# Predicting Black Friday Consumer Purchase Amounts

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# Agenda

- Overview
- Objective
- About the Data
- Initial Findings
- Model
- Results
- Conclusion
- Further Research

# Overview

In 2019:

- Black Friday and Cyber Monday shopping grossed $16.8 billion dollars in sales (Klebnikov).
- On December 3, 2019 online sales hit $81.5 billion dollars (Klebnikov).
- Holiday shopping sales totaled $730.2 billion dollars (Sherman).

# Objective

- Predict the expenditure a consumer will spend on a single transaction during Black Friday

# About the Data

The data provided demographic information about each consumer. Each consumer had a value in all categories, with the exception of product category. Some consumers only purchased an item in category 1 and/or 2.

Purchase amounts have been converted from Indian Rupees to USD.

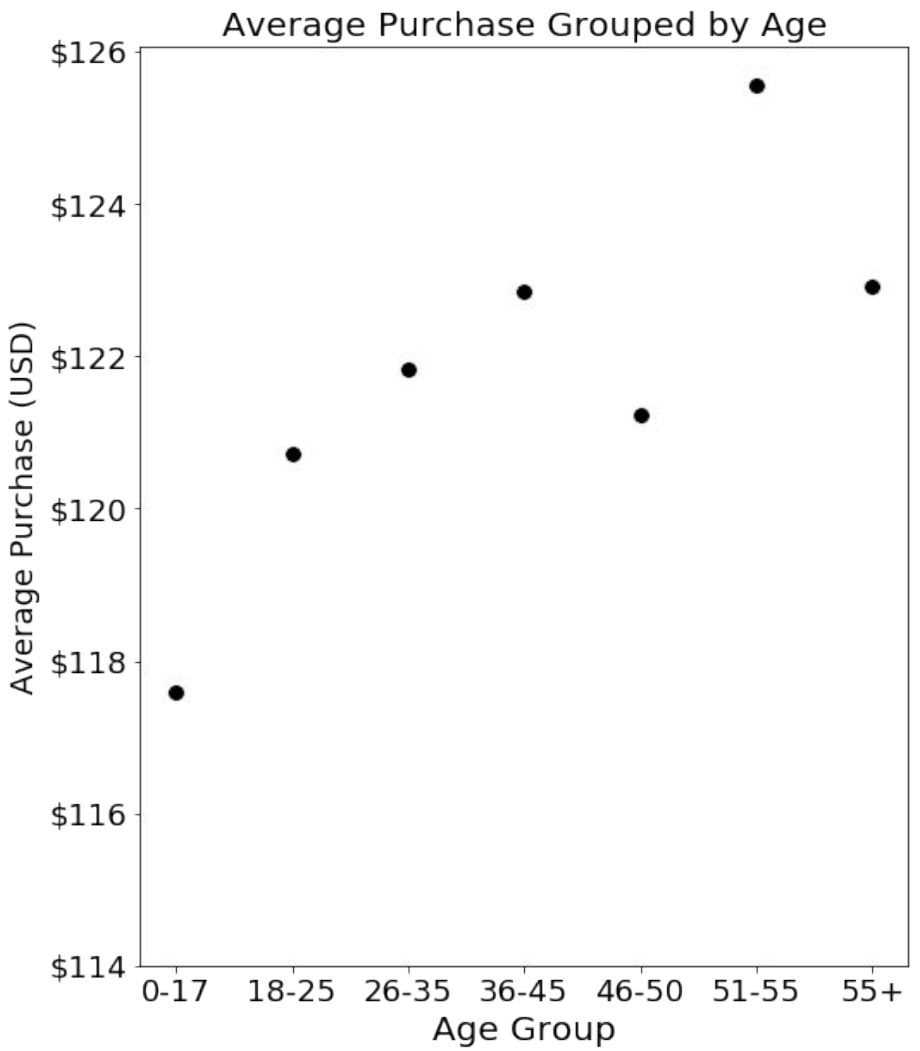
| Categories | Number of Unique Values |
|---|---|
| - Gender | 2 |
| - Age Group | 7 |
| - Occupation | 20 |
| - City | 3 |
| - Years in City | 5 |
| - Marital Status | 2 |
| - Product Category | 3 |
| - Purchase | 18105 |

