

Iowa Liquor Sales

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Data Science Immersive



Why Are We Here?

- Investigating market data to determine potential locations for a liquor store owner in Iowa to open a new storefront
- Recommending locations by type of your choice based upon model performance

The Data

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SOURCE : State of Iowa

- Individual sales transactions from state to stores that hold class E liquor license

SIZE : 2.7 Million Observation

- Utilizing 10% subset

DETAILS

- Location information : County, City, Zip Code
- Alcohol information : Category, Type, Volume
- Store/vendor information
- Sales information : Dollar Amount & Volume

	Date	Store Number	City	Zip Code	County Number	County	Category	Category Name	Vendor Number	Item Number	Item Description	Bottle Volume (ml)	State Bottle Cost	State Bottle Retail	Bottles Sold	Sale (Dollars)
0	11/4/15	3717	SUMNER	50674	9.0	Bremer	1051100.0	APRICOT BRANDIES	55	54436	Mr. Boston Apricot Brandy	750	\$4.50	\$6.75	12	\$81.00
1	3/2/16	2614	DAVENPORT	52807	82.0	Scott	1011100.0	BLENDED WHISKIES	395	27605	Tin Cup	750	\$13.75	\$20.63	2	\$41.26
2	2/11/16	2106	CEDAR FALLS	50613	7.0	Black Hawk	1011200.0	STRAIGHT BOURBON WHISKIES	65	19067	Jim Beam	1000	\$12.59	\$18.89	24	\$453.36
3	2/3/16	2501	AMES	50010	85.0	Story	1071100.0	AMERICAN COCKTAILS	395	59154	1800 Ultimate Margarita	1750	\$9.50	\$14.25	6	\$85.50
4	8/18/15	3654	BELMOND	50421	99.0	Wright	1031080.0	VODKA 80 PROOF	297	35918	Five O'clock Vodka	1750	\$7.20	\$10.80	12	\$129.60
5	4/20/15	2569	CEDAR RAPIDS	52402	57.0	Linn	1041100.0	AMERICAN DRY GINS	205	31473	New Amsterdam Gin	1750	\$13.32	\$19.98	6	\$119.88
6	8/5/15	2596	OTTUMWA	52501	90.0	Wapello	1051010.0	AMERICAN GRAPE BRANDIES	85	52806	Korbel Brandy	750	\$6.66	\$9.99	3	\$29.97
7	6/25/15	3456	CLEAR LAKE	50428	17.0	Cerro Gordo	1012100.0	CANADIAN WHISKIES	65	10628	Canadian Club Whisky	1750	\$15.75	\$23.63	2	\$47.26
8	1/4/16	4757	BONDURANT	50035	77.0	Polk	1032080.0	IMPORTED VODKA	370	34006	Absolut Swedish Vodka 80 Prf	750	\$11.49	\$17.24	4	\$68.96
9	11/10/15	4346	SHELLSBURG	52332	6.0	Benton	1081315.0	CINNAMON SCHNAPPS	65	82610	Dekuyper Hot Damn!	1000	\$7.62	\$11.43	2	\$22.86

Exploratory Data Analysis

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Location, Location, Location...

- Feature must be selected to serve as the location indicator when offering recommendations
- Select feature that best narrows scope of data for model building
 - County : 99 unique values

In the dataset there are:

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412 Unique Zip Codes

99 Unique Counties

382 Unique Cities

1378 Unique Stores

Aggregating Data by County

- Grouping & sorting data by location indicator to investigate top performing counties in terms of sales

	Bottle Volume (ml)	State Bottle Cost	State Bottle Retail	Bottles Sold	Sale (Dollars)	Volume Sold (Liters)
County						
Polk	879.307516	10.125470	15.203342	579515	7.745493e+06	502285.97
Linn	868.288418	9.478968	14.233061	245741	3.139594e+06	219137.92
Scott	869.044684	9.615335	14.437356	204885	2.457029e+06	162290.15
Johnson	892.648181	10.241522	15.377705	147638	2.077858e+06	129627.87
Black Hawk	856.633943	9.350094	14.040122	172391	1.924159e+06	131429.99

Model Building

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Optimizing Location

- How does volume sold, bottles sold, & state bottle retail impact sales in different counties?
 - Stats Models library
 - Multiple Linear Regression model
 - 76.8% variance in data explained by model (r^2 score)

