

---

# CUSTOMER LIFETIME VALUE

---



Carreon, Ma. Addine Anne  
Chamorro, Hans Marvin  
Villapando, Christian James

---

# METHODS

## 01 LOGISTIC + LINEAR REGRESSION METHOD

Logistic regression is used for classification, determining whether a customer is likely to make a future purchase based on features like **recency, frequency, and monetary value**. Linear regression predicts the amount they might spend in their **next transaction**. This method relies on manually crafted features and direct statistical modeling.

## 02 LIFETIMES METHOD

Lifetimes is a specialized library for customer lifetime value (CLV) analysis. The BG/NBD model predicts the probability of customers making future purchases **based on transaction patterns**, while the Gamma-Gamma model **estimates the expected monetary value** of those transactions. This method is probabilistic, leveraging historical transaction data to model customer behavior over time without requiring manual feature engineering.

# PYTHON PACKAGES

01

---

## PYTHON PACKAGES FOR LOGISTIC + LINEAR REGRESSION METHOD

- pandas
- scikit-learn:
  - LogisticRegression
  - LinearRegression
  - train\_test\_split
  - accuracy\_score
  - mean\_squared\_error
  - StandardScaler
  - classification\_report
- matplotlib
- seaborn

02

---

## PYTHON PACKAGES FOR LIFETIMES METHOD

- pandas
- lifetimes:
  - BG/NBD
  - Gamma-Gamma
- matplotlib
- seaborn

**WHICH CUSTOMER WILL  
PURCHASE NEXT AND HOW  
MUCH WILL THEY SPEND?**

# CUSTOMER REPORTS

WHICH CUSTOMER AND HOW MUCH?

