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BAIS 6050: Database Management and Visual Analytics
4 December 2020

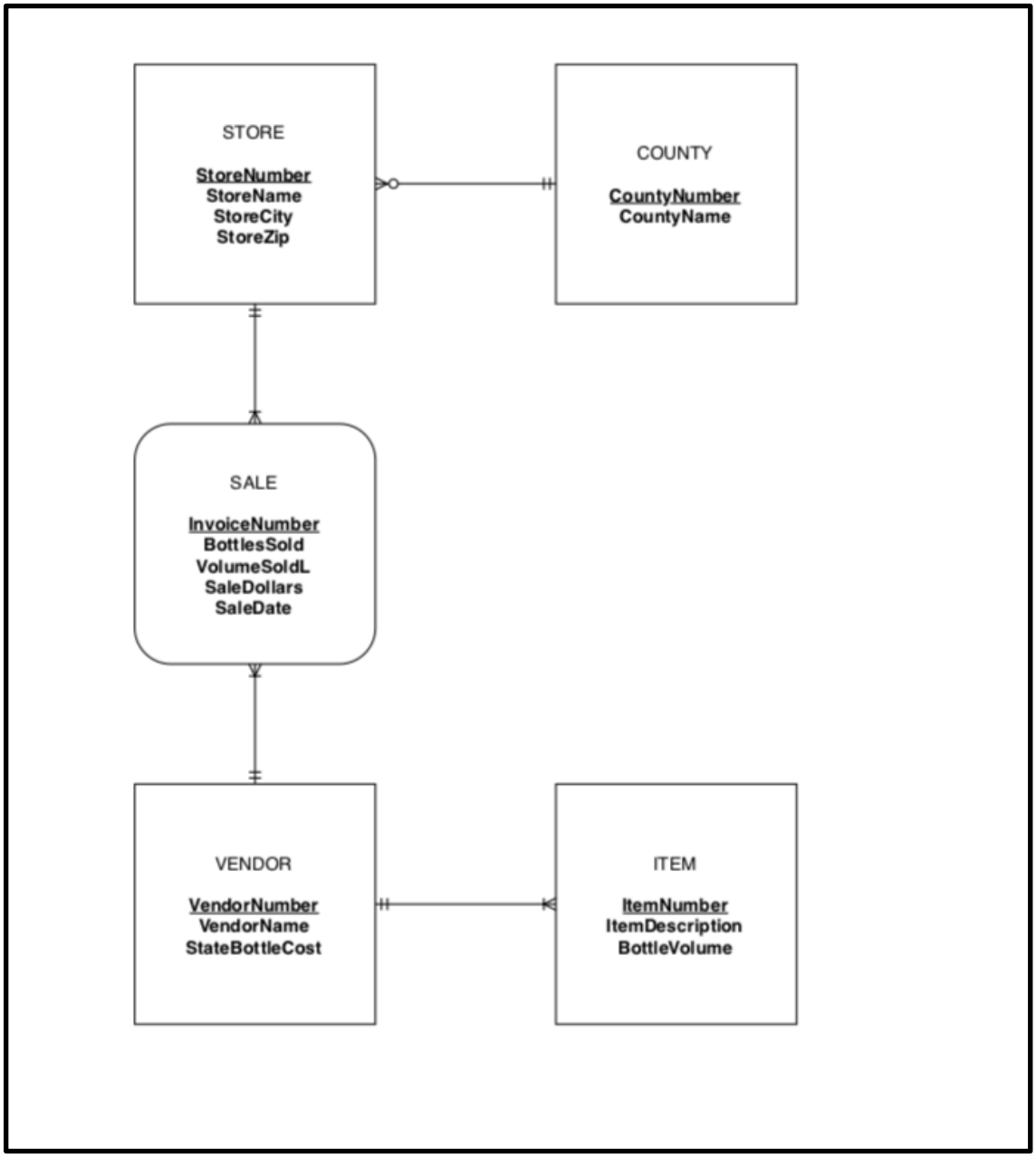
# Iowa Liquor Sales Report

## I. Business Problem & Dataset

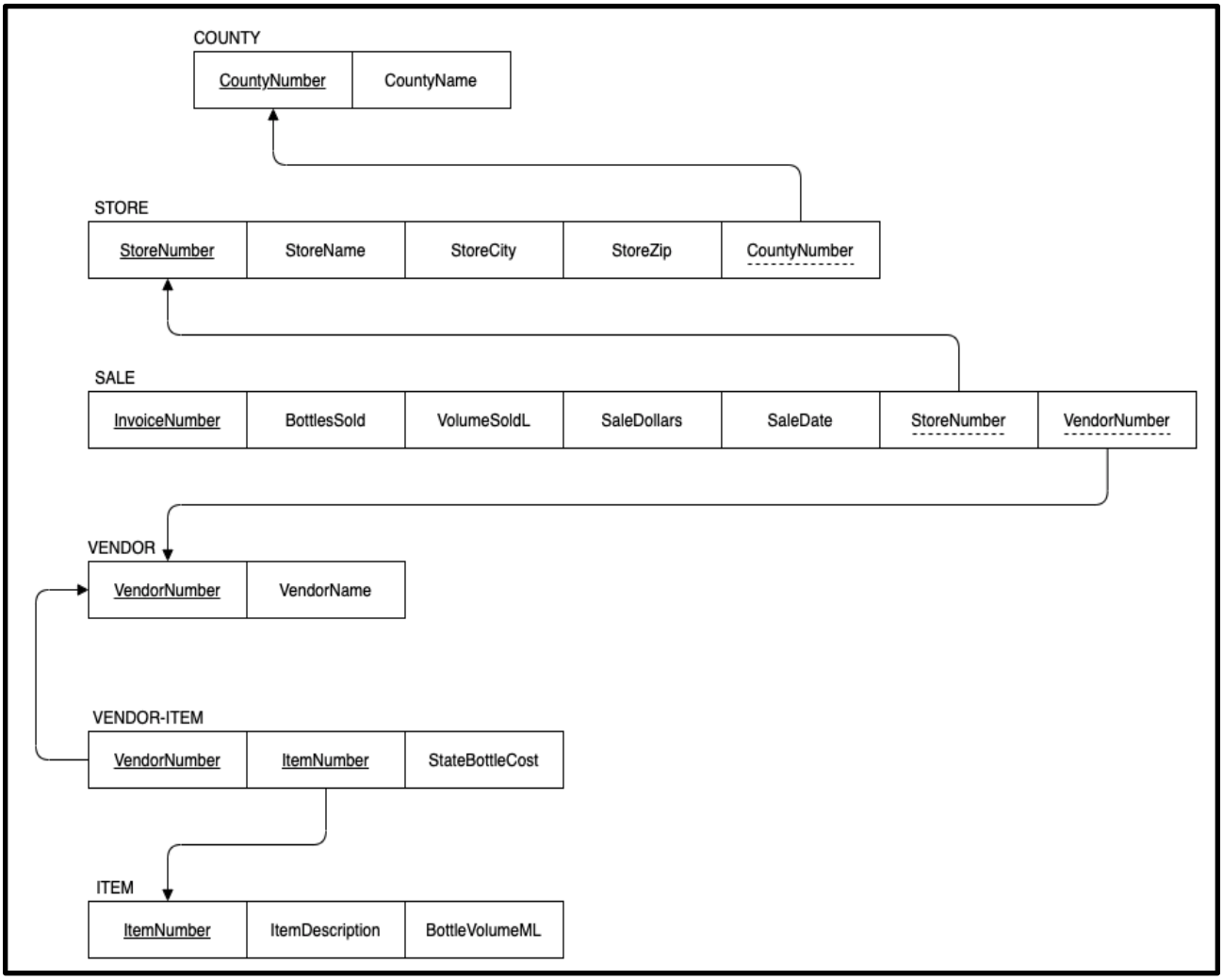
Since the onset of the COVID-19 pandemic, millions of Americans have embraced a lifestyle of social distancing. Industries that are dependent on in-person contact to deliver their services have felt the full burden of this massive shift in lifestyle, and consequently have suffered significant losses. However, one reality remains clear during the pandemic- it has not stopped Americans from mixing their cocktails. In fact, the rates at which consumers are purchasing alcohol in 2020 have climbed dramatically. An analysis of Nielsen's market data concludes, "total alcohol sales outside of bars and restaurants have surged roughly 24% during the pandemic". Due to lockdowns around the country, consumers have been unable to attend bars and have resorted to purchasing liquor in larger quantities than ever before. This boom in alcohol demand creates a business opportunity for entrepreneurs. Ultimately, if a liquor store is opened in the optimal location, the potential for success is imminent.

