```
+-----+-----------+-----+------------+--------------------+
|state|       city|stars|review_count|                name|
+-----+-----------+-----+------------+--------------------+
|  ABE|  Vancouver|  4.5|          14| Kitanoya Guu Garlic|
|   BC|    BURNABY|  3.5|          59|                IHOP|
|   BC|    BURNABY|  2.5|          31|                IHOP|
|   BC|Bowen Island|  5.0|          8|    Shika Provisions|
|   BC|Bowen Island|  4.5|         26|Cocoa West Chocol...|
|   BC|Bowen Island|  4.5|         13|Barcelona Tapas &...|
|   BC|Bowen Island|  4.0|         52|  Tuscany Restaurant|
|   BC|Bowen Island|  4.0|         40|      The Snug Cafe|
|   BC|Bowen Island|  4.0|         30|Artisan Eats Cafe...|
|   BC|Bowen Island|  4.0|         24|    Bowen Island Pub|
|   BC|Bowen Island|  4.0|         22|     Rustique Bistro|
|   BC|Bowen Island|  4.0|         16|     Miksa Restaurant|
|   BC|Bowen Island|  4.0|          9|     Branch on Bowen|
|   BC|Bowen Island|  4.0|          6|          Sushi to Go|
|   BC|Bowen Island|  3.5|         51|Doc Morgan's Pub ...|
|   BC|Bowen Island|  3.5|          7|Lime and Moon Pie...|
|   BC|Bowen Island|  3.5|          6|            Leftbank|
|   BC|    Burnaby|  5.0|          7| Active Body Burnaby|
|   BC|    Burnaby|  5.0|          7| Five Loaves Two Fish|
|   BC|    Burnaby|  5.0|          6|SOCRATES in the H...|
+-----+-----------+-----+------------+--------------------+
```

Figure 1: Top Rated Restaurant Based on Sorting by Rating and Review Count

```
+-----+---------+-----------+------------------+
|state|     city|postal_code|total_review_count|
+-----+---------+-----------+------------------+
|   TX|   Austin|      78704|            124492|
|   FL|  Orlando|      32819|            121451|
|   TX|   Austin|      78701|            120005|
|   OR| Portland|      97214|            104339|
|   MA|   Boston|      02116|             93835|
|   OR| Portland|      97209|             74662|
|   OR| Portland|      97204|             65349|
|   MA|   Boston|      02113|             64217|
|   TX|   Austin|      78702|             63891|
|   MA|Cambridge|      02138|             58856|
|   MA|Cambridge|      02139|             58794|
|   OR| Portland|      97205|             57987|
|   GA|  Atlanta|      30309|             54481|
|   OR| Portland|      97202|             53466|
|   GA|  Atlanta|      30308|             51272|
|   GA|  Atlanta|      30318|             50933|
|   OH| Columbus|      43215|             49479|
|   FL|  Orlando|      32803|             49345|
|   TX|   Austin|      78758|             48169|
|   MA|   Boston|      02111|             46514|
+-----+---------+-----------+------------------+
```

