Revenue Optimization Strategy: Venue Gamma

Profit Formula

P = (Ticket Revenue + Merch Revenue) - (Fixed Costs + Variable Costs)

Components:

- Ticket Revenue: Price x Attendance
- Merch Revenue: Attendance * Spend Per Head (Driven by Crowd Energy)
- Costs: $5,000 + ($8 x Attendance)

Assumptions

Demand Elasticity:

- Finding: The demand curve for Venue Gamma is highly inelastic. Unlike typical venues where attendance drops as prices rise, the "Snob Pit" audience shows very little sensitivity to price increases.
- Implication: High prices do not deter attendance significantly; in fact, the data suggests the audience is willing to pay premium rates for access.

The Economy

- Finding: Crowd Energy is critical for Merchandise sales.
- Model Output: The Machine Learning model predicts that even at higher price points, the Crowd Energy at Venue Gamma remains stable (likely due to the "exclusivity" factor), ensuring that Merch spending per head remains high.

Methodology: Simulation Analysis

The Process: We tested 381 distinct price points ranging from $20 to $400. For each price point, we executed the following logic flow:

- Demand Prediction (Linear Regression): We calculated the expected attendance using a linear demand curve derived from historical data. Attendance was capped at 800.
- Energy Prediction (Machine Learning): We fed the specific Ticket_Price and predicted Crowd_Size into our production Random Forest model to predict the expected Crowd Energy.
- Merch Prediction (Linear Regression): We used the predicted Crowd Energy to estimate the Spend_Per_Head for merchandise.
- Profit Calculation: We aggregated all revenues and subtracted costs to find the net profit for that specific price.

Recommendation

Optimal Ticket Price: $291

Justification: The simulation curve shows that the profit continues to climb well past the standard industry rates.

- At $60 (Standard): The venue sells out, but we leave massive profit margins on the table.
- At $291 (Optimal):
    - Ticket Margin: We earn nearly 5x the revenue per ticket compared to standard pricing.
    - Attendance: While attendance may dip slightly below capacity, the revenue gain per person overwhelmingly offsets the loss of a few attendees.

- Total Profit: This price point generates the absolute maximum profit available given the current market demand.

Final Verdict : The data proves that Venue Gamma's crowd is willing to pay it. Charging $291 maximizes the band's return on investment and perfectly matches the exclusive profile of the venue.