To identify the optimal location to open a liquor store in the state of Iowa, a dataset containing every non-restaurant liquor sale was obtained by Kaggle. The dataset contains years of sales in each of Iowa's 99 counties and this valuable information can be used as a compass to detect trends in consumer behavior. The final dataset was filtered to all sales within the last two years and consisted of 17 columns and 2,942,650 rows.

## II. Entity Relationship Diagram



## III. Relational Schema



**IV. Data Analysis & Queries**

**Sales by City**

```
SELECT StoreCity, CONCAT('$', SUM(SaleDollars))AS "TOTALREVENUE"
FROM STORE_T JOIN SALE_T
ON STORE_T.StoreNumber = SALE_T.StoreNumber
GROUP BY StoreCity
ORDER BY SUM(SaleDollars) DESC;
```

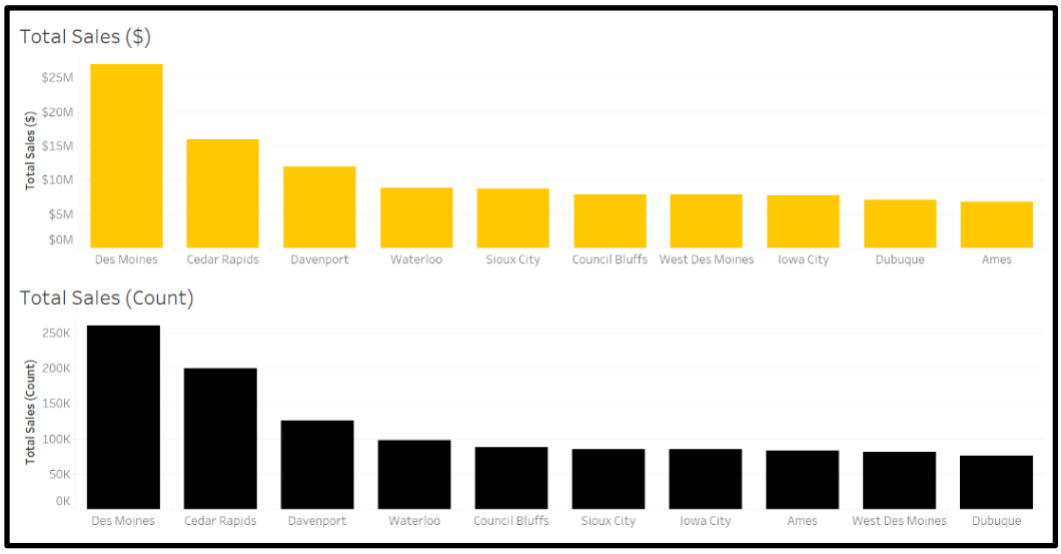
| | STORECITY | TOTALREV... |
|---|---|---|
| 1 | des moines | $26918309.35 |
| 2 | cedar rapids | $15981880.29 |
| 3 | davenport | $11905029.63 |
| 4 | waterloo | $8780756.34 |
| 5 | sioux city | $8700511.87 |
| 6 | council bluffs | $7805104.33 |
| 7 | west des moines | $7785202.96 |
| 8 | iowa city | $7703957.98 |
| 9 | dubuque | $7038285.28 |
| 10 | ames | $6773533.15 |

This is the query that was used to determine the sales numbers for each city in Iowa. We wanted to know this information because it would tell us the prime locations to sell alcohol in the state of Iowa. The first query uses the sum of sale dollars to give us the total revenue from each city. The query is then ordered in descending order by that sum to give us the top sales for each city.

```
SELECT StoreCity, COUNT(SALE_T.StoreNumber) AS "TOTALSTORES"
FROM SALE_T, STORE_T
WHERE SALE_T.StoreNumber = STORE_T.StoreNumber
GROUP BY StoreCity
ORDER BY COUNT(SALE_T.StoreNumber) DESC;
```