Optimizing Sales

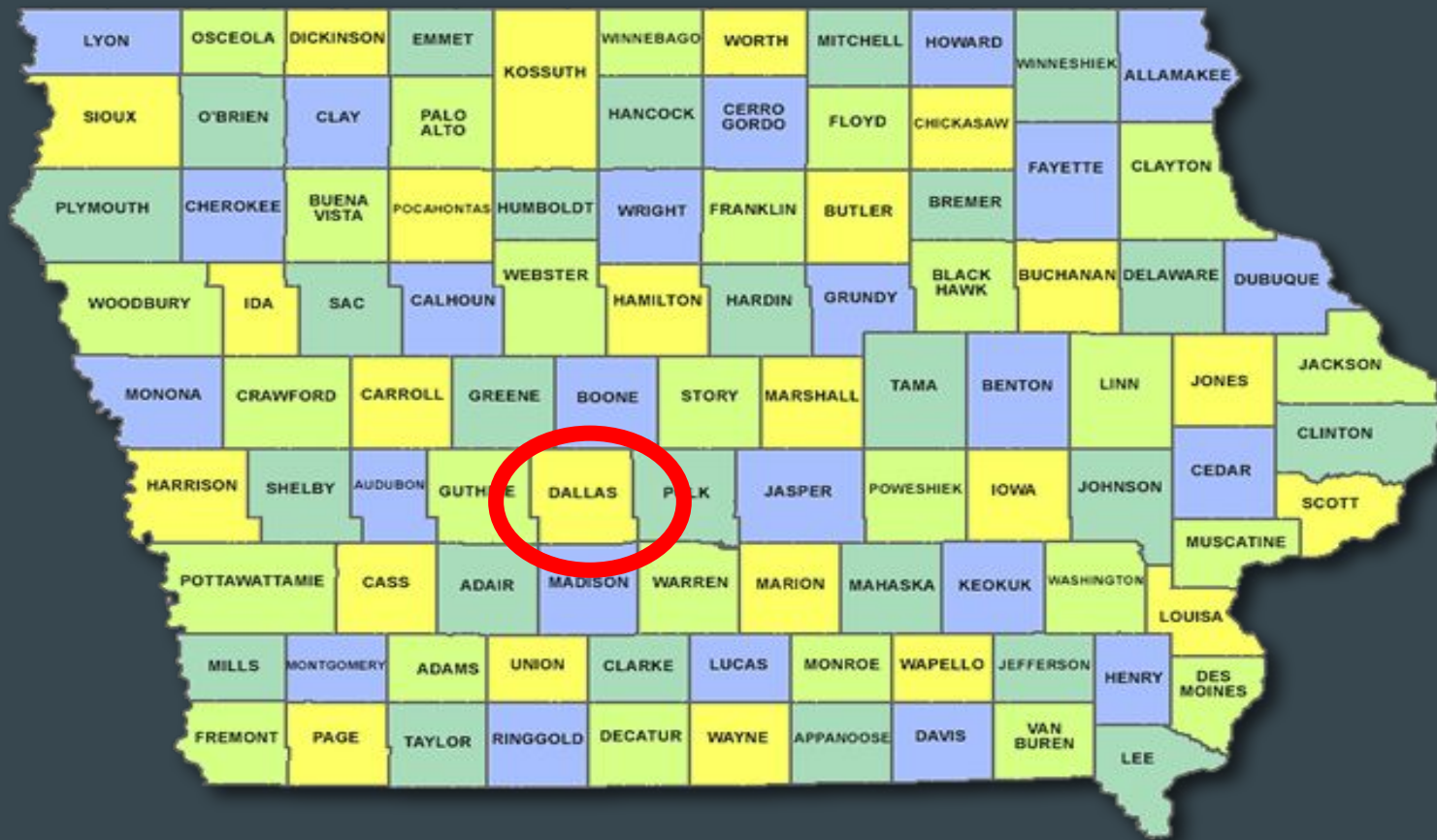
- How does volume sold, bottles sold, & state bottle retail impact sales in optimal locations identified?
 - Scikit-Learn library
 - Multiple Linear Regression model
 - 75.6% variance in data explained by model (accuracy score)

The Conclusions



Optimal Locations

- Measuring the increase in sales per transaction compared to baseline county (Adams), holding all other factors equal
 - Dallas County - \$57.93
 - Johnson County - \$21.54
 - Pottawattamie County - \$18.61



