

Adidas Synthetic Sales Analysis

Uncovering insights into customer shopping behavior, spending patterns, and product preferences to guide strategic business decisions



Dataset Overview

Scope

Synthetic sales data from January 2023 – September 2025

- 1,200 transactions
- 15 key features
- Multiple regions & store types

Key Metrics

Comprehensive transaction data including:

- Product categories & SKUs
- Revenue & profit margins
- Customer demographics
- Payment methods



Project Objectives

01

Data Preparation

Clean, preprocess, and normalize sales data

02

Predictive Modeling

Ridge Regression, Random Forest, Prophet forecasting

03

SQL Analysis

Extract insights through database queries

04

BI Dashboards

Create interactive Power BI visualizations

05

Strategic Insights

Generate actionable business recommendations

Ridge Regression: Profit Prediction

92.2%

R^2 Score

Model accuracy for
profit prediction

281.5

Mean Squared
Error

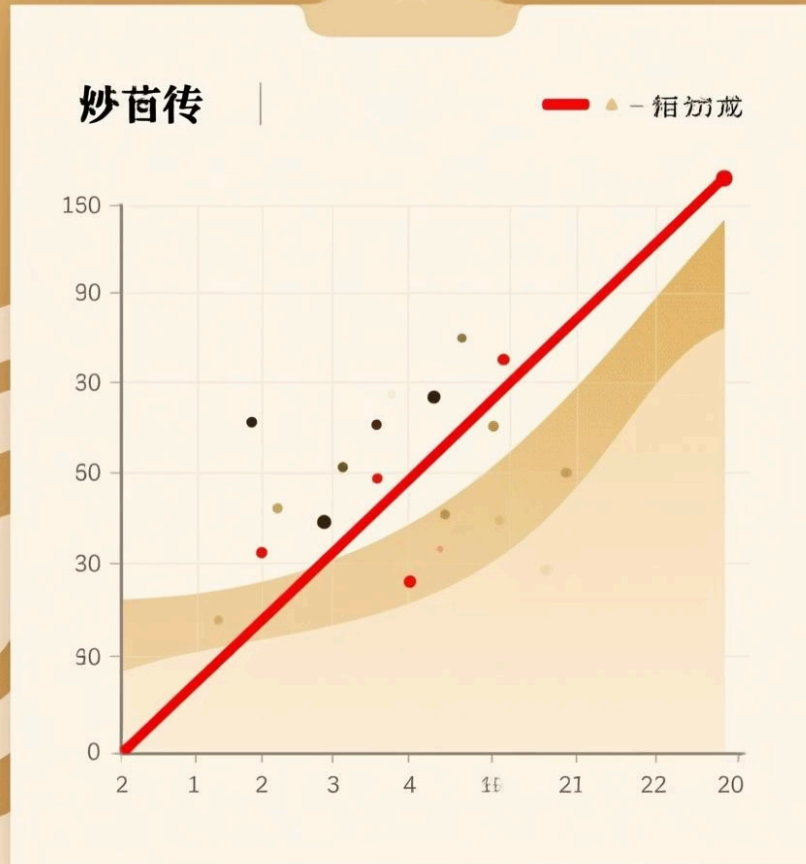
Prediction error metric

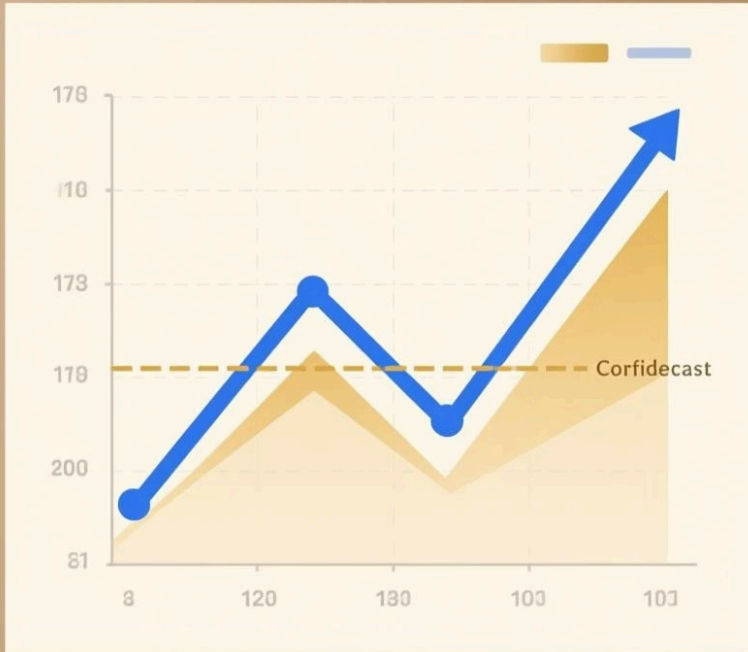
1.0

Best Alpha

Optimal regularization
strength

Ridge regression successfully predicts profit with high accuracy, demonstrating strong model performance and reliable forecasting capability





Prophet: 12-Month Profit Forecast

Forecast Insights

- Profit range: 2,000–3,000 units
- Seasonal volatility observed
- Peaks in mid-year periods
- Confidence intervals widen over time