# **Initial Findings:** Average Purchase Grouped by Age

**Ordered from youngest to oldest, the average purchase is:**

- 0-17 $117.58
- 18-25 $120.69
- 26-35 $121.78
- 36-45 $122.81
- 46-50 $121.20
- 51-55 $125.49
- 55+ $122.88

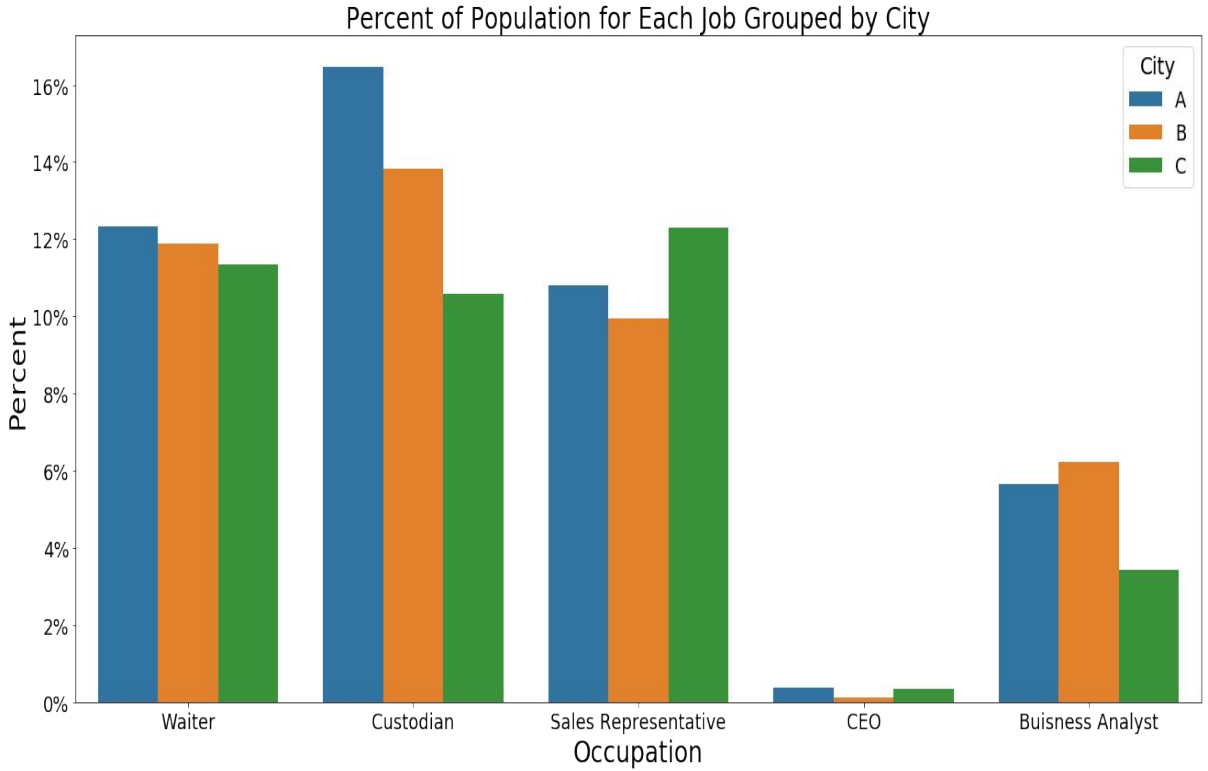
As the model generates predictions, the consumer age group weighs on the process.