Figure 2: High Customer Flow Based on Restaurant Rating Count Distribution

Yelp Rating Distribution By State By Star

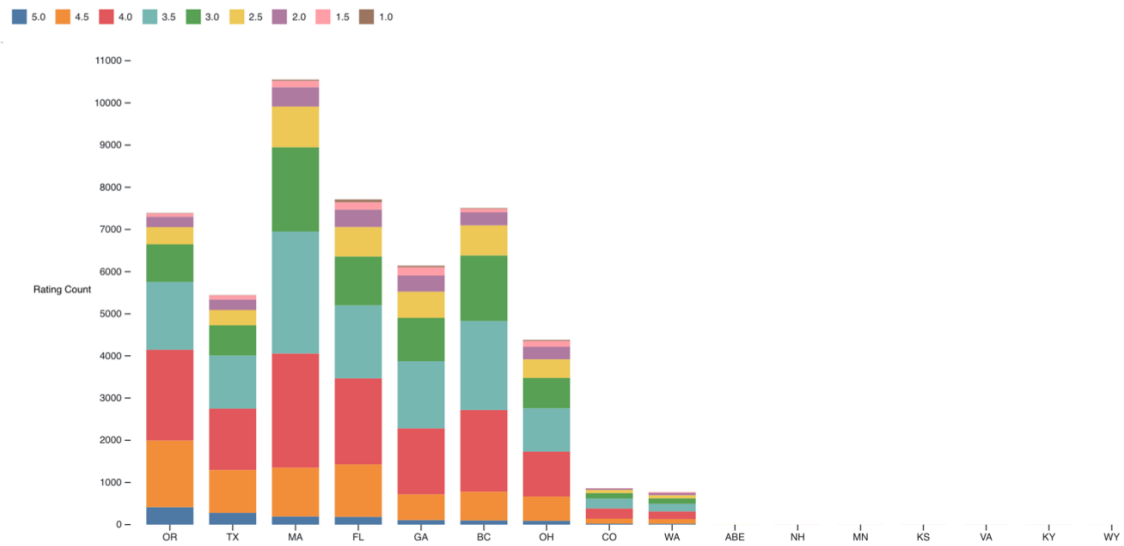■ 5.0 ■ 4.5 ■ 4.0 ■ 3.5 ■ 3.0 ■ 2.5 ■ 2.0 ■ 1.5 ■ 1.0

Figure 3: Yelp Restaurant Rating Distribution by State by Star

■ true
■ false
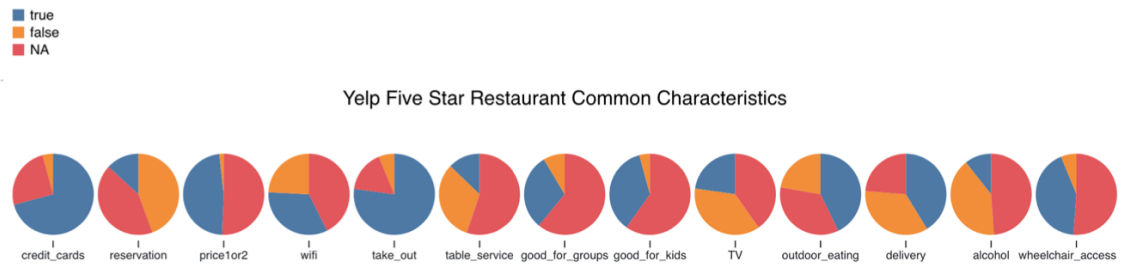■ NA

Yelp Five Star Restaurant Common Characteristics

Figure 4: Yelp Five Star Restaurant Common Characteristics

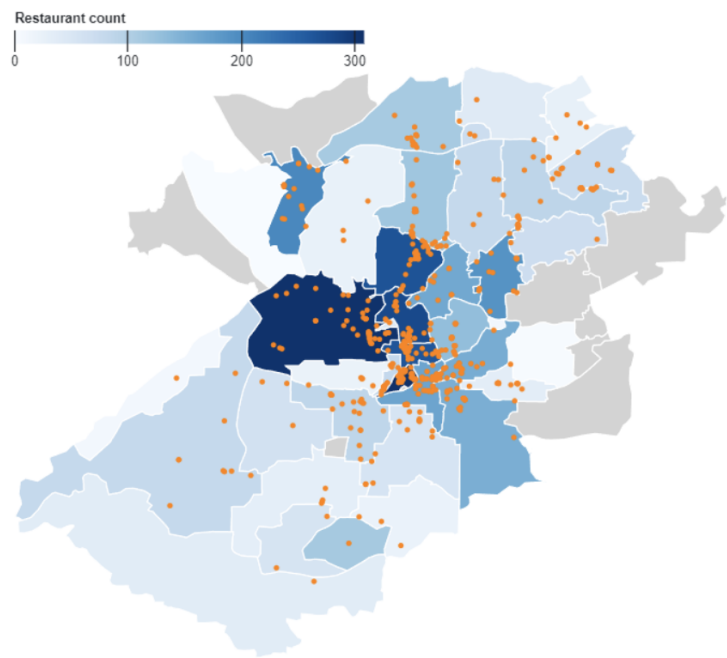| city	count
Portland	5737
Austin	4965
Atlanta	4180
Orlando	3749
Boston	2846

