Where to Open the Next Fast Food Restaurant

Thomas Gresco, Andrew Li, Euribiades Mota, and Vineetha Ramachandra

Essential Questions:

- How does the population relate to the total number of fast food restaurants in a given state?
- How does the population percent change relate to the total restaurants
- How does the average household income compare to the total population and restaurants?
- What is the best location in our specified state to open a restaurant?

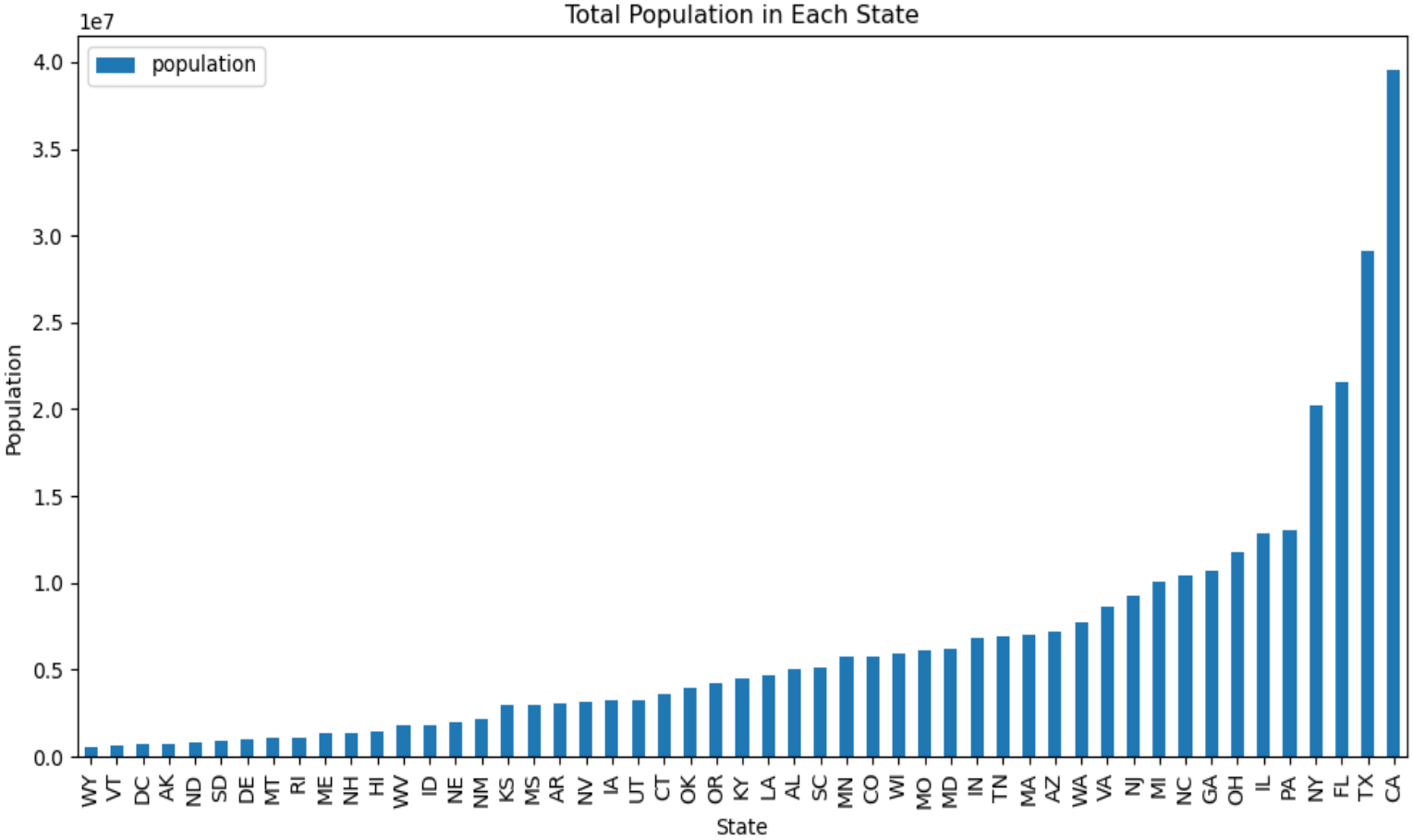
Motivation:

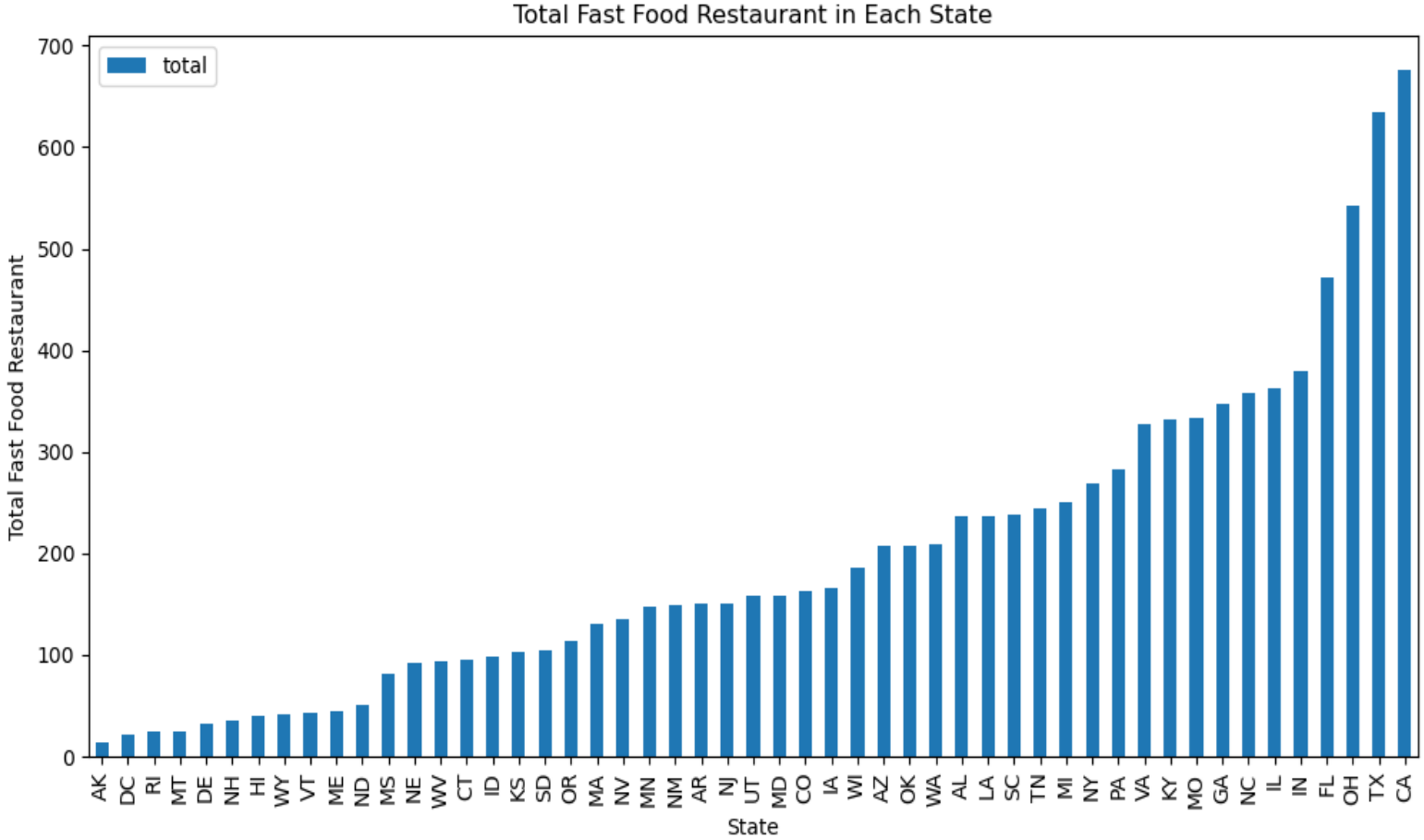
1. Interest in Owning a Business/Franchise or helping others who have this desire

