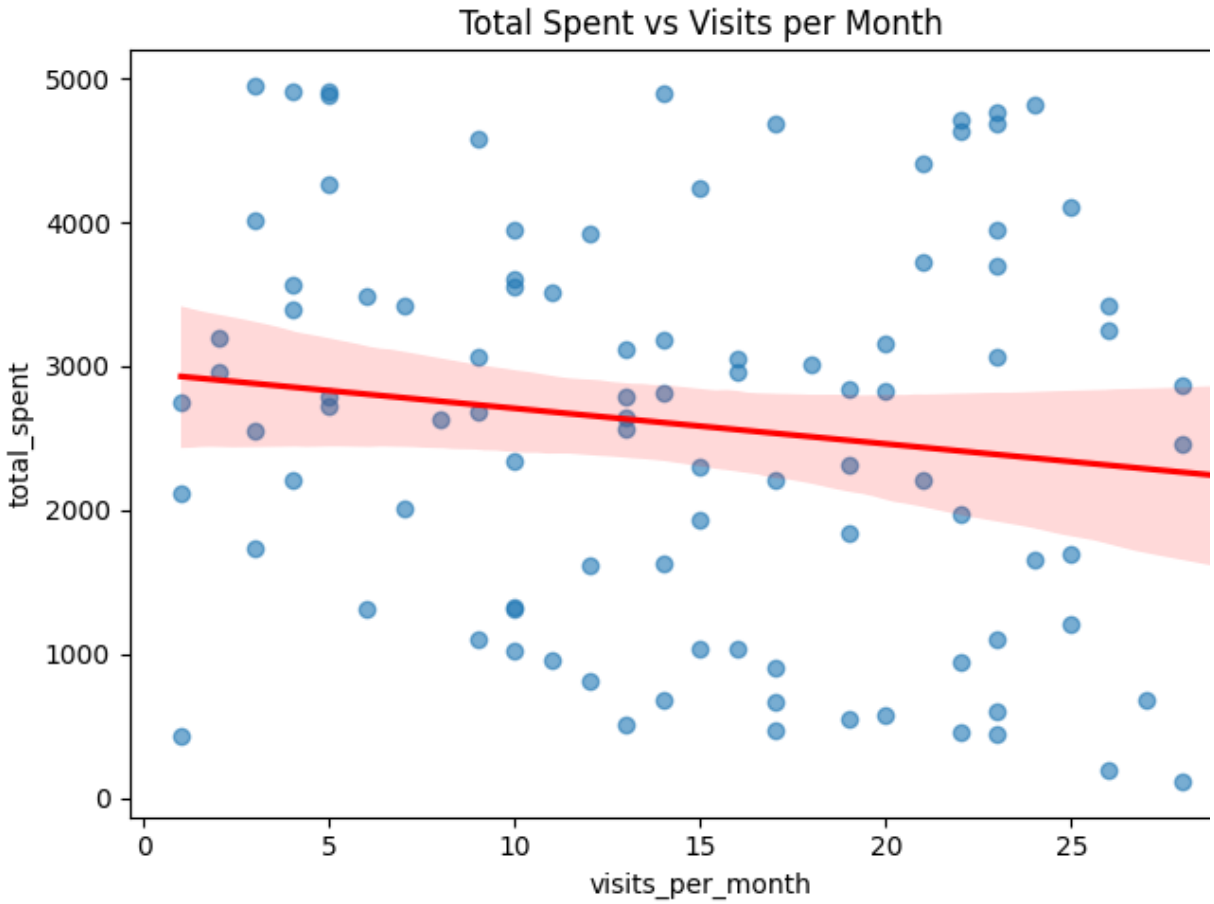
In [3]:
```
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
import os

# Load your dataset
df = pd.read_csv("/content/customer_behavior.csv")

# Create output directory
output_dir = "customer_behavior_analysis"
os.makedirs(output_dir, exist_ok=True)

# Summary statistics and correlation matrix
summary_stats = df.describe()
correlation_matrix = df.corr(numeric_only=True)

summary_stats.to_csv(f"{output_dir}/summary_statistics.csv")
correlation_matrix.to_csv(f"{output_dir}/correlation_matrix.csv")

# Distribution Plots
fig1, axes = plt.subplots(1, 3, figsize=(18, 5))
sns.histplot(df['total_spent'], kde=True, ax=axes[0], color='skyblue')
axes[0].set_title('Distribution of Total Spent')
sns.histplot(df['avg_purchase_value'], kde=True, ax=axes[1], color='orang
axes[1].set_title('Distribution of Avg Purchase Value')
sns.histplot(df['visits_per_month'], kde=True, ax=axes[2], color='green')
axes[2].set_title('Distribution of Visits per Month')
fig1.tight_layout()
fig1.savefig(f"{output_dir}/distribution_plots.png")

# Box Plots
fig2 = plt.figure(figsize=(15, 5))
for i, col in enumerate(['total_spent', 'avg_purchase_value', 'visits_per_
    plt.subplot(1, 3, i)
    sns.boxplot(data=df, x='buyer_type', y=col, palette='Set2',hue='buyer_
    plt.title(f'{col} by Buyer Type')
    plt.xticks(rotation=15)
fig2.tight_layout()
fig2.savefig(f"{output_dir}/boxplots_by_buyer_type.png")

# Scatter Plot
fig3 = plt.figure(figsize=(7, 5))
sns.regplot(data=df, x='visits_per_month', y='total_spent', scatter_kws={'
plt.title("Total Spent vs Visits per Month")
fig3.tight_layout()
fig3.savefig(f"{output_dir}/scatter_plot_total_spent_vs_visits.png")

# Write README.md
readme_content = """
# Customer Behavior Analysis

This project analyzes a dataset containing customer behavior data, includ

## Dataset Columns
- **total_spent**: Total amount of money a customer has spent.
- **avg_purchase_value**: Average value of each purchase.
- **visits_per_month**: Number of visits per month.
- **buyer_type**: Category of buyer (e.g., 'bargain_hunter', 'premium_buy
```