**Logistic + Linear**

**LOGISTIC + LINEAR  
PREDICTS THAT  
SAMBE WILL BE THE  
NEXT CUSTOMER TO  
MAKE A PURCHASE  
SPENDING 226.36**

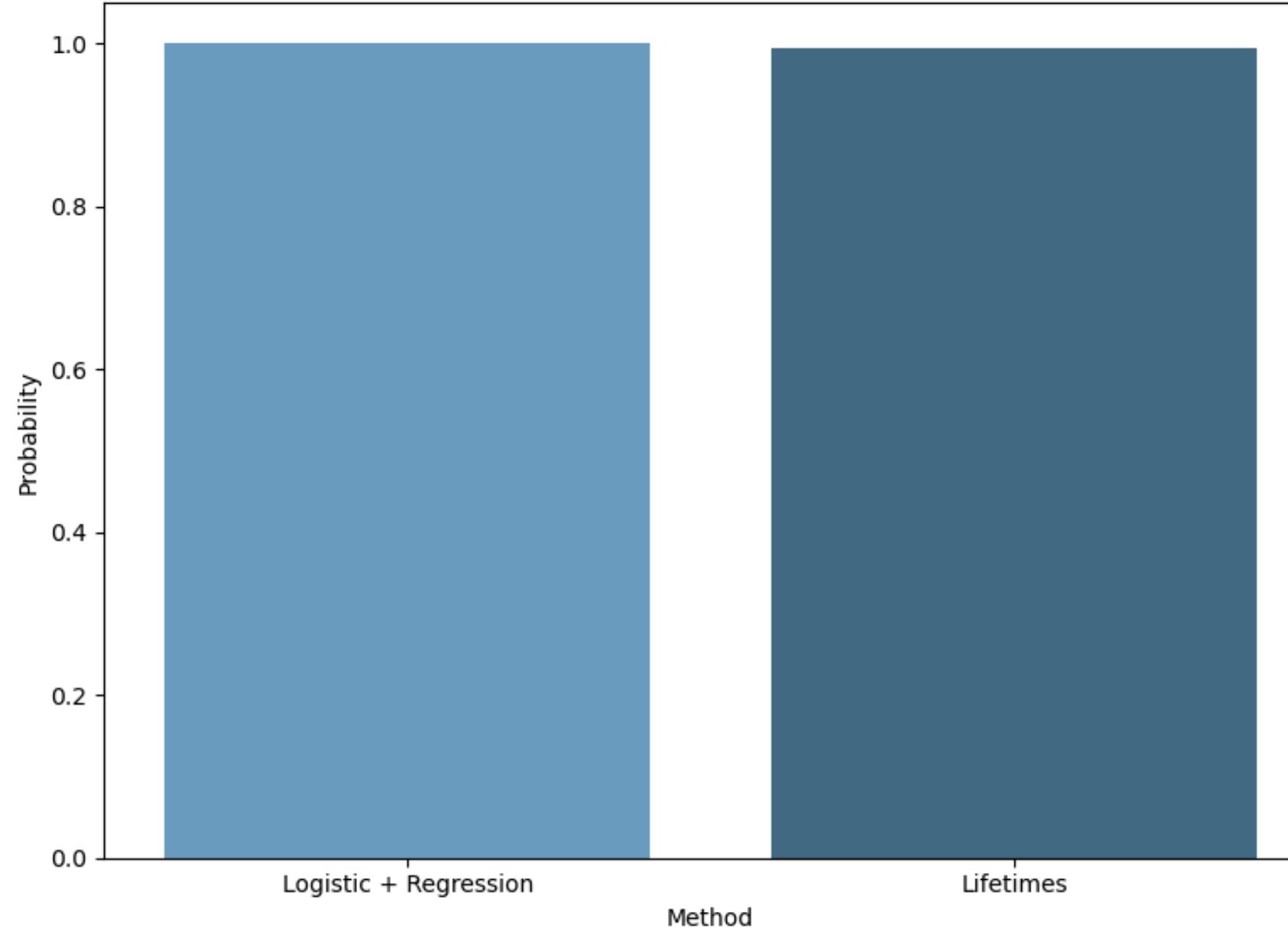