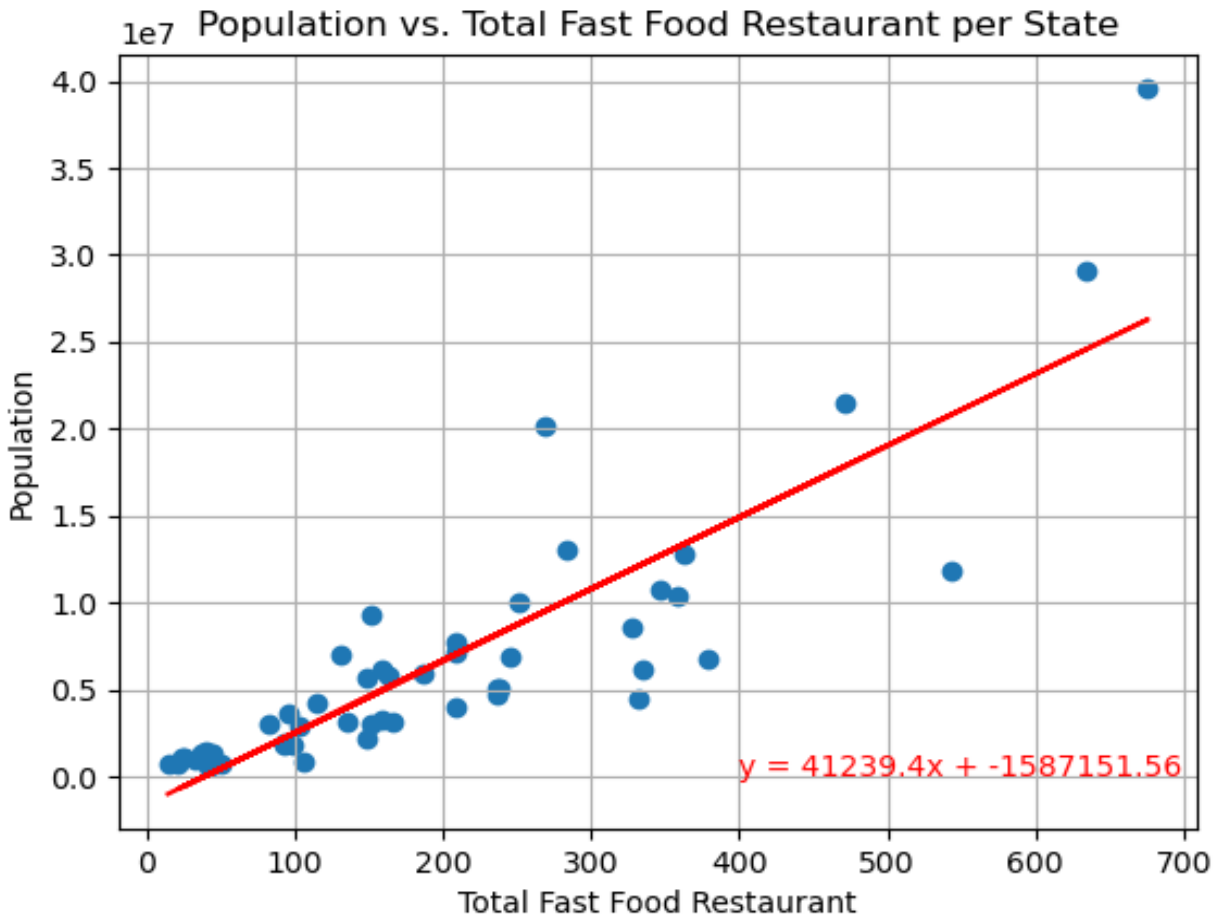
2. An interest in the profitability of the fast food industry and fast food companies themselves

01

Population vs Number of Fast Food Restaurants


Total Population in Each State
1e7
population
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Population
WY VT DC AK ND SD DE MT RI ME NH HI WV ID NE NM KS MS AR NV IA UT CT OK OR KY LA AL SC MN CO WI MO MD IN TN MA AZ WA VA NJ MI NC GA OH IL PA NY FL TX CA
State


Total Fast Food Restaurant in Each State
total
Total Fast Food Restaurant
0
100
200
300
400
500
600
700
AK
DC
RI
MT
DE
NH
HI
WY
VT
ME
ND
MS
NE
WV
CT
ID
KS
SD
OR
MA
NV
MN
NM
AR
NJ
UT
MD
CO
IA
WI
AZ
OK
WA
AL
LA
SC
TN
MI
NY
PA
VA
KY
MO
GA
NC
IL
IN
FL
OH
TX
CA
State