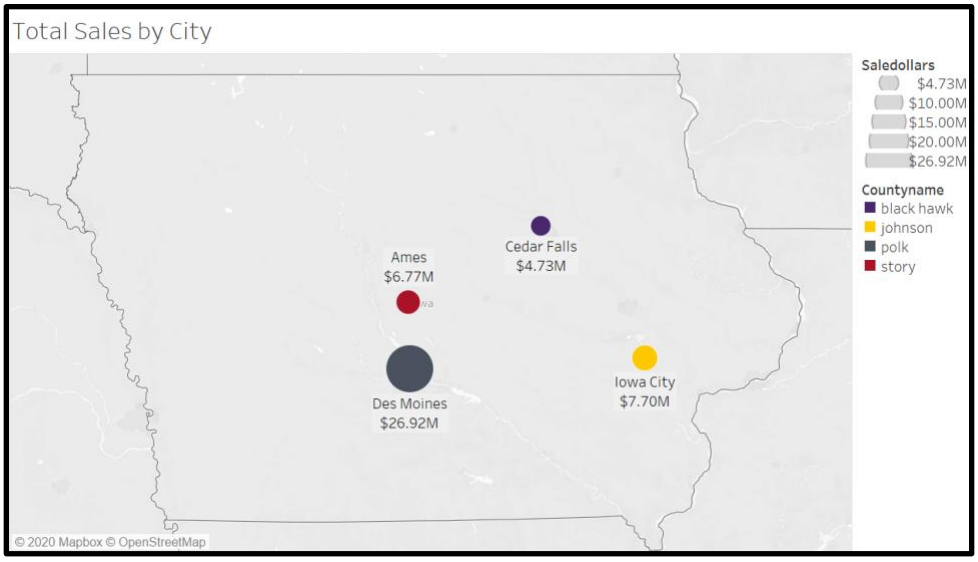
| | STORECITY | TOTALSTORES |
|---|---|---|
| 1 | des moines | 260006 |
| 2 | cedar rapids | 199438 |
| 3 | davenport | 125496 |
| 4 | waterloo | 97878 |
| 5 | council bluffs | 87941 |
| 6 | sioux city | 84900 |
| 7 | iowa city | 84516 |
| 8 | ames | 82831 |
| 9 | west des moines | 80936 |
| 10 | dubuque | 75648 |

The second query is similar to the first, but this time we used the count of store numbers in the sales table to determine how many times a store recorded a sale. This information is important because some stores may have fewer high dollar sales while other stores may have more low dollar sales. We wanted to see if this idea changed which cities were at the top of the list.



The visualizations that we created show the top 10 cities in Iowa for both total count of sales and sum of sales dollars. Our hypothesis was that larger cities would have higher liquor sales than other cities. If the ranking were based on population it would be Des Moines, Cedar Rapids, Davenport, Sioux City, Iowa City, West Des Moines, Ankeny, Waterloo, Ames, and Council Bluffs.

We discovered that alcohol sales generally correlate to population with a few exceptions such as Waterloo jumping up from 8th in population to 4th in sales, and Council Bluffs jumping up from 10th in population to 5th in sales. For our next visualization, we decided to make a map focusing on the highest seller, Des Moines, and the three main college towns in Iowa.




Coming into this project, we had the idea that college towns would have higher alcohol sales than other cities. We also wanted to compare the alcohol sales between the three main college towns in Iowa. We found that Iowa City had the highest sales total with $7.7 Million in sales, followed by Ames with $6.77 Million, and Cedar Falls with $4.73 Million.