**Lifetimes**

**LIFETIMES PREDICTS  
THAT ANDRE WILL BE  
THE NEXT CUSTOMER  
TO MAKE A  
PURCHASE SPENDING  
1420.08**

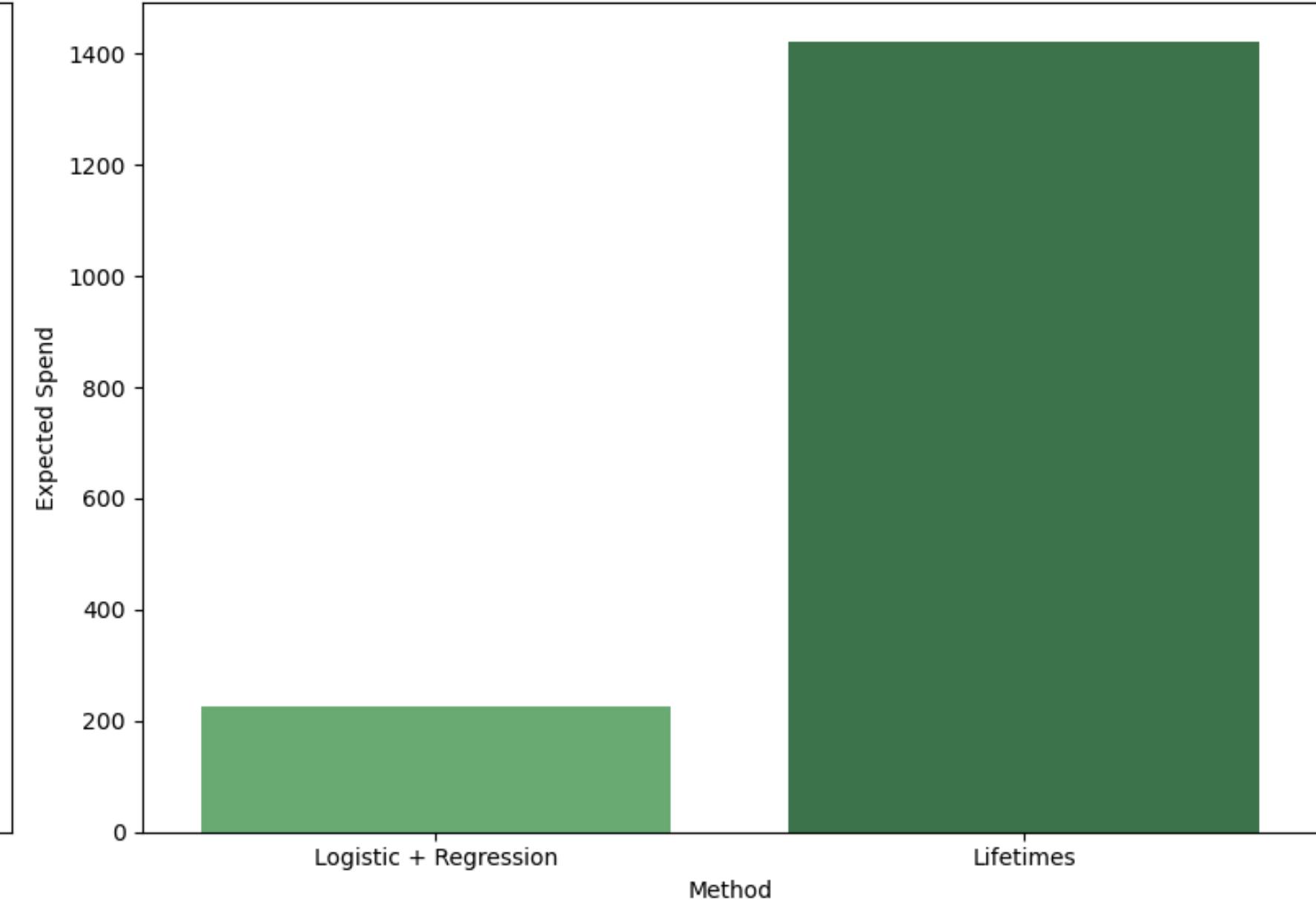
# CUSTOMER REPORTS

WHICH CUSTOMER AND HOW MUCH?