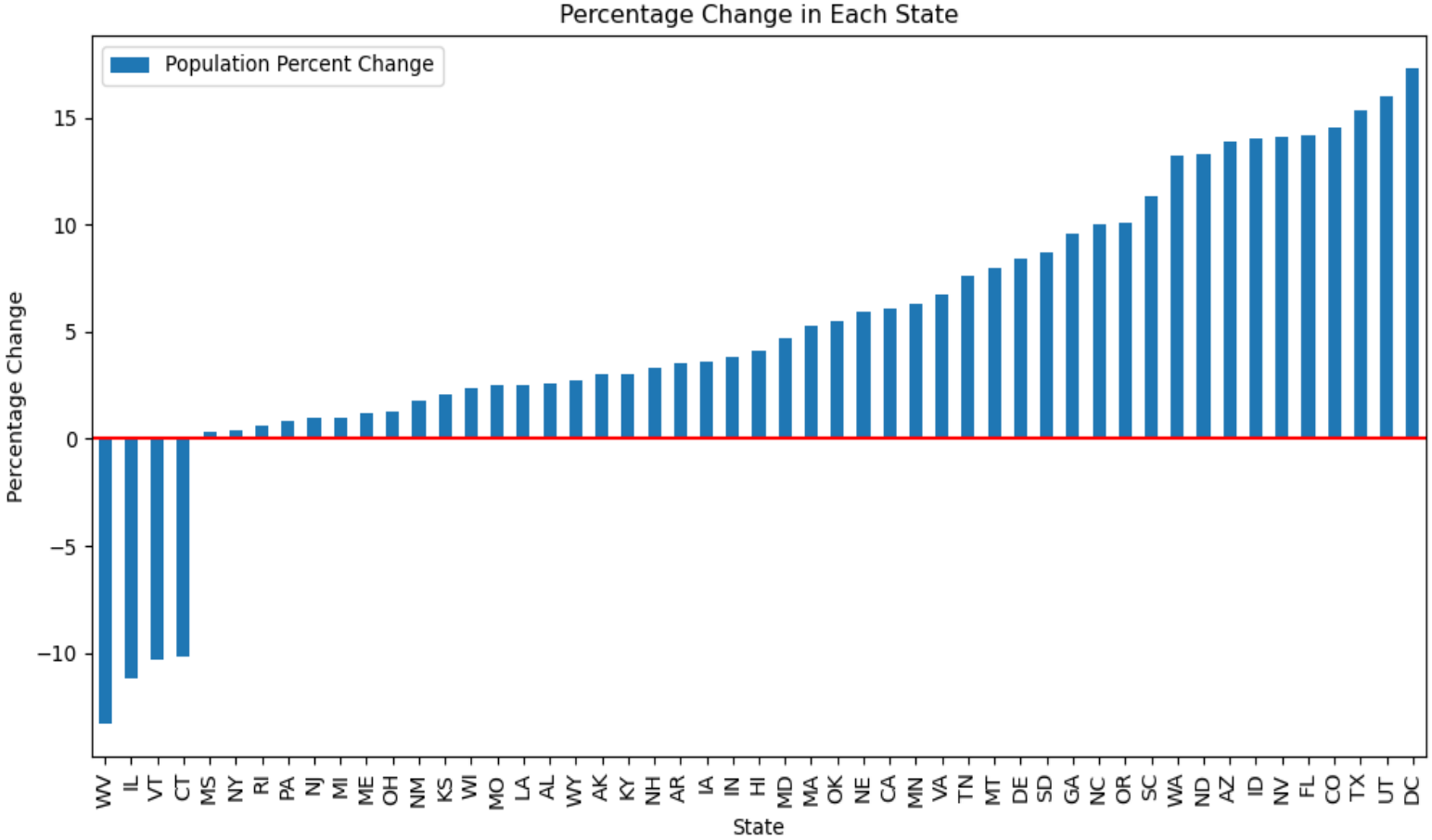

Population vs. Total Fast Food Restaurant per State
1e7
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Population
0
100
200
300
400
500
600
700
Total Fast Food Restaurant
y = 41239.4x + -1587151.56

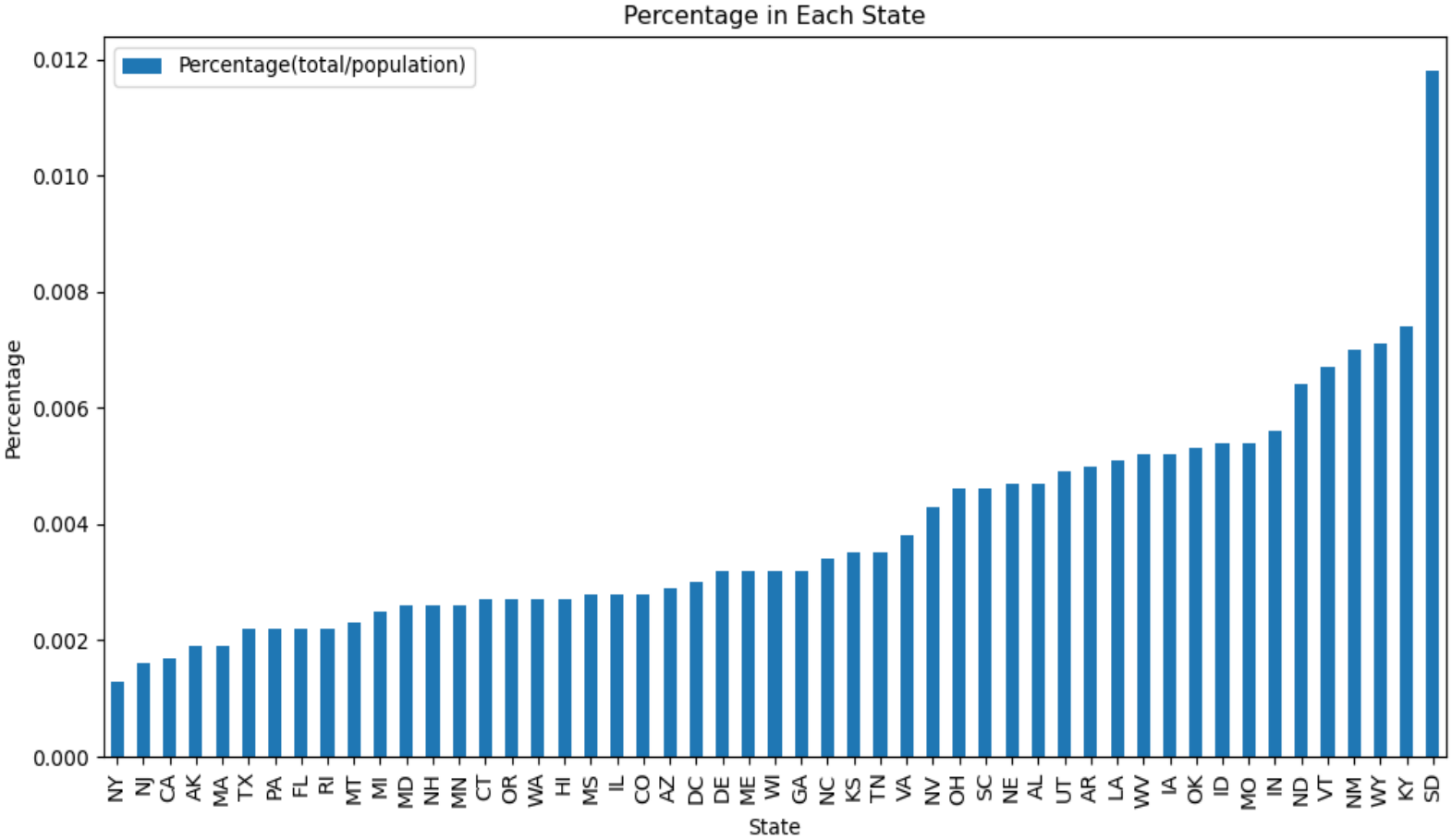
Analysis:

- The “r” value is 0.86 which represents a strong positive correlation
- From the bar graphs it is evident that as the population increases, so does the total number of fast food restaurants in most cases.
- This is further supported by the scatter plot that shows the total number of restaurants is increasing with the total population.

