Leveraging Prime Day Data for Targeted Sales

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| **Abhinav Adhikari, Olivier Mizero, Nick Oelschlaeger**  University of Nebraska at Omaha  ECON 8310 – Business Forecasting  **Introduction**  The project aims to develop a three month forecast for Amazon purchase data for INSERT DEMOGRAPHIC/CATEGORY HERE at a daily/weekly level. The data comes from Harvard’s open e-commerce project and contains nearly two million purchase records from 5027 customers. The project followed a five step-development. First, the datasets produced by Harvard were merged and explored for observable trends. Then, additional features were derived from the data. Thirdly, the comprehensive final dataset was investigated using clustering methods to find features and patterns of interest to use in predictive modeling. Fourth, several forecasting methods were developed. Fifth and finally, predictive results were validated (CAN YOU VALIDATE FORECASTS?) and interpreted. The discussion of the model results includes a strategy for increasing targeted sales based on prime day purchase behavior.  **Data Pre-Processing and Exploration**  The open e-commerce data used in this project contains nearly two million records and 32 features. The data came in two files. A purchase file contained each individual purchase record from the start of 2018 to the middle of August 2024. The second file held survey records for each customer which asked for demographic information and some e-commerce opinion related questions. Purchase quantity and summed purchase prices will be used as key indicators. Dimensional reduction will be used to determine the independent features of interest to these forecasts.  Initial data exploration guided the team’s decision on which demographic to model.  **Feature Engineering**  Prime Day Purchase Categorizing  Mapping product titles to Amazon departments using a text categorizer.  **Clustering of Features**  Using the demographic selected in the data exploration step, we used dimension reduction clustering to select features for use in our predictive modeling step.  **Predictive Modeling**  With the determined criteria, both quantity and overall revenue was forecast for three months into the future. This forecast predicted at a day to day level.  **Interpretation of Results**  Top 3 models  **Recommendations**  Targeted prime day sales. |
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