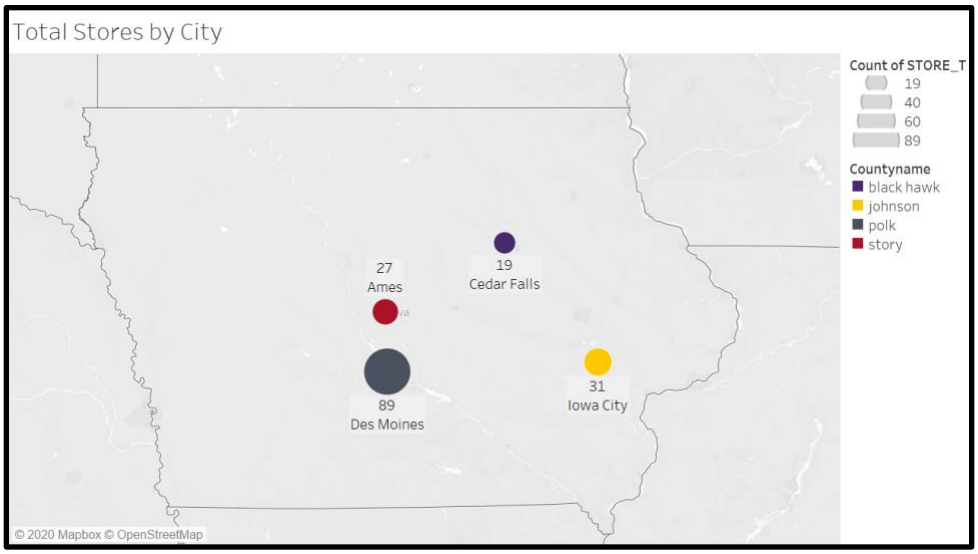
**Stores By City**

We also wanted to see how many stores were in each city. Below is the query we used to determine how many liquor stores there were in each city in Iowa. We selected the name of the city the store is in, as well as the count of how many store names there are in the state. We grouped by StoreCity in order to retrieve the count of all the store names that exist in each individual city. To figure out which cities had the most stores, we decided to sort the data in descending order by the number of stores.

```
SELECT StoreCity, COUNT(StoreName) AS "TOTALSTORES"
FROM STORE_T
GROUP BY StoreCity
ORDER BY COUNT(STORE_T.StoreName) DESC;
```

| | STORECITY | TOTALSTORES |
|---|---|---|
| 1 | des moines | 89 |
| 2 | cedar rapids | 85 |
| 3 | davenport | 53 |
| 4 | waterloo | 47 |
| 5 | council bluffs | 44 |
| 6 | sioux city | 38 |
| 7 | dubuque | 37 |
| 8 | west des moines | 33 |
| 9 | iowa city | 31 |
| 10 | ames | 27 |

In order to be consistent with the sales by city map, we decided to use a similar visualization for stores by city. As you can see, the results of this query followed very closely alongside the sales in each city. Des Moines has the largest market with 89 stores. Then, of the college towns, Iowa City has the most liquor stores with 31 stores, followed by Ames with 27 stores and Cedar Falls with 19 stores. This makes sense, as Iowa City also had the most sales revenue.



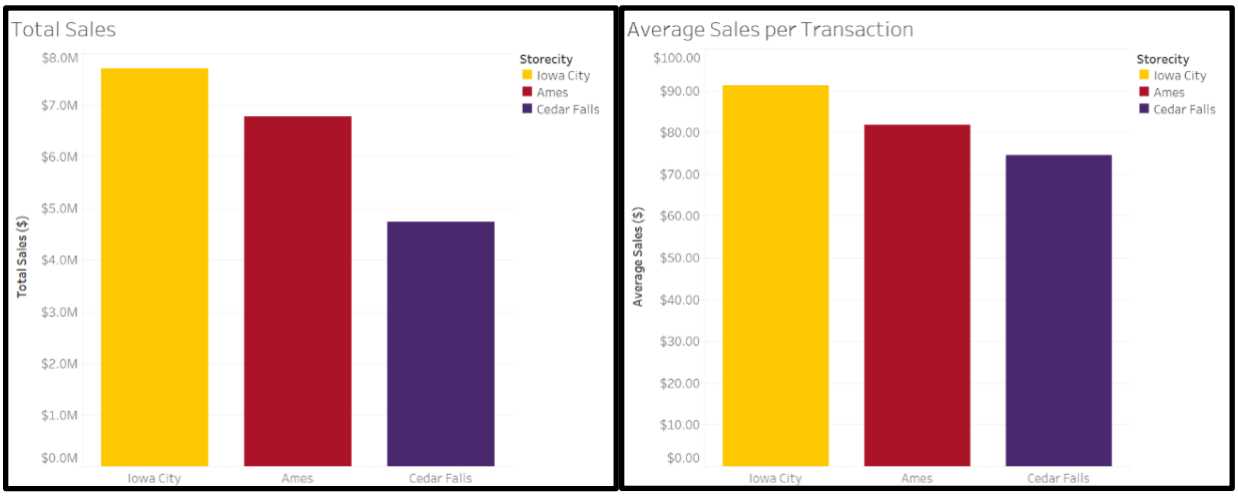

**College Towns**

Next, we wanted to determine which college town had the largest sales value. This query will determine total sales revenue and the average dollar amount per sale in college towns. We joined the Store and Sale tables based on Store Number so we could pull the sales data for each individual store. We only wanted to pull the college towns for this one, so we pulled the data where Store City was Iowa city, Ames, or Cedar Falls. We grouped by Store city so we could get the aggregate data for each college town individually. The “concat” was used to place the dollar sign in front of the sales data.

```
SELECT StoreCity, CONCAT('$', ROUND(AVG(SaleDollars), 2)) AS "AVERAGEREVENUE",
CONCAT('$', SUM(SaleDollars)) AS "TOTALREVENUE"
FROM STORE_T JOIN SALE_T ON STORE_T.StoreNumber = SALE_T.StoreNumber
WHERE StoreCity IN ('iowa city','ames', 'cedar falls')
GROUP BY StoreCity
ORDER BY "AVERAGEREVENUE" DESC;
```