02

How does the population percent change relate to the total restaurants


Percentage Change in Each State
Population Percent Change
Percentage Change
15
10
5
0
−5
−10
WV IL VT CT MS NY RI PA NJ MI ME OH NM KS WI MO LA AL WY AK KY NH AR IA IN HI MD MA OK NE CA MN VA TN MT DE SD GA NC OR SC WA ND AZ ID NV FL CO TX UT DC
State

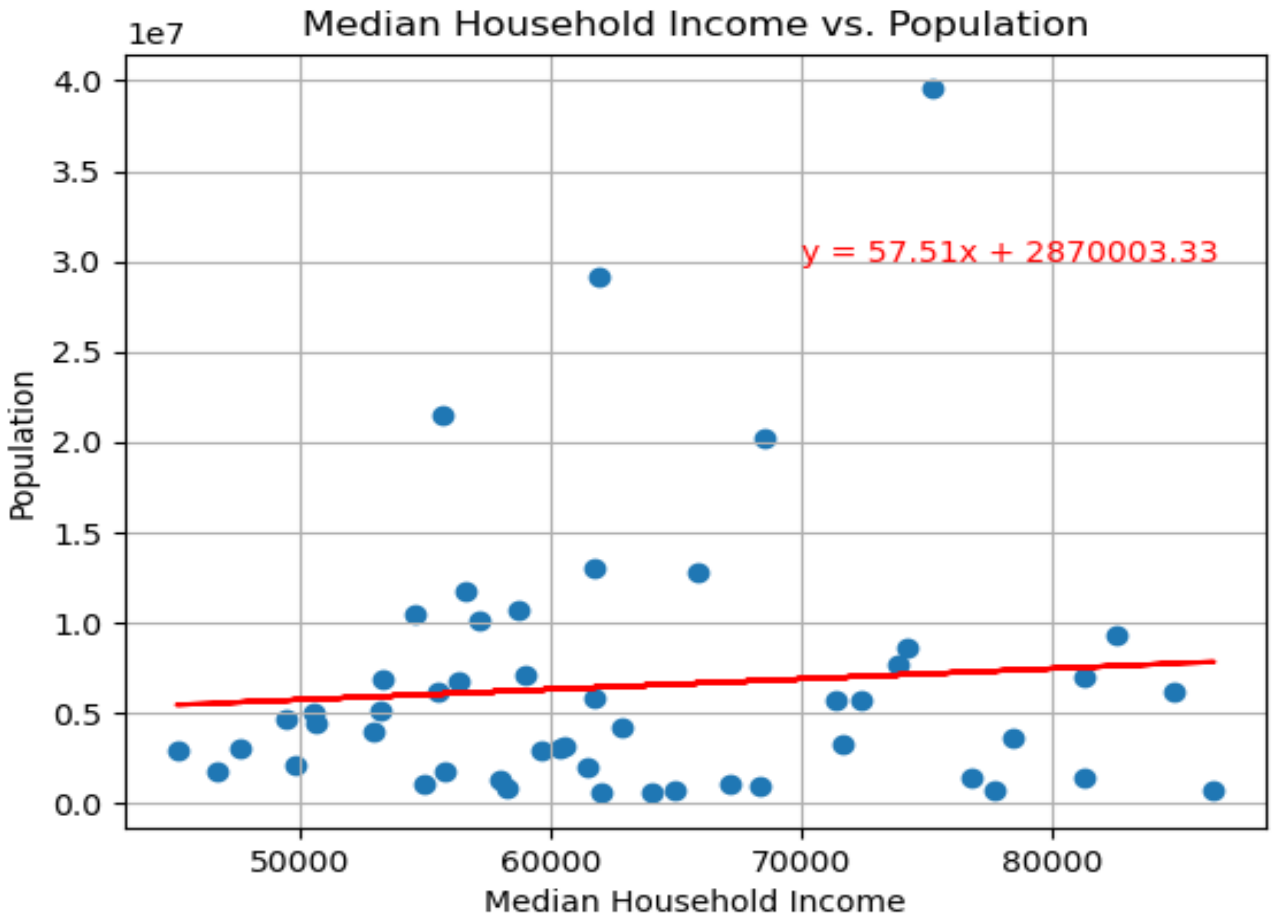

Percentage in Each State
Percentage(total/population)
Percentage
0.012
0.010
0.008
0.006
0.004
0.002
0.000
NY NJ CA AK MA TX PA FL RI MT MI MD NH MN CT OR WA HI MS IL CO AZ DC DE ME WI GA NC KS TN VA NV OH SC NE AL UT AR LA WV IA OK ID MO IN ND VT NM WY KY SD
State

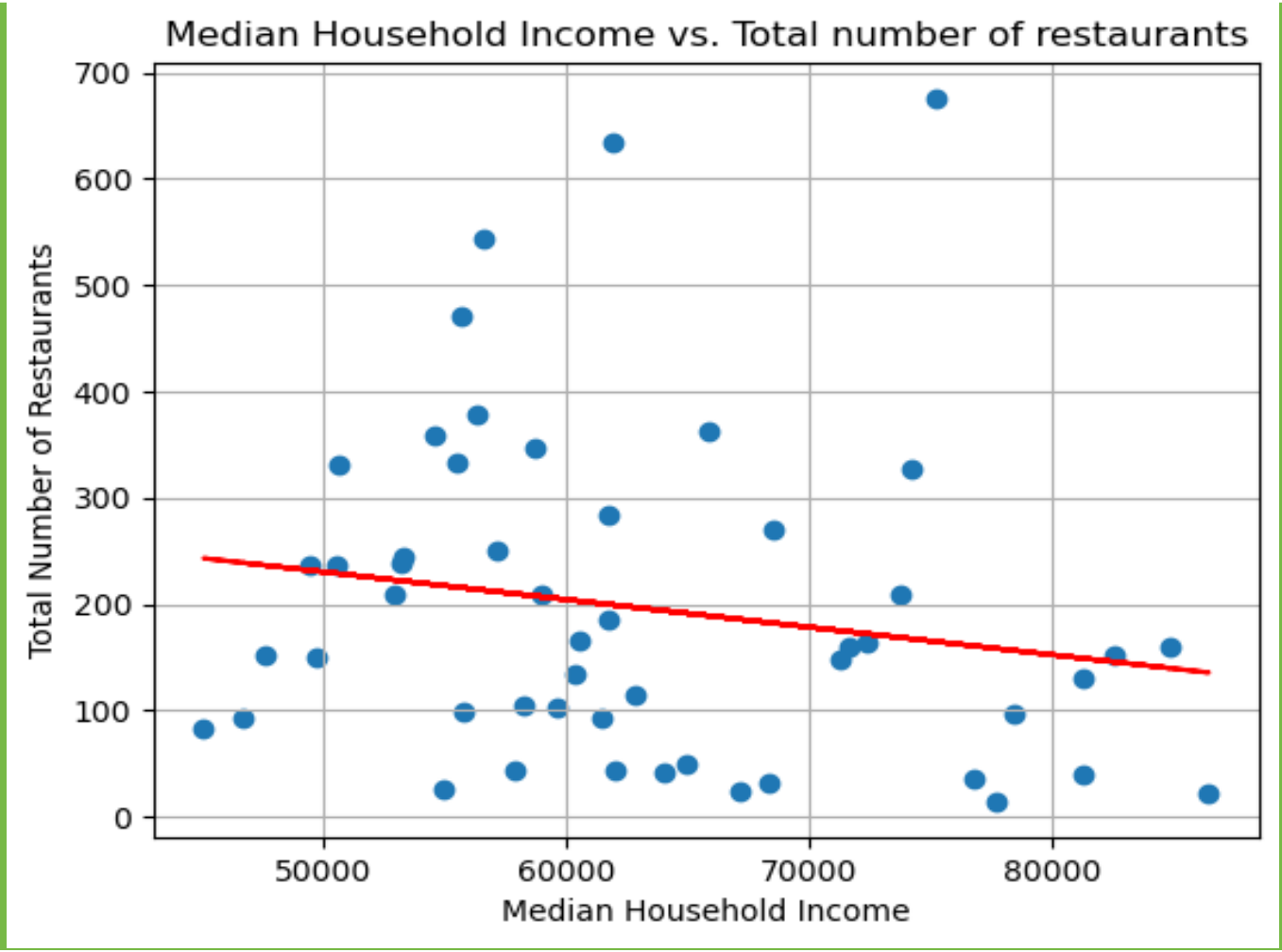
Analysis:

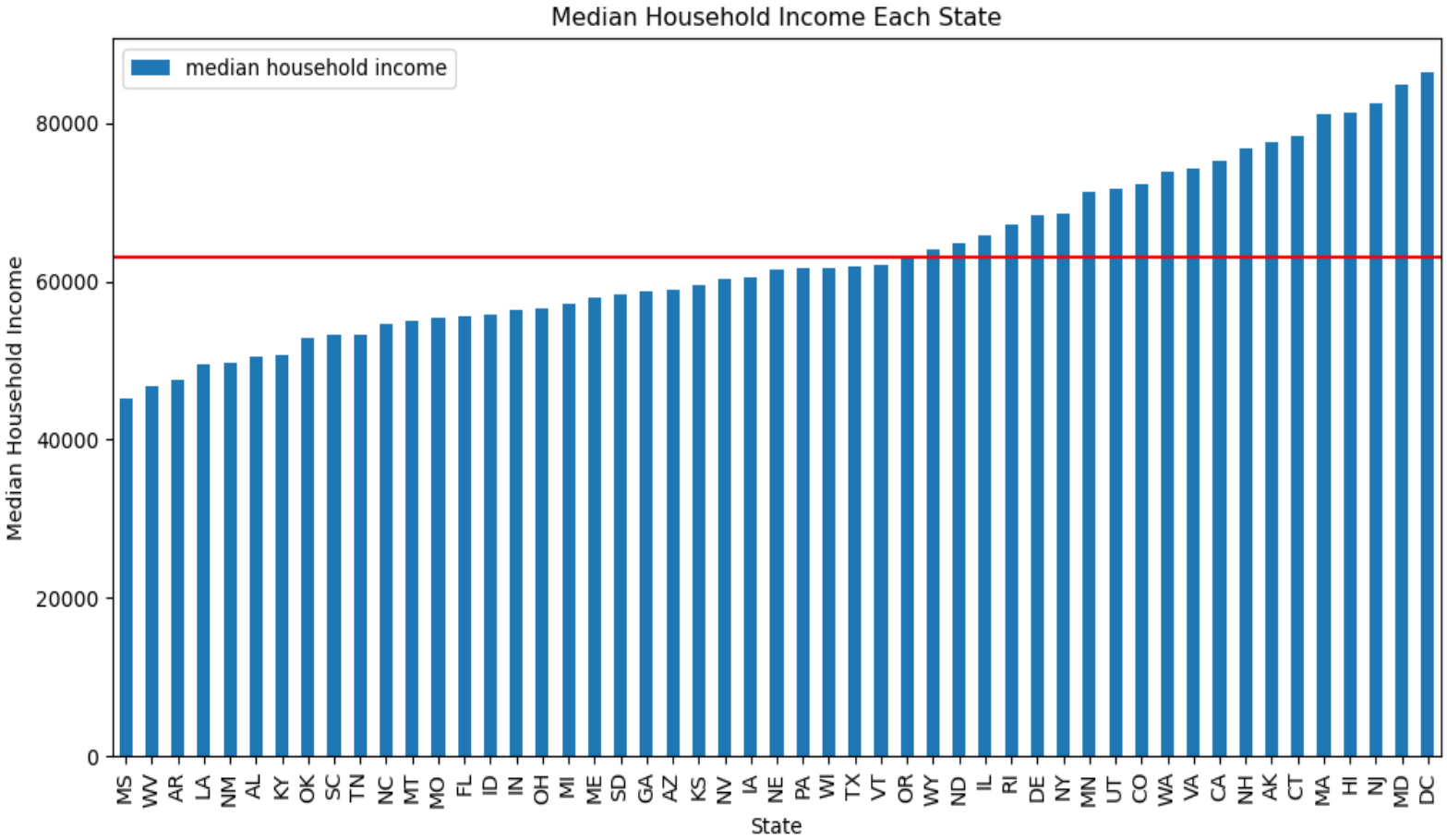
- From the second bar graph it is evident that states with a smaller population had a higher ratio of restaurants to the total population.
- South Dakota ranks in the bottom five states in terms of total population (excluding Washington D.C.) but has the highest ratio shown in the second bar graph.
- As the population changes, the number of fast food restaurants fluctuates alongside it. When the population decreases the number of fast food restaurants declines and vice versa.

03

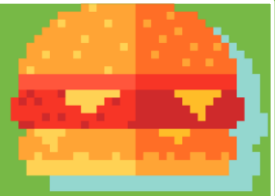
How does the average household income compare to the total population and restaurants?


Median Household Income vs. Population
1e7
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Population
y = 57.51x + 2870003.33
50000
60000
70000
80000
Median Household Income


Median Household Income vs. Total number of restaurants
Total Number of Restaurants
Median Household Income
0
100
200
300
400
500
600
700
50000
60000
70000
80000


Median Household Income Each State
median household income
Median Household Income
0
20000
40000
60000
80000
MS
WV
AR
LA
NM
AL
KY
OK
SC
TN
NC
MT
MO
FL
ID
IN
OH
MI
ME
SD
GA
AZ
KS
NV
IA
NE
PA
WI
TX
VT
OR
WY
ND
IL
RI
DE
NY
MN
UT
CO
WA
VA
CA
NH
AK
CT
MA
HI
NJ
MD
DC
State

Analysis:

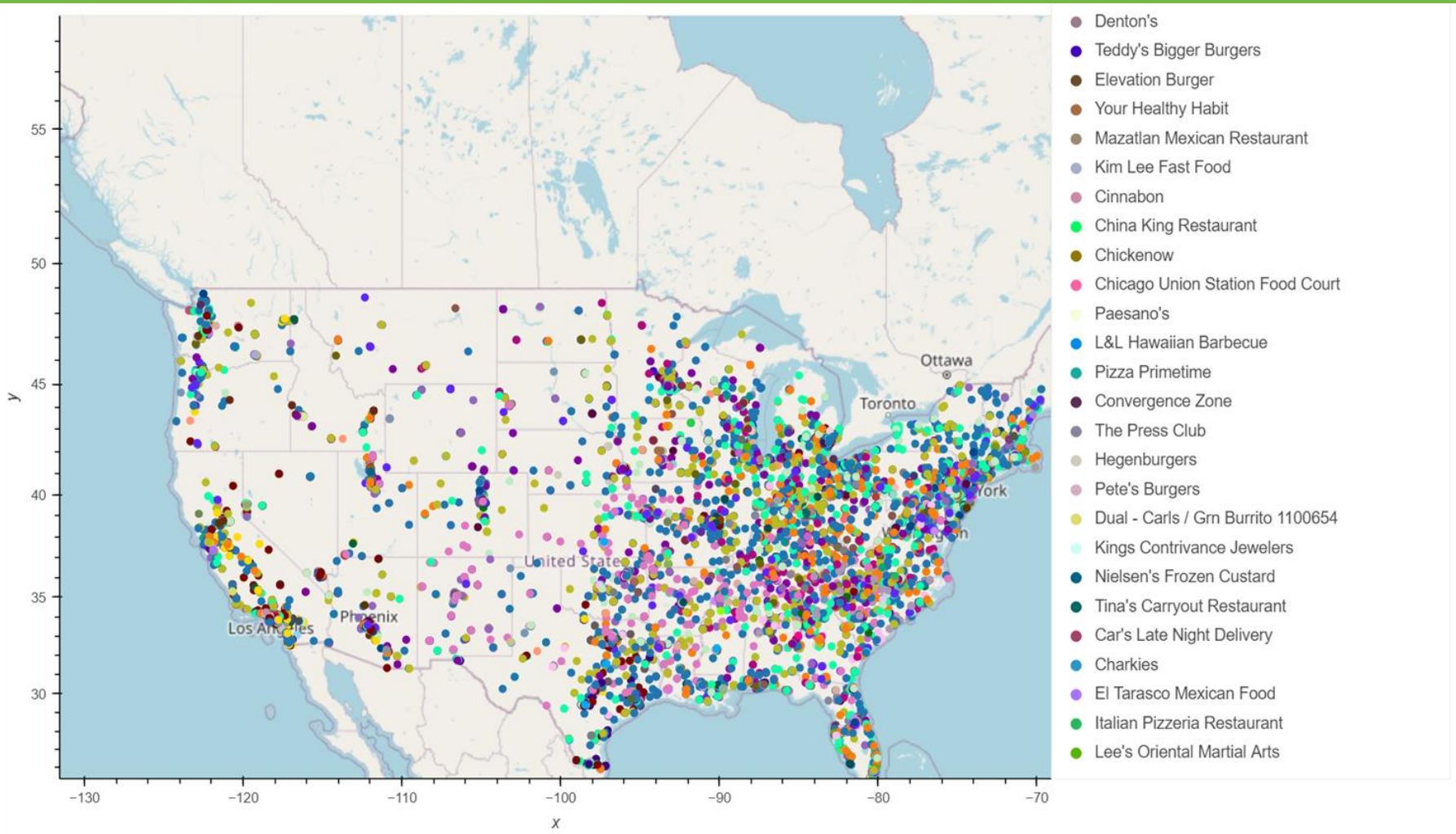


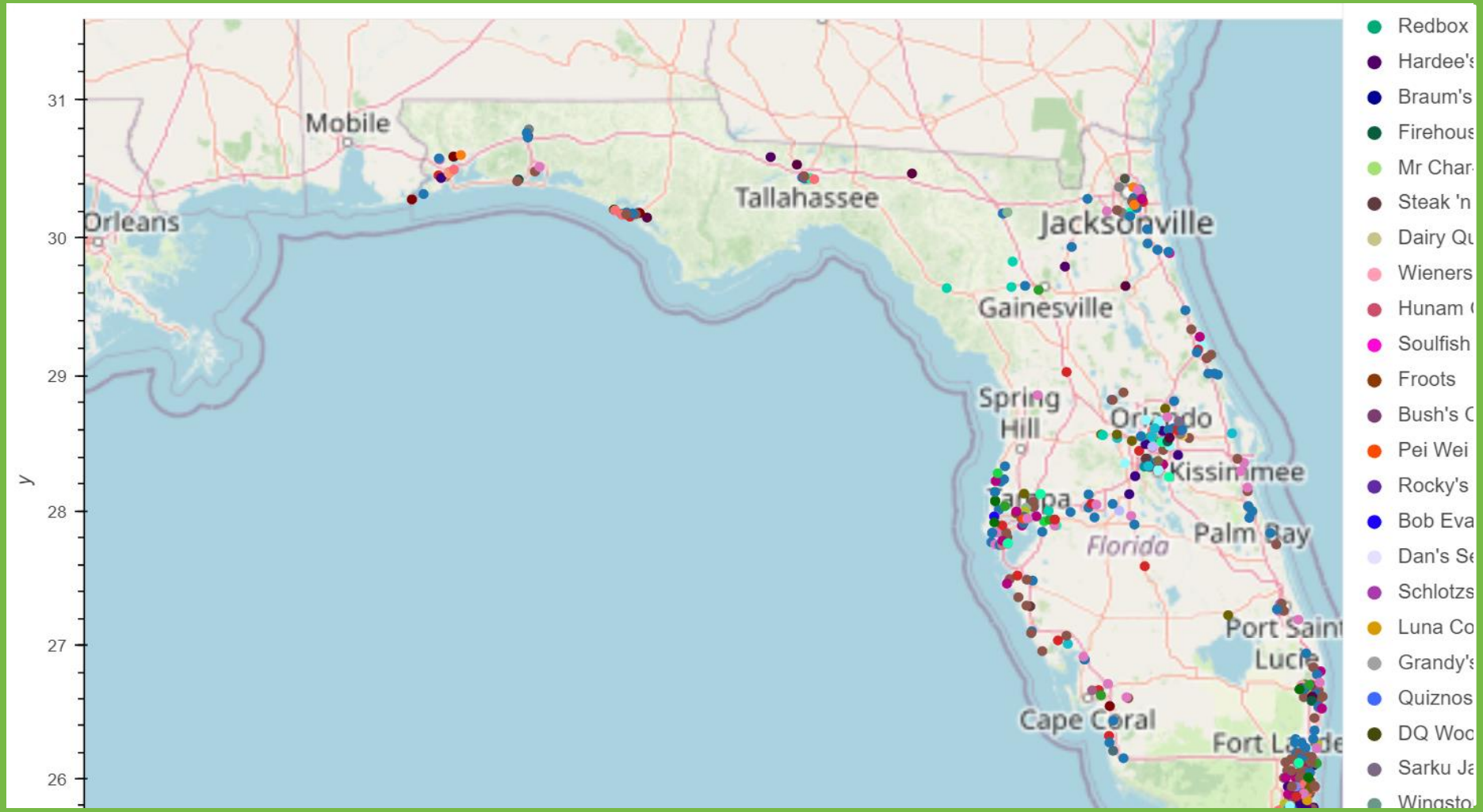
- The median household income was about $63,000
- From Wyoming to the right are states above the median. This helps us gauge which states have higher poverty rates.
- Based on the scatter plot that shows median household income vs population, there is a very weak positive correlation between the two.
- The “r-value” is 0.08 which is very close to zero and represents what is being shown on the graph as the regression line looks almost straight.
- As income increases the total number of restaurants decreases