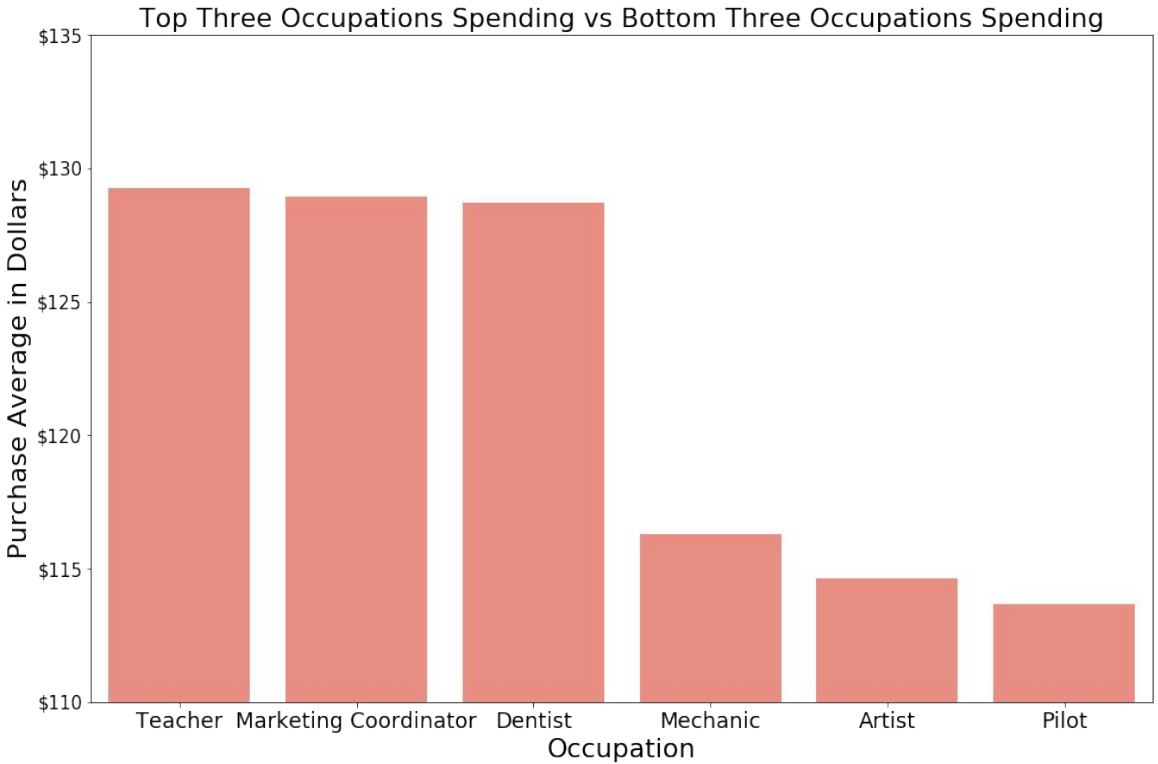
# **Initial Findings:** Percent of Population in an Occupation

- CEO jobs were the least common in all cities (0.12 - 0.38%)
- Custodian positions were most common (10.58-16.46%)

The prediction considers each category such as city and occupation.



# **Initial Findings:** Highest/Lowest Average Spending Grouped by Occupation




- Teachers, Marketing Coordinators, and Dentists have the highest average purchase range from $128.70 - 129.26
- Mechanic, Artist, and Pilot have the lowest average purchase range $113.68-116.30

