

**Better in Bulk: What the Consumer Habits of CAP 5771
Can Reveal Compared Alongside the Average Costco
Customer**

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Introduction

Costco Wholesale is a membership-based wholesale retail chain that was founded in the early 1980s and has since grown into an international phenomenon, with locations in 14 different countries across 4 continents. Its main mission is to provide discounted products – ranging from produce, bakery items, sporting goods, furniture, and even tires and insurance – of the “best value” it can possibly provide to its membership holders (Costco Wholesale Corporation 2025).

Thus far, it has been successful, attracting 76.2 million members – a 7.3% increase from the previous year – as of the close of the 2024 fiscal year despite a \$5 increase to membership prices in September (Costco Wholesale Corporation 2024). While the demographics of Costco memberships have traditionally skewed towards middle-aged adults with families, the demographics of new members have shown a steadily increasing growth of ages 30 - 35 and 20 - 29, belonging to the age groups known as millennials and Generation (Gen) Z, respectively (Foust 2025). Despite the fact that these age groups are the most likely to be enrolled in a degree program – including undergraduate, graduate, and doctoral programs – little research has been done regarding the frequency and density of membership status amongst students, most of whom are young adults that fall within the scope of those age ranges.

Better in Bulk: What the Consumer Habits of CAP 5771 Can Reveal Compared Alongside the Average Costco Customer is a survey-based data mining project that aims to examine the Costco habits of our class alongside those of the average American Costco member by utilizing traditional statistical methods in addition to both supervised and unsupervised learning techniques in order to establish an elementary link between transactional data, socioeconomic circumstance, and demographic characteristics of the modern-day college student.

Research Question(s):

1. What do the motivations and benefits of shopping at Costco tell us about our demographic as students that are young adults?
2. Do our class's Costco habits provide insight into the global trends of Costco consumers when compared against them?
3. What can the limited study of our consumer habits – while of varied socioeconomic circumstances – as students in this time of economic uncertainty reveal about consumer habits in the modern day?

Literature Survey:

In past studies and examinations of consumer behaviors, multiple different sources have found significant links between the demographic characteristics of consumers and their choice of retail store. Nilsson et al. (2014) sought to create a classification system of shoppers based on their choice of store and shopping method (larger infrequent trips versus shorter more frequent trips) and found significant differences in the demographics of each group, including age, income, household size, and access to transportation. Prasad's (2010) study of consumer's choice of supermarket in India and Bai et al. (2008) study in China both also found similar trends, providing more evidence of the correlations, as well as suggesting that these trends are not simply localized occurrences.

Additionally, the formats of retail stores can be an influential factor. Fox et al. (2004) compared different retail formats to see how consumers' behavior change between shopping at supermarkets versus smaller grocery stores and noticed that consumers tend to be more selective in their choice of grocery store but less selective in their choice of supermarket. Thus, supermarkets tend not to compete as directly with each other compared to grocery stores. Costco, as a warehouse club-style retailer, doesn't fit either category, but still exists within the same competitive environment as other stores. Its subscription-based style leads to it facing a higher level of rivalry against other retailers, especially against other warehouse club stores (Crissone 2015). As a result, consumers may be more picky when choosing between Costco and other available options.

Algorithmic Processes:

The collected data will be stored in Excel spreadsheets and imported into Python through Jupyter Notebooks in Google Colab. Python's libraries of statistical analysis and machine learning functions will then be used to search for trends and create models to explain these trends as well as form predictions of future consumers' habits. Namely the PANDAS and SciKit libraries for χ^2 tests, ANOVA tests, linear regression and the construction of a perceptron.

Expected Experiments, Analysis and Datasets:

For statistical analysis, χ^2 tests to compare the distributions of demographic data with choice of store and ANOVA tests to compare demographic data with time spent in-store and amount of money spent per trip will be used. For modelling, a linear regression will be used to attempt to explain the relationship between time spent in-store and the amount spent per visit. Also, a perceptron trained to use the demographic and behavioral characteristics of consumers to predict Costco membership will be created, using the previous tests to determine the classifiers to be used and their starting weights.

The datasets we aim to use are split between data collected from students in the class in addition to publicly available data from Costco's shareholder documents and other reputable sources. The dataset consisting of data collected from students in the class includes demographic information, membership status, transaction data, and any other relevant information participating students would like to share. The additional sets of data come from Costco's earnings documents from the 2025 fiscal year upon their publication in November as well as website articles containing information from independent research regarding statistics including but not limited to average time spent in Costco and average transaction cost.

Milestones:

As our project proposal presentation is on Wednesday, October 8th, we aim to have the presentation finished by Monday, October 6th and the survey by Tuesday, October 7th. Following the presentation, we will post reminder discussions each Monday and Friday for students to fill out the survey for each time they go to Costco. The survey will be open for four weeks from Friday, October 10th until Friday, November 7th at 11:59 pm, which we believe will give us ample time to perform our analysis in addition to completing the rest of the paper before the final due date of Tuesday, November 25th.

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