Key Predictions

Oct 2025: 2,736

Dec 2025: 3,136

Sep 2026: 2,626

Random Forest: Units Sold Prediction



81.7% Accuracy

Strong predictive performance for units sold classification



75.2% OOB Score

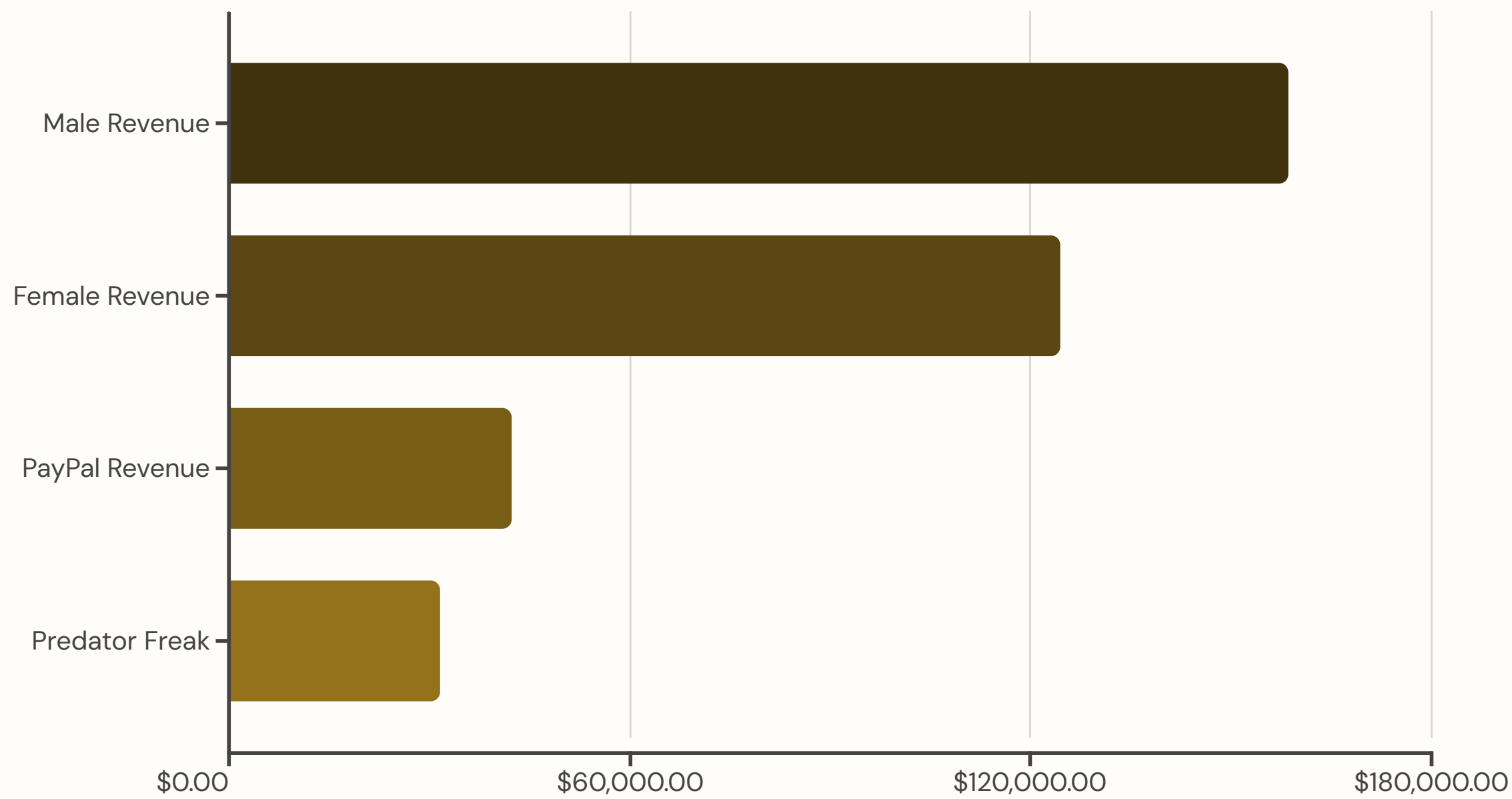
Out-of-bag validation confirms model reliability

Top Features: Unit Price (0.28), Revenue (0.26), and Profit (0.18) drive predictions most strongly

Feature Importance Predictors



SQL Analysis: Revenue Insights



- Gender Distribution
Male customers generate 55% of total revenue
- Payment Preference
PayPal leads payment methods in revenue generation
- Top Product
Predator Freak drives highest single-product revenue



Power BI Dashboard: Key Findings

1K Orders

Total transactions processed

287K Revenue

Total sales generated

5.84 Avg Discount

Promotional pricing strategy

Category & Channel Performance

Revenue by Category

- **Footwear:** 180K (62%)
- **Apparel:** 80K (28%)
- **Accessories:** 30K (10%)

Orders by Store Type

- **Retail:** Highest volume
- **Online:** Strong growth
- **Wholesale:** Steady contributor

📌 **Key Insight:** Footwear dominates revenue generation—prioritize inventory and promotions in this category



Strategic Recommendations



Loyalty Programs

Reward repeat buyers to increase retention



Footwear Focus

Highlight top-rated products in campaigns



Discount Strategy

Balance sales boost with margin control



Targeted Marketing

Focus on high-revenue demographics