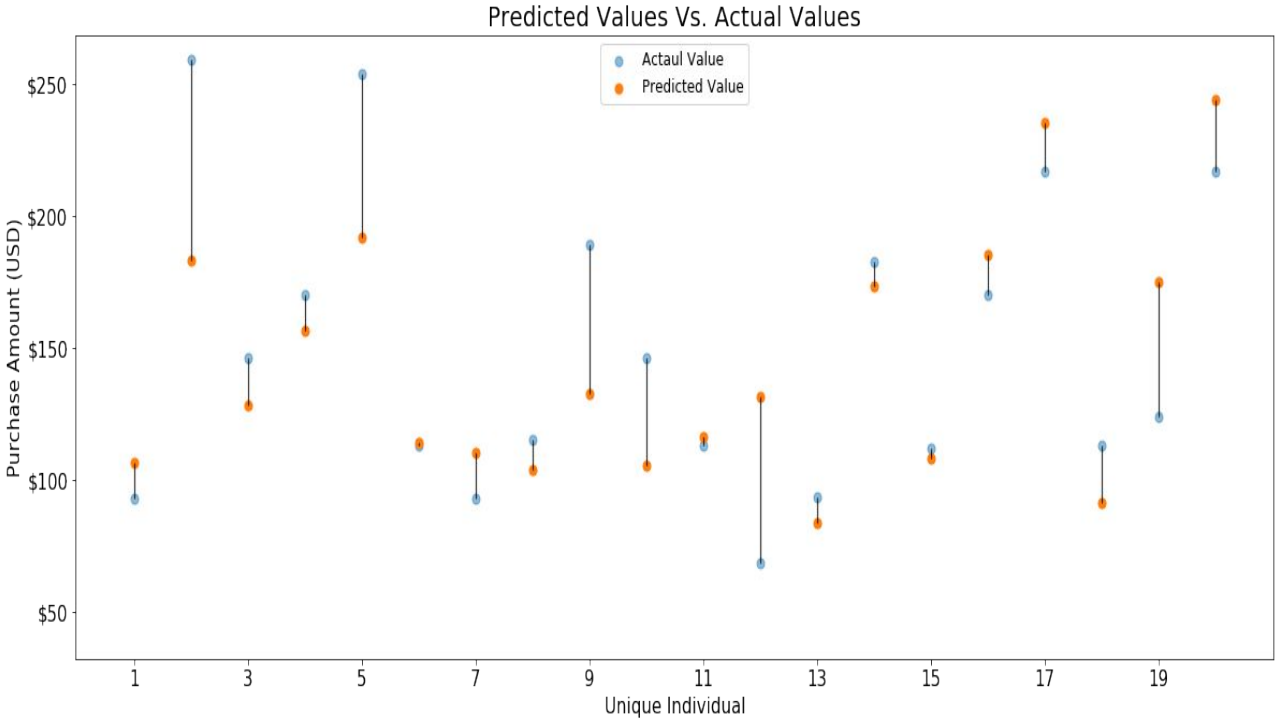
As the model generates a prediction, the consumer's occupation is taken into consideration.

# Creating Predictive Model

- Used all demographic information
- Predicted all customers (not an individual)
- Used previous purchase amount to determine accuracy

# Model

Graph represents model's purchase predictions versus actual purchase amount




- Each unique individual contains their demographic information
- Black line represents difference between values

# Results

Correct predictions within:

-One dollar: 3.78%
-Five dollars: 15.57%
-Fifteen dollars: 40.52%
-Thirty dollars: 67.75%
-Forty dollars : 79.39%

- Total error: 2690

Correct prediction results are significant due to the complexity of predicting a purchase to the penny. Predicting within a purchase range is more realistic.

# Further Work

- Gather more information on purchases, such as online or in-store, to assess impact on purchase amount
- Determine what levels of income have an effect on purchase amount
- Use predictions to help marketing teams create a targeted advertisement to increase sales for the holiday season

# Questions?

# Sources

Klebnikov, Sergei. “Cyber Monday 2019 By The Numbers: A Record $9.4 Billion Haul.” *Forbes*, Forbes Magazine, 3 Dec. 2019, www.forbes.com/sites/sergeiklebnikov/2019/12/03/cyber-monday-2019-by-the-numbers-a-record-94-billion-haul/#52c0a5e92ef0.

Shearman, J. Craig. “NRF Says 2019 Holiday Sales Were up 4.1 Percent.” *NRF,* 16 Jan. 2020, http://nrf.com/media-center/press-releases/nrf-says-2019-holiday-sales-were-41-percent.

Data comes from Analytics Vidhya