Customer Lifetime Value Prediction

Using Machine Learning to Predict Customer Value

The Starks

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Context

What is Customer Lifetime Value (CLV)?

The total revenue a business expects from a customer over their entire relationship.

Why Does It Matter?

- Acquiring new customers costs **5-25x more** than retaining existing ones
- CLV-driven strategies improve acquisition efficiency by **5-8%**
- Enables smarter allocation of marketing budgets

Business Applications

- Identify high-value customers for VIP treatment
- Target at-risk customers with retention campaigns
- Segment customers for personalized marketing

Hypothesis

> *"Historical purchase patterns (recency, frequency, and monetary value) can accurately predict a customer's future lifetime value."*

What We're Testing

- Can RFM features predict future customer spending?
- Which ML model performs best? (Linear vs. Random Forest vs. XGBoost)
- Can we create actionable customer segments from predicted CLV?

Success Metrics

RMSE	R^2	Lift
Prediction Error	Model Fit	Top 20% Identification

Data

Online Retail II Dataset — UCI Machine Learning Repository

541K	2 Years	UK
Transactions	Dec 2009 - Dec 2011	Online Giftware Retailer

RFM Features

- **Recency** — days since last purchase
- **Frequency** — number of orders
- **Monetary** — total spend

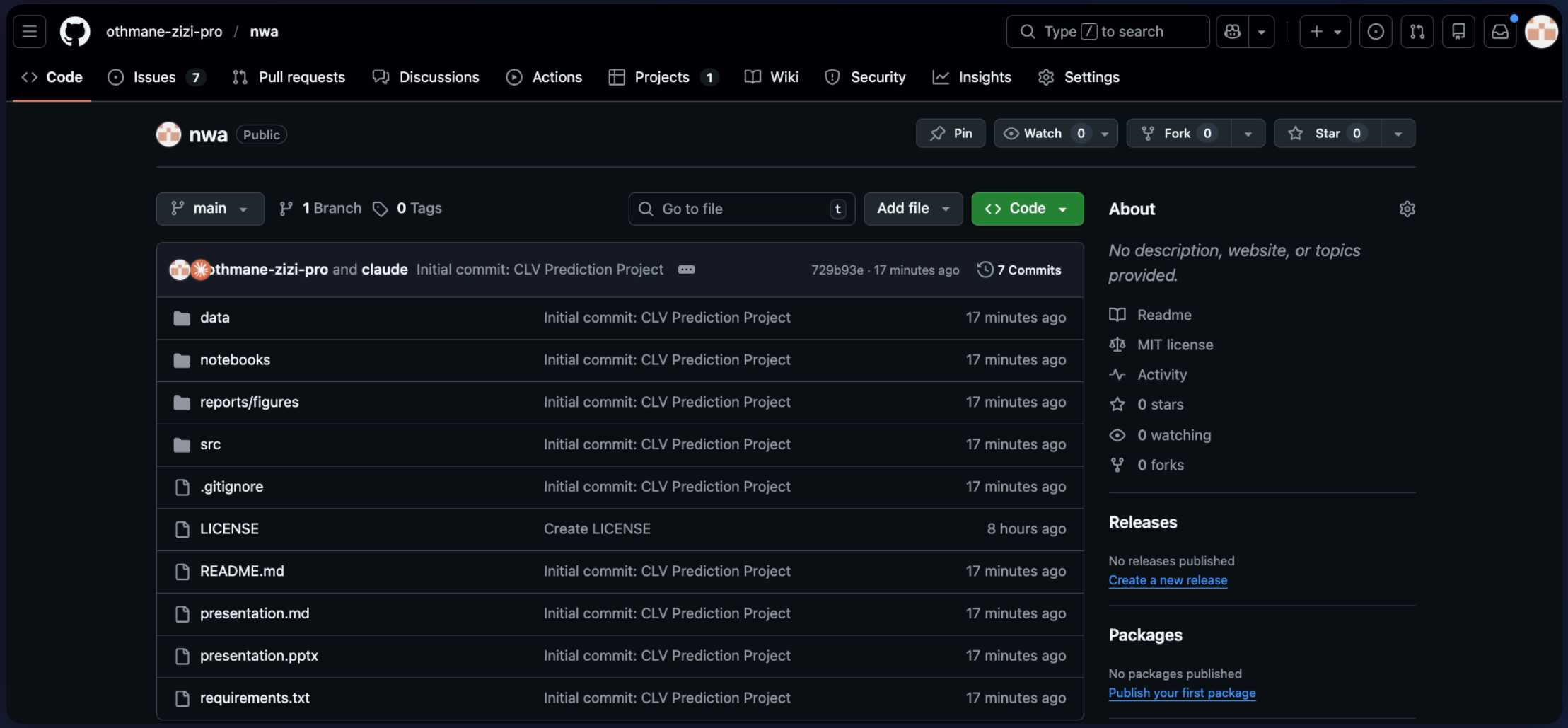
Behavioral Features

- **Tenure** — customer age
- **Avg time** between purchases
- **Unique products** bought

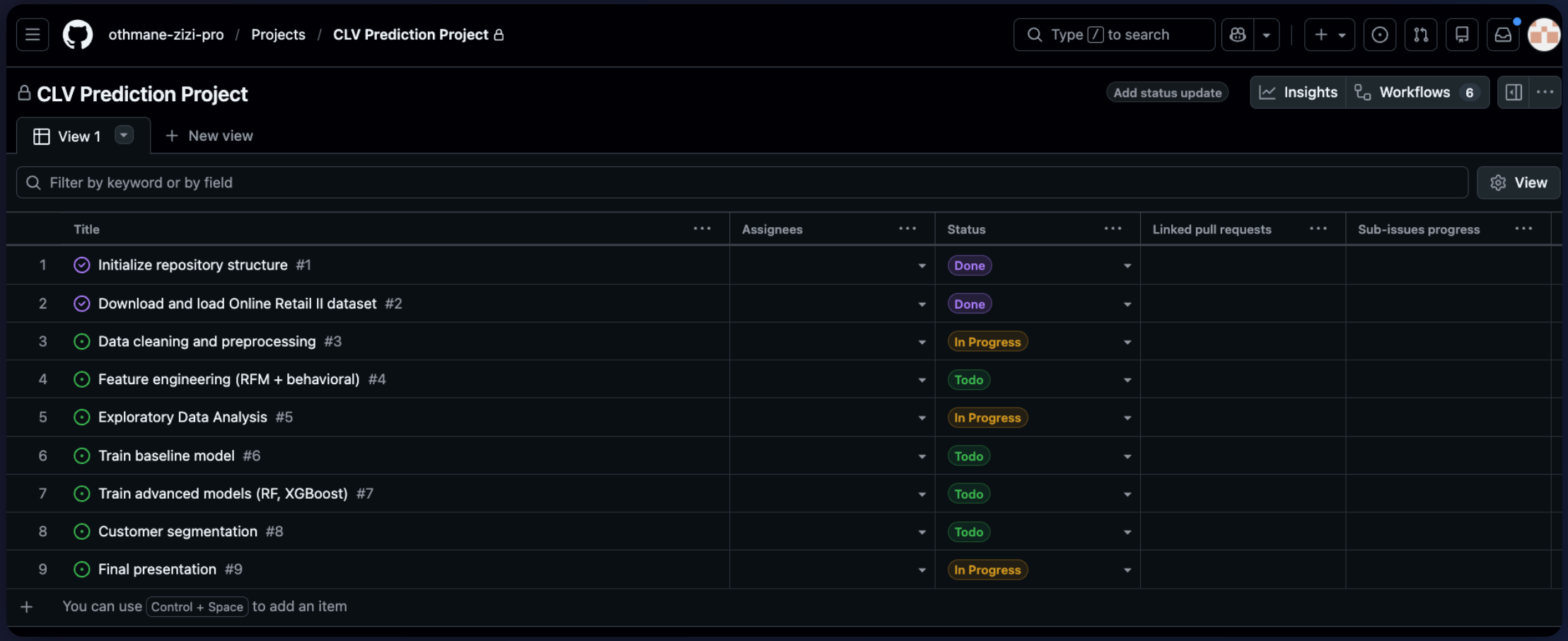
Target Variable

CLV = Total customer spend in the next 6 months

GitHub Repository



GitHub Project Board



Summary

Problem: Identify high-value customers

Data: 541K retail transactions over 2 years

Approach: RFM features → ML models → Segmentation

Goal: Enable targeted, data-driven marketing

Questions?