

Research Question:

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1 Broad Question/Background

We aim to study the relationship between liquor sales in the state of Iowa and their total income. This project utilizes the Iowa liquor sales dataset from the state of Iowa's website and the OWI revocations report from the Iowa Department of Transportation to explore patterns in alcohol consumption and sales across the state. The analysis will focus on understanding how customer demographics influence liquor purchases and examining seasonal trends in liquor sales throughout the year. These insights can help reveal consumer behavior patterns and the impact of various factors on alcohol sales in Iowa.

1.1 Sub-Question 1:

How does customer demographic affect the type of liquor sales?

Understanding the type of market that liquor stores are located in can influence the type of stock for certain areas. Two factors we will be focusing our study on are income and ethnicity. Furthermore, focusing on ZIP Codes near Iowa universities can provide insight into potential generational differences in alcohol purchasing patterns[2].

1.2 Sub-Question 2:

How do liquor sales vary across the year?

Part of our study will focus on how sales vary throughout the year, which affects individual retailers but can also provide valuable knowledge on times when alcohol purchases and consumption are higher than average. Comparing liquor sales over the years may also reveal any changes in the type of alcohol being purchased in certain areas, suggesting changing market preferences.

2 Preliminary Data

2.1 Iowa Liquor Sales Data

This dataset[3] was started on 2014-01-01 and last updated on 2024-09-01. It contains 29,667,436 instances and has 24 variables. We will be focusing on the date, zip code, county, category name, item description and sale (dollars).

2.2 Iowa Income Tax Data

This dataset[4] comes from the IRS government website and has the records of all of Iowa's individual tax statistics based on zip code.

2.3 Census

This dataset^[1] comes from the United States Census Bureau's website. It includes many different types of information but we are planning on focusing on race/ethnicity.

3 Preliminary Methods

Our plan is to conduct our analysis using Python within a Google Colab notebook. Our primary dataset is related to Iowa liquor sales, and we plan to merge other datasets on income statistics and Census demographic data using zip codes and county information.

Our data visualizations will feature maps to understand where liquor sales are concentrated, and charts to better identify trends within the different types of liquor sales. This may include interactive graphs and charts created in tableau.

We will also be looking into sales forecasting in order to project future alcohol sales in Iowa as well as for some of the top selling stores. We will incorporate both supervised and unsupervised algorithms. The unsupervised learning will be to discover patterns within the data and the supervised algorithms will be to forecast future sales.

References

- [1] U. S. C. Bureau. State iowa, 2022. Accessed: 09-01-2024.
- [2] A. Burgess. More options...less time' in the 'hustle culture' of 'generation sensible': Individualization and drinking decline among twenty-first century young adults. *The British journal of sociology* vol. 73,4, 2022. Accessed: 09-01-2024.
- [3] A. B. D. Commerce. Iowa liquor sales, 2024. Accessed: 09-01-2024.
- [4] IRS. Soi tax state individual income tax statistics 2021 zip code data (soi), 2023. Accessed: 09-01-2024.