Figure 7: Top 5 cities with restaurant count

Figure 8: Restaurant count choropleth Atlanta map plotted with restaurants that have stars over 4.5
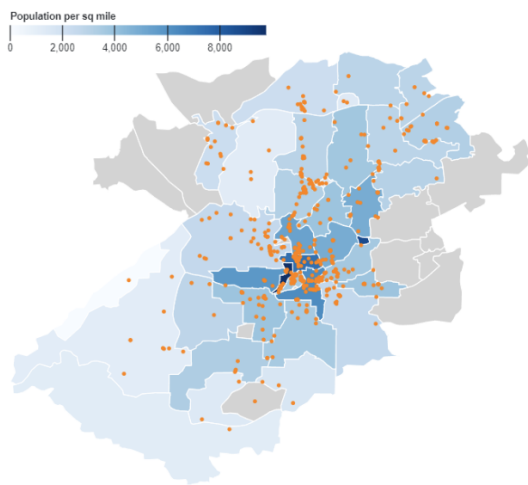
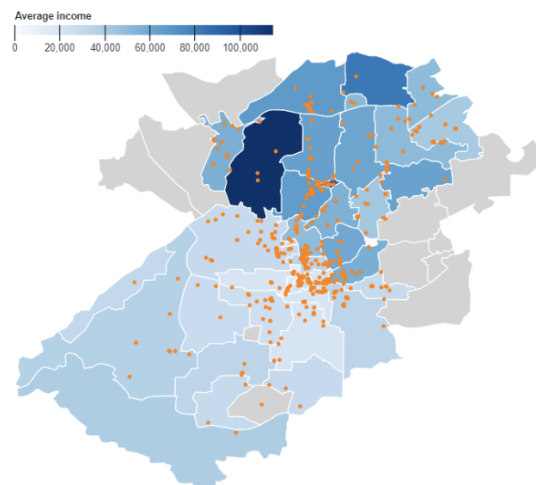**Figure 9:** Choropleth Atlanta map with respect to population density

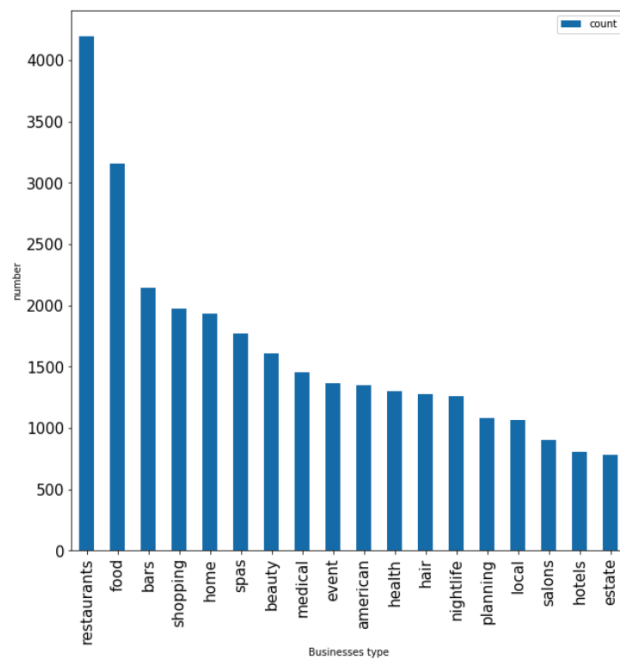**Figure 10:** Choropleth Atlanta map with respect to average income

of the businesses are restaurant related.