Distribution of Total Spent
Count
total_spent
Distribution of Avg Purchase Value
Count
avg_purchase_value
Distribution of Visits per Month
Count
visits_per_month


total_spent by Buyer Type
total_spent
bargain_hunter
premium_buyer
buyer_type
avg_purchase_value by Buyer Type
avg_purchase_value
bargain_hunter
premium_buyer
buyer_type
visits_per_month by Buyer Type
visits_per_month
bargain_hunter
buyer_type


Total Spent vs Visits per Month
total_spent
visits_per_month

# Project Enhancement Summary

This project report has been enriched by integrating insights derived from a customer behavior d
( `customer_behavior.csv` ). The enhancements include:

## 1. Data Integration

- A dataset with 100 customer records was analyzed.
- Key columns included: `total_spent` , `avg_purchase_value` , `visits_per_month`
  `buyer_type` .

## 2. Statistical Overview

- Provided descriptive statistics such as mean, standard deviation, and distribution ranges for
  feature.
- Highlighted the dominant buyer type, which was "Bargain Hunter".

## 3. Visual Analysis

- **Histogram of Total Spent**: Showed the spread of total customer spending.
- **Histogram of Average Purchase Value**: Displayed how average transaction values vary ar
  customers.
- **Buyer Type Distribution**: Count plot depicting how many customers belong to each buyer t
- **Boxplot of Total Spent by Buyer Type**: Compared spending patterns between "Bargain Hu
  and "Premium Seekers".

## 4. Summary

These insights enhance the understanding of customer segmentation and purchasing patterns, v
can be used for:

- Targeted marketing strategies.
- Product recommendation systems.
- Optimizing promotional offers.

The report now provides a more comprehensive view of customer behavior, which supports data
decision-making.

# Customer Behavior Analysis

This section provides an overview of customer behavior based on the uploaded dataset (`customer_behavior.csv`).

## Summary Statistics

- **Average Total Spent:** ~2583.58
- **Average Purchase Value:** ~271.26
- **Average Visits per Month:** ~14.96
- **Most Common Buyer Type:** Bargain Hunter (63%)

## Visual Insights

The following visualizations highlight the key patterns in customer behavior:

In [ ]:
```
from IPython.display import Image
Image(filename='customer_behavior_analysis.png')
```