Dallas County

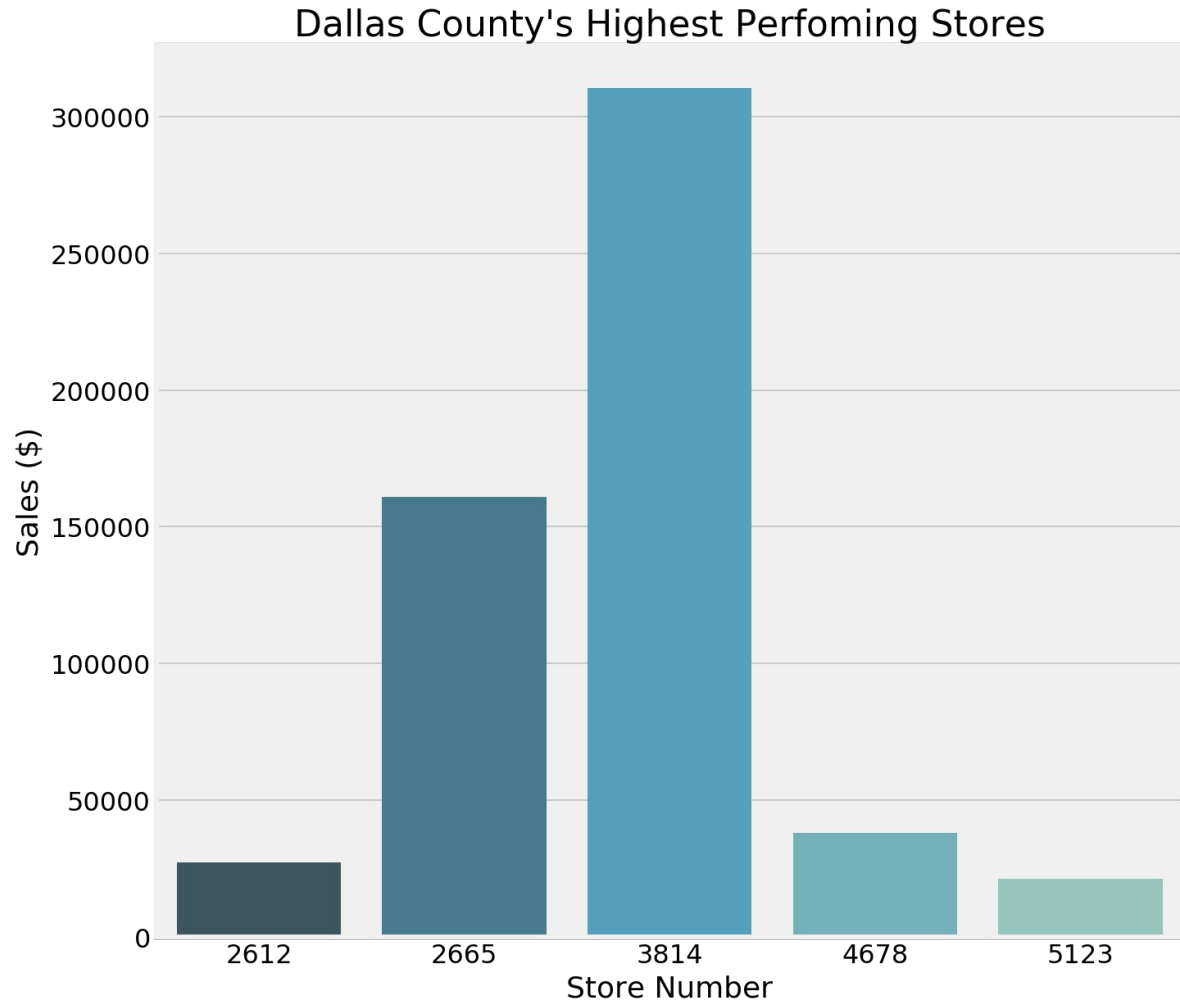
- West of Des Moines
- Population : 66,135
- Area : 592 square miles
- Major Highway : Interstate 80
- Most Populous Cities :
 - West Des Moines
 - Urbandale
 - Clive



Optimal Sales

- Measuring the increase in sales per transaction of stores in Dallas County as a result of bottles and volume sold, holding all other factors equal.
 - Bottles Sold- \$15.74
 - Volume Sold - \$3.06

- Further develop sales strategy by investigating the top 5 selling stores in Dallas County



Thank you!
Q & A