Figure 11: Top eighteen Atlanta businesses categories

	name	review_count	stars	categories
0	Mary Mac's Tea Room	3861	4.0	Venues & Event Spaces, Event Planning & Services, Comfort Food, Southern, Restaurants, Nightlife, Tea Rooms, Food, Bars
1	Fox Bros. Bar-B-Q	3825	4.5	Southern, Restaurants, Barbeque, American (Traditional)
2	Atlanta Breakfast Club	3761	4.5	Restaurants, Breakfast & Brunch, American (Traditional), Southern, Coffee & Tea, American (New), Food
3	Poor Calvin's	3379	4.5	Southern, Nightlife, Thai, Food, American (New), Ethnic Food, Restaurants, Beer, Wine & Spirits, Asian Fusion, Bars, Comfort Food, Specialty Food, Seafood
4	Antico Pizza	3135	4.0	Italian, Pizza, Restaurants
5	Two Urban Licks	2730	4.0	Bars, American (New), Nightlife, Southern, Restaurants
6	South City Kitchen Midtown	2618	4.5	Restaurants, American (New), Southern, Breakfast & Brunch, Gluten-Free
7	Fat Matt's Rib Shack	2165	4.0	Restaurants, Barbeque, Fast Food, Nightlife, Southern, Beer Bar, Bars, American (Traditional)
8	FLIP burger boutique	1909	4.0	Burgers, Specialty Food, Restaurants, Barbeque, Food, Nightlife, Bars, American (New)
9	Canoe	1844	4.5	Seafood, Restaurants, Breakfast & Brunch, American (New)

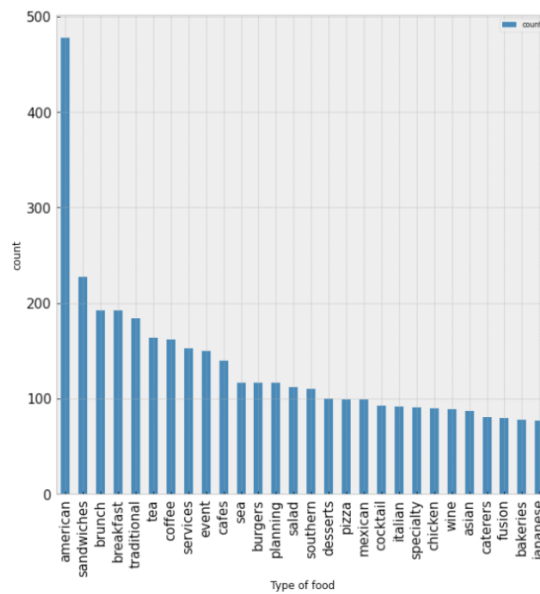**Figure 12:** Most popular highly rated restaurants in Atalanta(>4.0 stars)

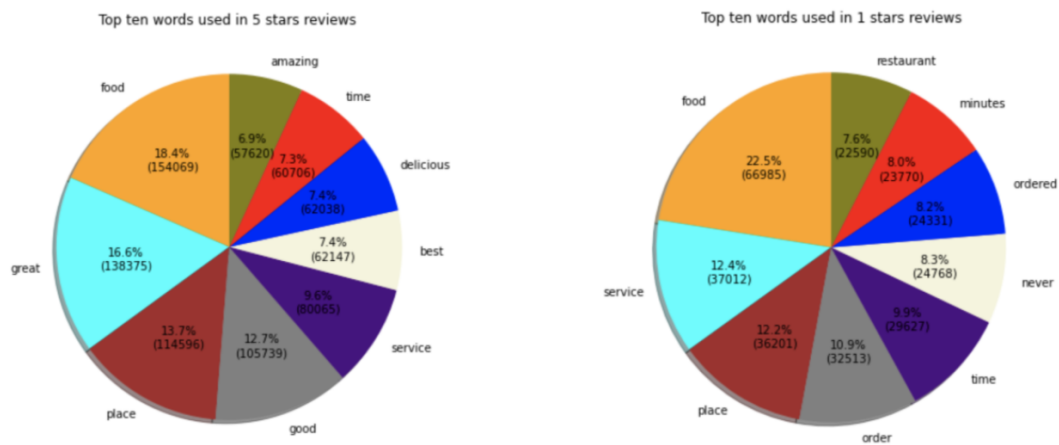**Figure 13:** Atlanta food type rank among highly rated(>4.0 stars) restaurants

Figure 14: Most common words used in 5stars and 1star reviewer ratings for Atlanta restaurants

```
+-----+--------------------+
|stars|                text|
+-----+--------------------+
|  4.0|Apparently Prides...|
|  4.0|This store is pre...|
|  5.0|I called WVM on t...|
|  2.0|I've stayed at ma...|
|  4.0|The food is alway...|
+-----+--------------------+
only showing top 5 rows
```

