**Overview of Bike\_Sales Project**

**Tools Used: Python**

**Project Objectives:**

The Bike\_Sales project aims to analyze sales data to derive valuable business insights. The project involves:

1. **Descriptive Statistics Analysis**
2. **Customer Gender and Profitability Analysis**
3. **Cost and Revenue Analysis**

**Questions Addressed:**

1. **How does profitability differ between customer genders?**
2. **What are the most frequent costs and revenues?**

**Tools Used:**

* **Python:** Programming language for data manipulation and analysis.
* **Pandas:** Library for data analysis and manipulation.
* **NumPy:** Library for numerical operations.
* **PyCharm:** Integrated Development Environment (IDE) for Python development.

**Code Implementation:**

1. **Loading the Data:**

import pandas as pd

# Define the file path

file\_path = 'C:/Users/DELL/Desktop/Statistics using Python\_BikeSales/BikeSalesCleanedData.xlsx'

# Load the Excel file

data = pd.read\_excel(file\_path)

1. **Descriptive Statistics:**

# Display first 5 rows of the dataset

print(data.head())

# Describe the data

print(data.describe())

1. **Customer Gender and Profitability Analysis:**

# Group by Customer\_Gender and calculate total Revenue and Profit

gender\_profitability = data.groupby('Customer\_Gender').agg({

'Revenue': 'sum',

'Profit': 'sum'

})

print(gender\_profitability)

1. **Mode Analysis:**

# Find the mode for Cost and Revenue

mode\_cost = data['Cost'].mode()

mode\_revenue = data['Revenue'].mode()

print(f"Mode Cost: {mode\_cost}")

print(f"Mode Revenue: {mode\_revenue}")

**Results:**

1. **Customer Gender and Profitability:**

| **Customer\_Gender** | **Revenue** | **Profit** |
| --- | --- | --- |
| F | 193,433 | 88,665 |
| M | 125,743 | 57,131 |

* + Female customers have generated more revenue and profit compared to male customers.

1. **Mode Analysis:**
   * **Mode Cost:** 1266
   * **Mode Revenue:** 2320
   * The most common cost is 1266, and the most common revenue is 2320.

**Business Strategy Recommendations:**

1. **Target Female Customers:**
   * Since female customers contribute more to revenue and profit, consider focusing marketing and sales strategies towards this demographic.
2. **Pricing Strategy:**
   * Review and possibly standardize pricing around the most common cost and revenue values to align with common transaction patterns.
3. **Product Analysis:**
   * Analyze which product descriptions are most frequently associated with high revenue and profit, and focus on promoting those products.

**Sum:**

1. Focus marketing efforts on female customers.
2. Consider standardizing pricing around the most common values.
3. Promote products associated with higher revenue and profit.