Purchase Probability Comparison



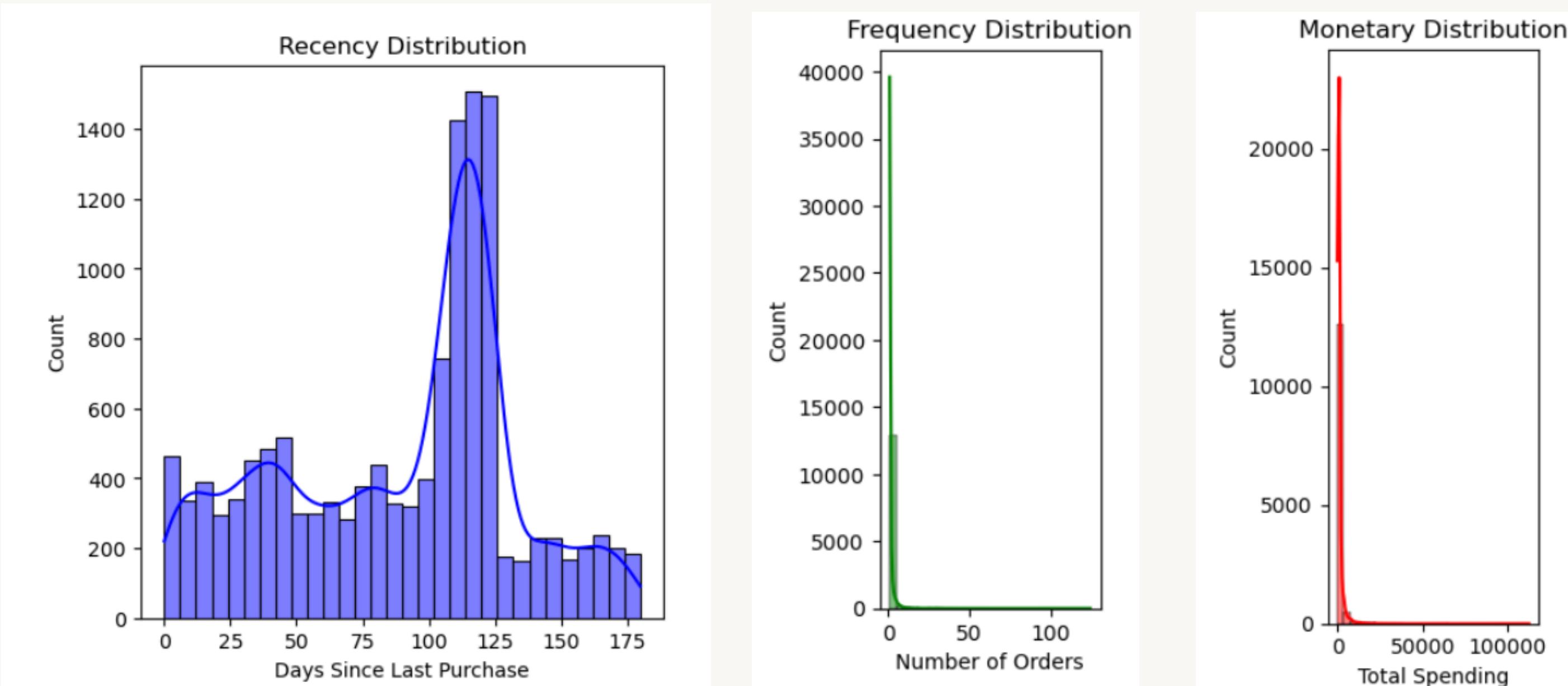
Expected Spend Comparison



# CUSTOMER REPORTS

WHICH CUSTOMER AND HOW MUCH?