For our next visualization we decided to use bar graphs to compare the total and average dollar values for liquor sales in college towns. As you can see Iowa City has the highest dollar amount of liquor sales of all the college towns. Followed by Ames and Cedar Falls. This was the

same as our hypothesis, which we made based on party school rankings and enrollment. Enrollment for the University of Iowa was 31,240, Iowa State was 33,391 and UNI was 10,497 students. Another interesting thing about these results is that the average dollar amount per sale is higher in Iowa city than the other 2 college towns. This was surprising as we did not expect there to be much difference between the average dollar sales value in college towns.




**Vendors**

The next thing that we wanted to look further into is what vendors are the most popular in the state of Iowa as well as college towns. We used the count of transactions from these vendors instead of dollar amounts in order to reduce the skew of pricing. Here is our query, which is just a simple join query showing Vendor Name and count of that vendor in descending order.

```
SELECT VendorName, COUNT(SALE_T.VendorNumber)
FROM VENDOR_T, SALE_T
WHERE VENDOR_T.VendorNumber = SALE_T.VendorNumber
GROUP BY VendorName
ORDER BY COUNT(SALE_T.VendorNumber) DESC;
```

Our hypothesis was that vendors who sell lower priced liquor would be more popular in college towns and that, at the state level, a mid-level priced vendor would be most popular. What

we ended up seeing was that the same top 3 vendors are most popular in the state and the college towns. Diageo, as you can see, is the most popular vendor by far. Diageo sells brands including Crown Royal, Ciroc, Smirnoff, Don Julio, and Captain Morgan. This was most surprising for the college towns as these brands are expensive. Jim Beam sells different bourbons and Pernod Ricard sells Seagram's, Jameson, Malibu and Absolut. The biggest takeaway from this query was that higher-priced alcohol is the most popular in college towns and in the state of Iowa and that Diageo is the most popular vendor by far.

Most Popular Vendors

| Vendorname | |
|---|---|
| Diageo Americas | 52,930,068 |
| Jim Beam Brands | 20,320,524 |
| Pernod Ricard USA/Austin Nichols | 17,973,818 |
| Sazerac Co., Inc. | 17,825,228 |
| Luxco-St Louis | 14,952,663 |
| Constellation Wine Company, Inc. | 12,913,345 |
| Brown-Forman Corporation | 12,714,838 |
| Bacardi U.S.A., Inc. | 11,238,204 |
| Proximo | 8,013,855 |
| Heaven Hill Brands | 7,672,309 |

| Storecity | Vendorname | |
|---|---|---|
| Ames | Diageo Americas | 1,564,255 |
| | Jim Beam Brands | 534,152 |
| | Pernod Ricard USA/Austin Nichols | 516,865 |
| | Luxco-St Louis | 418,732 |
| | Sazerac Co., Inc. | 393,173 |

| | | |
|---|---|---|
| Cedar Falls | Diageo Americas | 1,000,892 |
| | Pernod Ricard USA/Austin Nichols | 422,761 |
| | Jim Beam Brands | 408,181 |
| | Sazerac Co., Inc. | 358,867 |
| | Luxco-St Louis | 304,648 |

| | | |
|---|---|---|
| Iowa City | Diageo Americas | 1,438,748 |
| | Pernod Ricard USA/Austin Nichols | 695,204 |
| | Jim Beam Brands | 645,562 |
| | Luxco-St Louis | 475,557 |
| | Bacardi U.S.A., Inc. | 412,396 |

## Conclusion

Our analysis showed that Iowa City has the best market for alcohol sales among college towns which we expected to see due to party school rankings and population or enrollment. Des Moines has the largest market of all cities in Iowa. This is due to the high correlation between population and alcohol sales. We also found that higher end products have a significantly higher demand than cheaper alcohol, even in the college towns.