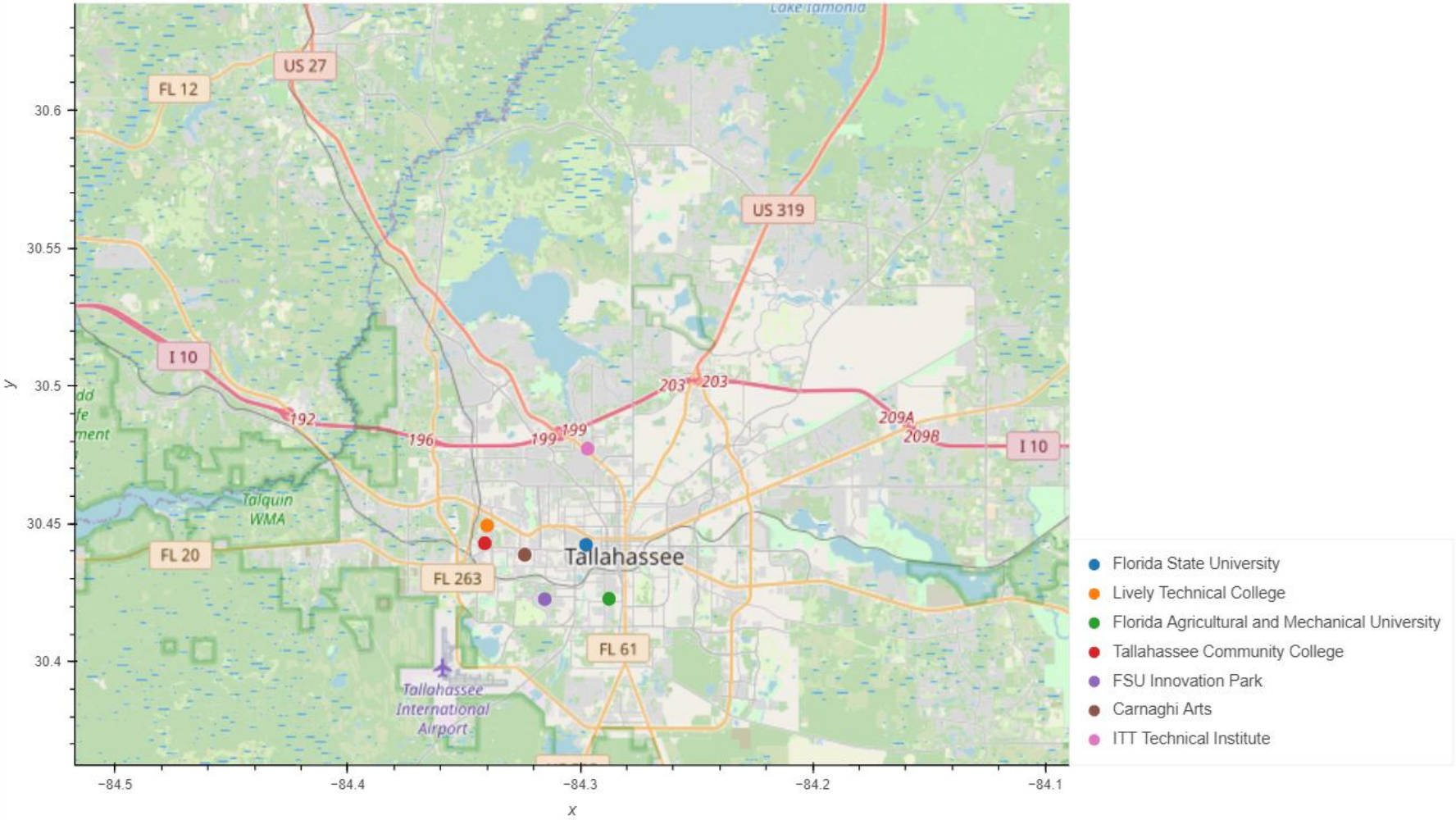
04

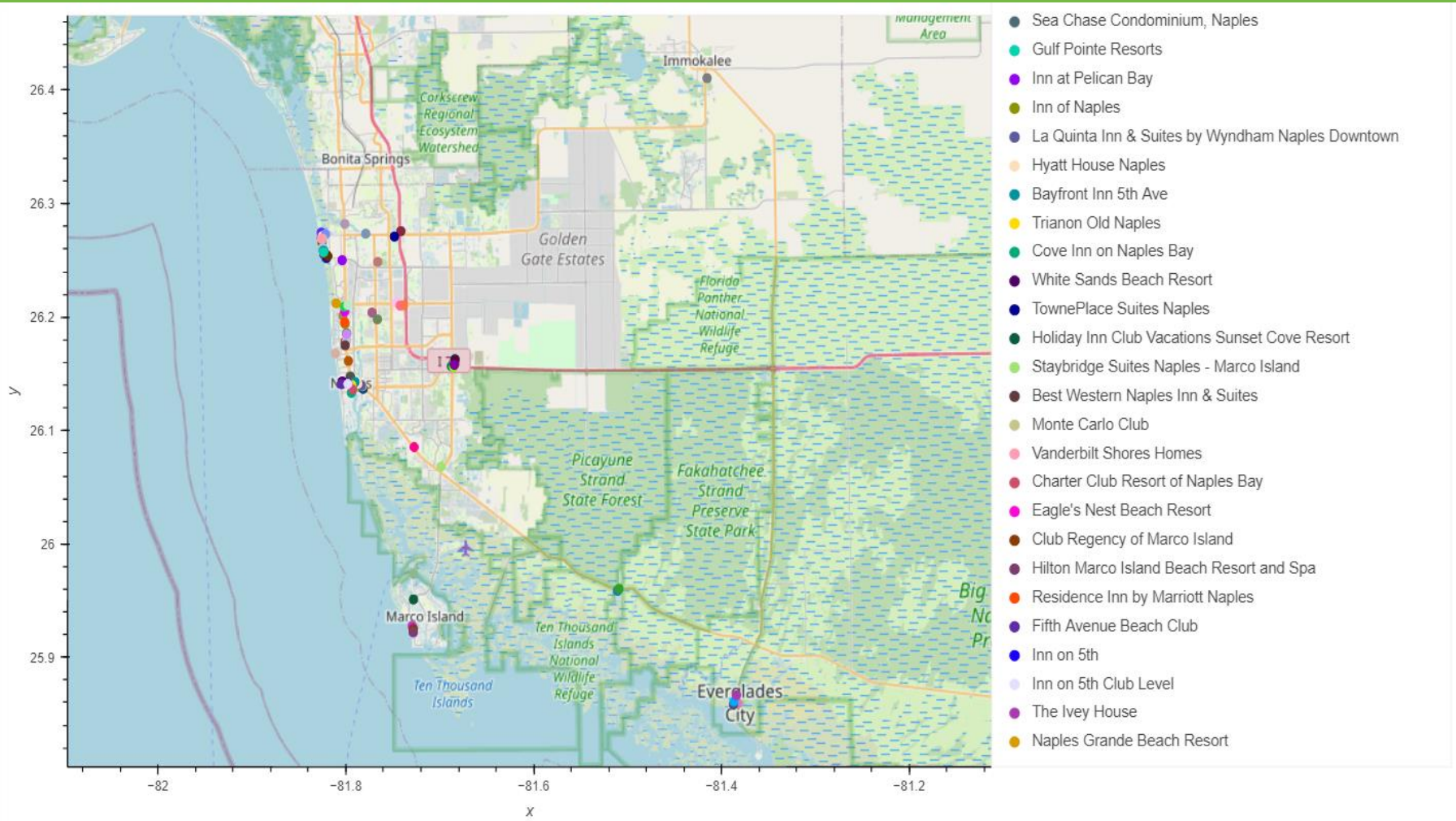
Where is the best location in the state to open?