Logistic + Linear

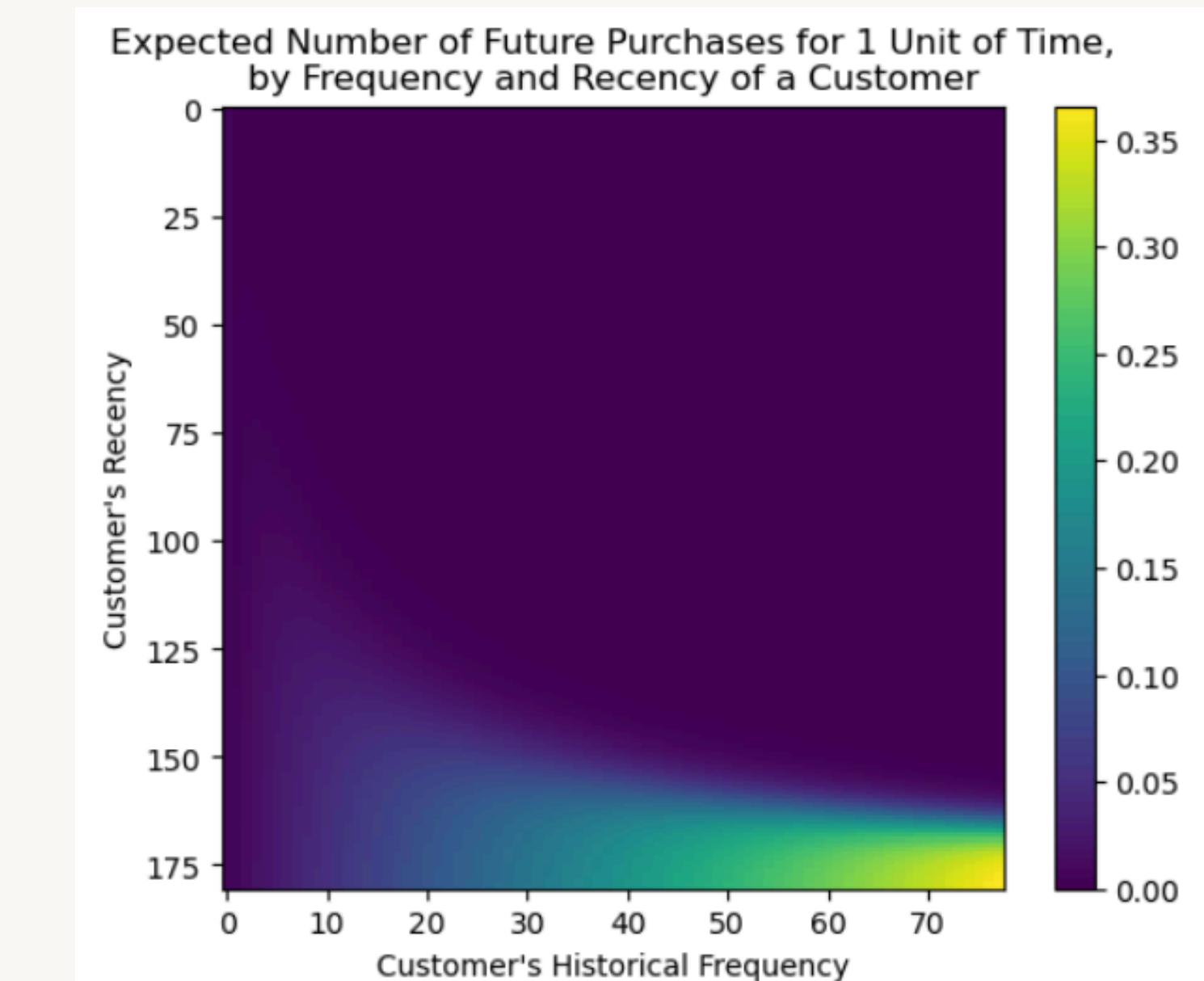
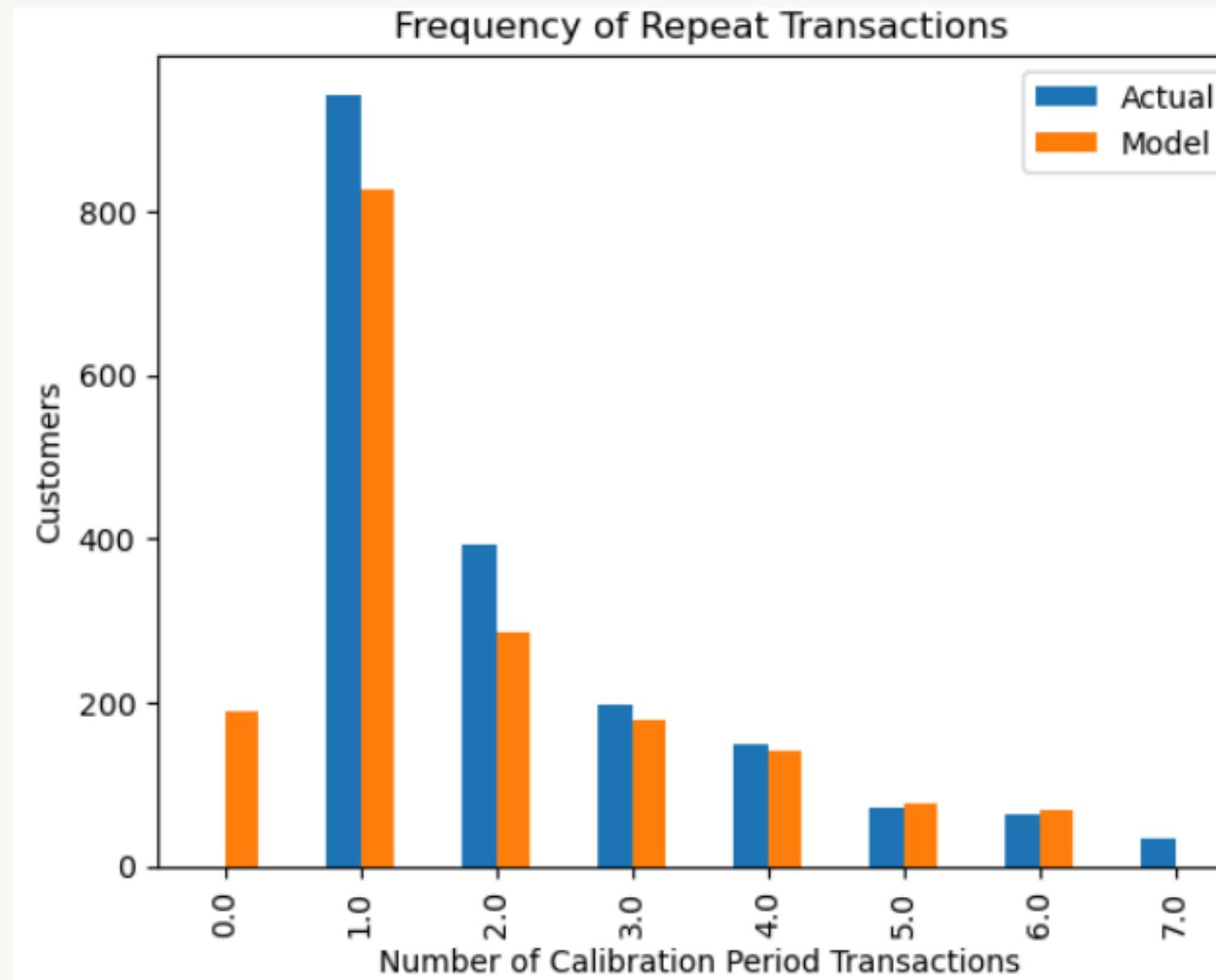