Figure 15: Dataset Example

```
+-----+-------+          +-----+-------+----+--------+
|stars|  count|          |stars|std_dev|skew|kurtosis|
+-----+-------+          +-----+-------+----+--------+
|  1.0|1262800|          |  1.0| 711.22|2.41|    7.85|
|  2.0| 711378|          |  2.0|  648.4|2.25|    7.44|
|  3.0| 926656|          |  3.0| 589.97|2.29|    8.19|
|  4.0|1920037|          |  4.0| 533.98|2.44|    9.64|
|  5.0|3814532|          |  5.0| 457.63|2.95|   14.25|
+-----+-------+          +-----+-------+----+--------+
```

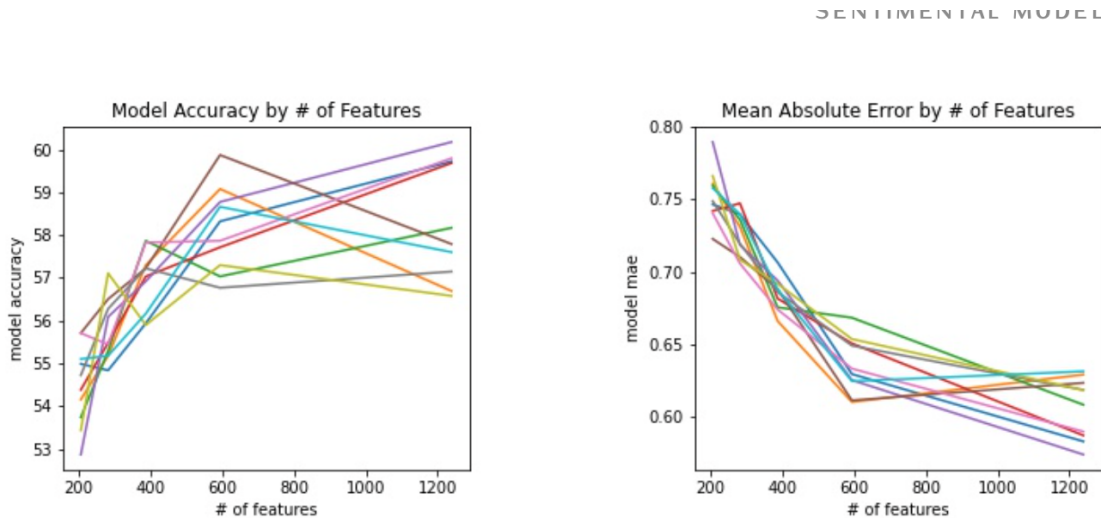**Figure 16:** Left: Review Count by Each Star; Right: Review Stats by Each Star

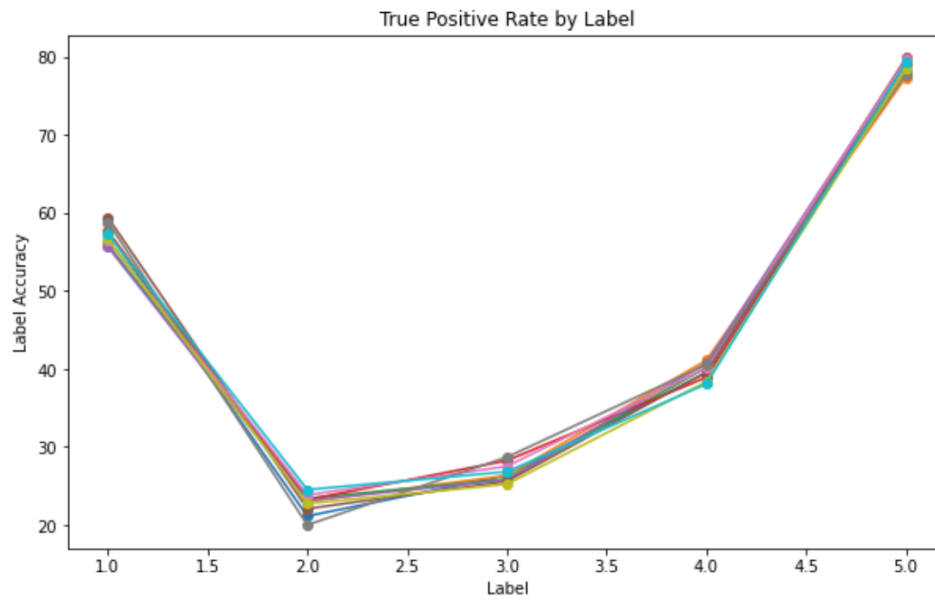**Figure 17:** Model Accuracy and Model Mean Absolute Error by Number of Features