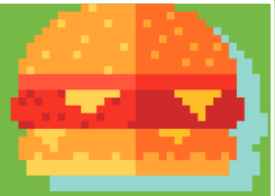


Denton's
Teddy's Bigger Burgers
Elevation Burger
Your Healthy Habit
Mazatlan Mexican Restaurant
Kim Lee Fast Food
Cinnabon
China King Restaurant
Chickenow
Chicago Union Station Food Court
Paesano's
L&L Hawaiian Barbecue
Pizza Primetime
Convergence Zone
The Press Club
Hegenburgers
Pete's Burgers
Dual - Carls / Grn Burrito 1100654
Kings Contrivance Jewelers
Nielsen's Frozen Custard
Tina's Carryout Restaurant
Car's Late Night Delivery
Charkies
El Tarasco Mexican Food
Italian Pizzeria Restaurant
Lee's Oriental Martial Arts
Ottawa
Toronto
United States
Phoenix
55
50
45
40
35
30
y
−130
−120
−110
−100
−90
−80
−70
x


Mobile
Tallahassee
Orleans
Jacksonville
Gainesville
Spring Hill
Kissimmee
Florida
Palm Bay
Cape Coral
Port Saint Lucie
Redbox
Hardee's
Braum's
Firehous
Mr Char
Steak 'n
Dairy Qu
Wieners
Hunam
Soulfish
Froots
Bush's
Pei Wei
Rocky's
Bob Eva
Dan's Se
Schlotzs
Luna Co
Grandy's
Quiznos
DQ Woo
Sarku Ja
Wingsto
y
31
30
29
28
27
26


Lake Iamonia
US 27
FL 12
US 319
I 10
I 10
FL 20
FL 263
FL 61
Tallahassee
Talquin WMA
Tallahassee International Airport
192
196
199
199
203
203
209A
209B
30.6
30.55
30.5
30.45
30.4
y
−84.5
−84.4
−84.3
−84.2
−84.1
x
Florida State University
Lively Technical College
Florida Agricultural and Mechanical University
Tallahassee Community College
FSU Innovation Park
Carnaghi Arts
ITT Technical Institute

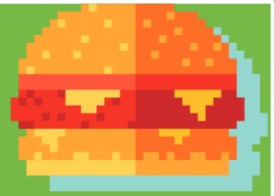

Immokalee
Bonita Springs
Golden Gate Estates
Florida Panther National Wildlife Refuge
Picayune Strand State Forest
Fakahatchee Strand Preserve State Park
Marco Island
Ten Thousand Islands National Wildlife Refuge
Ten Thousand Islands
Everglades City
Corkscrew Regional Ecosystem Watershed
26.4
26.3
26.2
26.1
26
25.9
y
−82
−81.8
−81.6
−81.4
−81.2
x
Sea Chase Condominium, Naples
Gulf Pointe Resorts
Inn at Pelican Bay
Inn of Naples
La Quinta Inn & Suites by Wyndham Naples Downtown
Hyatt House Naples
Bayfront Inn 5th Ave
Trianon Old Naples
Cove Inn on Naples Bay
White Sands Beach Resort
TownePlace Suites Naples
Holiday Inn Club Vacations Sunset Cove Resort
Staybridge Suites Naples - Marco Island
Best Western Naples Inn & Suites
Monte Carlo Club
Vanderbilt Shores Homes
Charter Club Resort of Naples Bay
Eagle's Nest Beach Resort
Club Regency of Marco Island
Hilton Marco Island Beach Resort and Spa
Residence Inn by Marriott Naples
Fifth Avenue Beach Club
Inn on 5th
Inn on 5th Club Level
The Ivey House
Naples Grande Beach Resort

Conclusions:



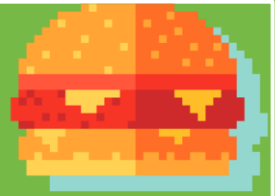
- We chose Florida as the best location to open our next fast food restaurant
- Based off the data, although Florida is in the top 5 in total population and number of fast food restaurants, the ratio of restaurants to people is very small and population continues to increase in Florida
- We found that as the median household income increased, there were less fast food restaurants.
- Despite being on the lower end of median household income, Florida had many areas that did not have an abundance of fast food restaurants.

Conclusions:



- Two areas in Florida that we deemed suitable to open a new fast food restaurant are in Tallahassee and near Naples.
- Tallahassee is home to Florida State University. According to Jacqueline Howard of CNN, people aged 20-39 eat more fast food than any other age group. Although, this is a large age spread, college students fit directly in to this.
- The final map shows hotels around Naples. There are an abundance of hotels as it is a big vacation spot, but if you look at the map of Florida there are not many fast food restaurants.

Implications:

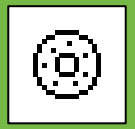


- It is evident that there are an abundance of fast food restaurants in the United States, but there are still plenty of locations to add more.
- These findings can be used to look in to other specific states outside of Florida.
- For future research, we can do more research on specific fast food restaurant's yearly revenue and revenue changes.
- Other points of new research could include demographics from specific states, such as ethnicity and race. These could factor in to the success of a fast food restaurant.

Where the data was found:

Fast Food Data:

- The data was found on “Kaggle”
- This is a list of over 10,000 restaurants
- Includes the name, address, latitude and longitude of each place



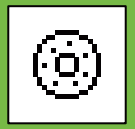
Demographics Data:

- This data was found using the “CORGIS Dataset Project”
- This data was provided by Ryan Whitcomb, Joung Min Choi, Bo Guan
- Includes many different demographics for each state, such as income, population, and age.

How the data was found:

Fast Food Data:

- Google Search
- Looked through multiple websites to see where the best and most reliable csv file could be found



Demographics Data:

- Google Search
- Went through Census Data
- Looked through multiple csv files to find one that included all aspects that would help us answer our essential questions