THE RECENCY DISTRIBUTION (LEFT) DISPLAYS HOW MANY CUSTOMERS MADE THEIR LAST PURCHASE WITHIN CERTAIN TIME PERIODS, WITH A NOTABLE SPIKE AROUND 125 DAYS. THE FREQUENCY DISTRIBUTION (MIDDLE) SHOWS THE NUMBER OF ORDERS PER CUSTOMER, WITH MOST CUSTOMERS MAKING VERY FEW ORDERS. THE MONETARY DISTRIBUTION (RIGHT) ILLUSTRATES TOTAL CUSTOMER SPENDING PATTERNS, REVEALING MOST CUSTOMERS SPEND AT THE LOWER END OF THE SCALE.

# CUSTOMER REPORTS

WHICH CUSTOMER AND HOW MUCH?

## Lifetimes



TWO KEY INSIGHTS ABOUT CUSTOMER BEHAVIOR: A COMPARISON OF ACTUAL VERSUS PREDICTED REPEAT PURCHASE PATTERNS, AND A HEATMAP SHOWING EXPECTED FUTURE PURCHASES. THE LEFT GRAPH REVEALS MOST CUSTOMERS MAKE 1-2 REPEAT PURCHASES, WHILE THE RIGHT HEATMAP INDICATES THAT CUSTOMERS WITH FREQUENT, YET NOT RECENT PURCHASES ARE MOST LIKELY TO BUY AGAIN.

# DISCUSSION:

## Predicted Next Customer:

The two methods identify different customers due to their distinct approaches. Logistic + Linear Regression uses **feature-based predictions** from transaction history, while Lifetimes uses **probabilistic modeling** (BG/NBD) to assess customer activity. This leads to varying results for the next likely customer.

## Predicted Spend:

Spending predictions differ significantly. Logistic + Linear Regression gives a moderate estimate of **226.36** based on direct regression, while Lifetimes predicts higher amounts of **1420.08** using the Gamma-Gamma model, which considers historical transaction averages and long-term patterns.

## Model Approach:

Logistic + Linear Regression is **simpler**, relying on feature-based predictions. Lifetimes, designed for customer lifetime value analysis, uses probabilistic models, **offering deeper insights** but requiring more assumptions and parameter fitting.

---

# THANKS FOR LISTENING

---