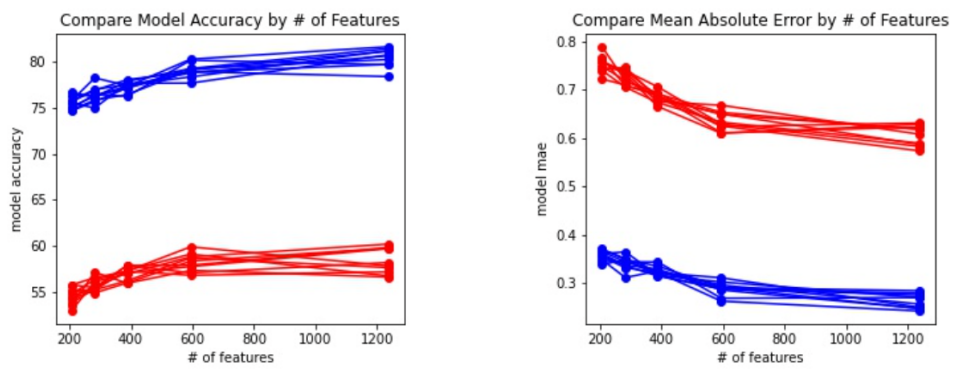**Figure 18:** True Positive Rate by Each Label

Figure 19: Regrouping 1 and 2-star, 4 and 5-star; Left: Model Accuracy, Right: Model MAE; (blue line: regrouping, red line: without regrouping
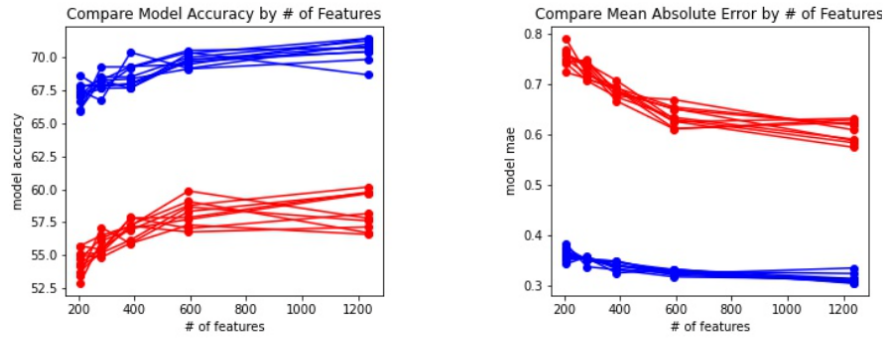
Figure 20: Regrouping 2, 3, and 4-star; Left: Model Accuracy, Right: Model MAE; (blue line: regrouping, red line: without regrouping
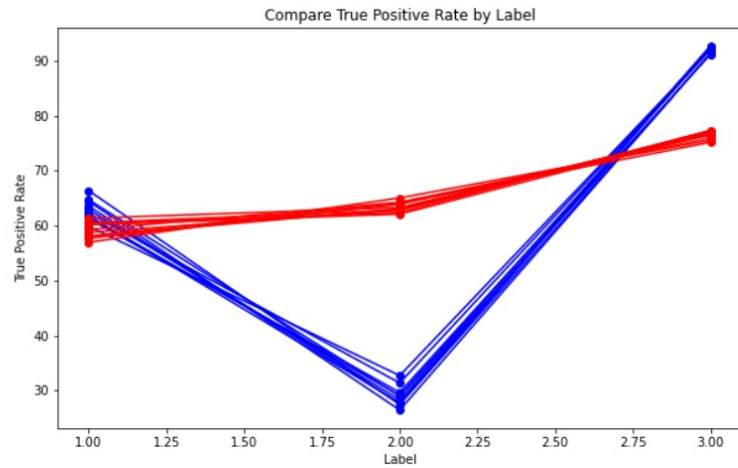

Figure 21: Blue Line: Regrouping 1 and 2-star, 4 and 5-star; Red Line: Regrouping 2, 3, and 4-star