Project Report
Business Survey (ABS) Census API

Group: The People
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Introduction:

Have you ever wondered about business analytics? This report looks at the data from the Annual Business Survey (ABS), and explores topics such as the number of employees per industry, education of business owners and veteran owned businesses.

Data Sources:

"Company Summary. Provides data for employer businesses by sector, sex, ethnicity, race, veteran status, years in business, receipts size of firm, and employment size of firm for the U.S., states, and metro areas. Data for counties and economic places are available for 2018, and urban and rural classification of firms are available for 2021."(Bureau, 2022)

"Characteristics of Businesses. Provides data for respondent employer firms by sector, sex, ethnicity, race, veteran status, years in business, receipts size of firm, and employment size of firm for the U.S., states, and metro areas, including detailed business characteristics. Data for counties and economic places are available for 2018, and urban and rural classification of firms are available for 2021."(Bureau, 2022)

"Characteristics of Business Owners. Provides data for owners of respondent employer firms by sector, sex, ethnicity, race, and veteran status for the U.S., states, and metro areas, including detailed owner characteristics. Data for counties and economic places are available for 2018."(Bureau, 2022)

Citations:

Bureau, U. S. C. (2022, October 26). *ABS API*. Census.gov. Retrieved April 23, 2023, from https://www.census.gov/programs-surveys/abs/technical-documentation/api.2019.html#list-tab-702748516

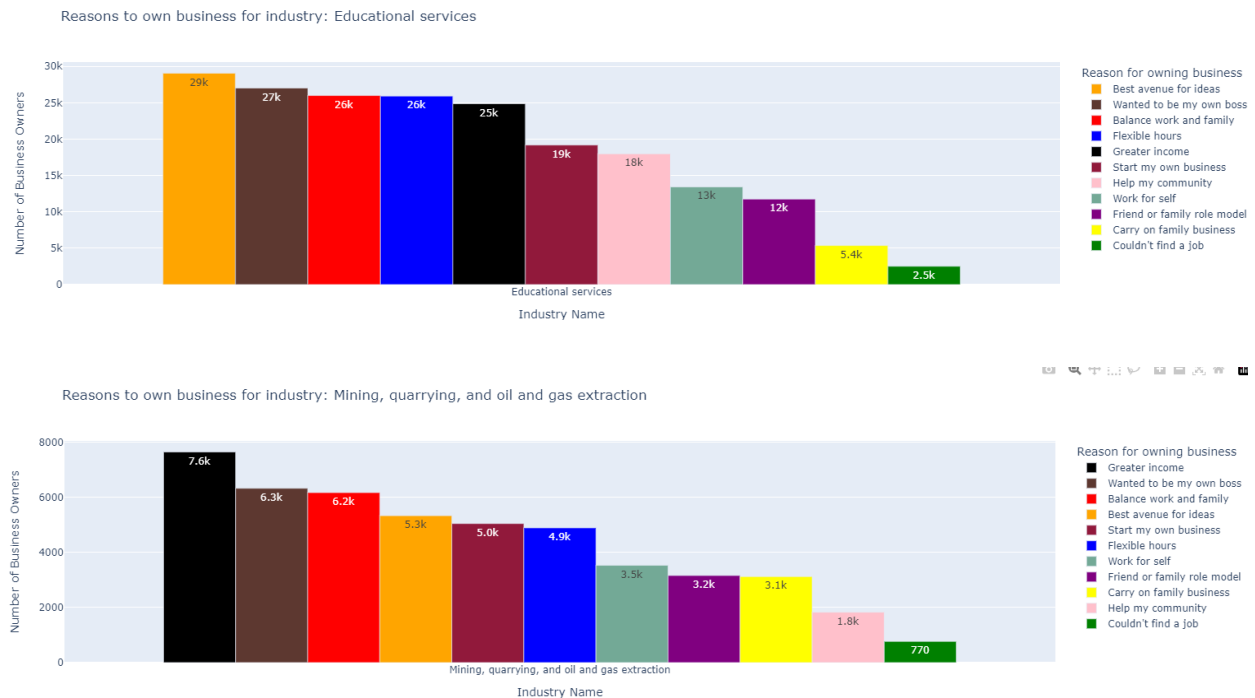Bureau, U. S. C. (2022, October 28). *Annual Business Survey (ABS) apis*. Census.gov. Retrieved April 23, 2023, from https://www.census.gov/data/developers/data-sets/abs.2019.html

Questions:

1. What motivates business owners to try to start their own business? Does this vary from industry?
   ○ Explanation Process:
      i. Look at Business Owners Characteristics API documentation
      ii. See that they have surveyed a list of reasons to own a business from business owners
      iii. Look up how to sort through different industries in the API documentation
      iv. Possibly filter out certain industries or reason labels that are duplicates or unnecessary
      v. Determine if data needs to be aggregated or use proportions to get accurate representations
      vi. Pick how to best visualize those reasons for each industry
2. What ages are most business owners and how has the average age of business owners changed over time? Increase? Decrease? Drastic changes?
   ○ Explanation Process:
      i. Look at Business Owners Characteristics API documentation
      ii. See that they surveyed ages via multiple age group categories
      iii. Must make an api call to each year's survey data and make sure year is included in the call to know which data set I'm looking at
      iv. Find a way to get total number of business numbers of each age group for the year
      v. Find a way to put the years together into one dataset
      vi. Plot the dataset as a time series or line plot
3. What education level do most business owners hold since starting a business can both take time away from academic career as well as be bolstered by higher levels of academia? Can educational priorities vary by state?
   ○ Explanation Process:
      i. Look at Business Owners Characteristics API documentation
      ii. See that they surveyed educational levels for business owners
      iii. Make api call to obtain the number of business owners for each educational level category
      iv. Find out how to make api call to get the same information but split up by state and educational level category
      v. Possibly aggregate data and remove educational level categories that are odd
      vi. Plot the dataset as bar charts to compare the information categorically
4. How many employees are in each industry?
   ○ Explanation Process:
      i. View the documentation to determine what variables need to be included in the API call in order to generate a visualization.
5. What is the average annual salary based on industry?
   ○ Explanation Process:

    i. Using the answer to question 4, calculate an average salary using the annual payroll and number of employees.

6. How has the number of employees changed over time?
   - Explanation Process:
     - i. View the documentation to determine what variables need to be included in the API call.
     - ii. Make four separate API calls to retrieve data for each year.
     - iii. Concat the data to ensure the generation of one master table.

7. What businesses are veteran owners interested in, and struggle with?
   - Explore technical documentation to determine variables to work with
   - Make two API calls for different parts of the survey
   - Create and filter dataframes for each visualization
   - Plot the data

Answers:

Question 1: Reasons Business Owners own a business

Reasons to own business for industry: Educational services

Reasons to own business for industry: Mining, quarrying, and oil and gas extraction

*I have more industries but don't want to put them all.

We can see different industries may choose different reasons to own their own business:
- We see that best avenue for ideas is 1st for educational services while its 4th for Mining industry

Reasons for owning a business for every industry

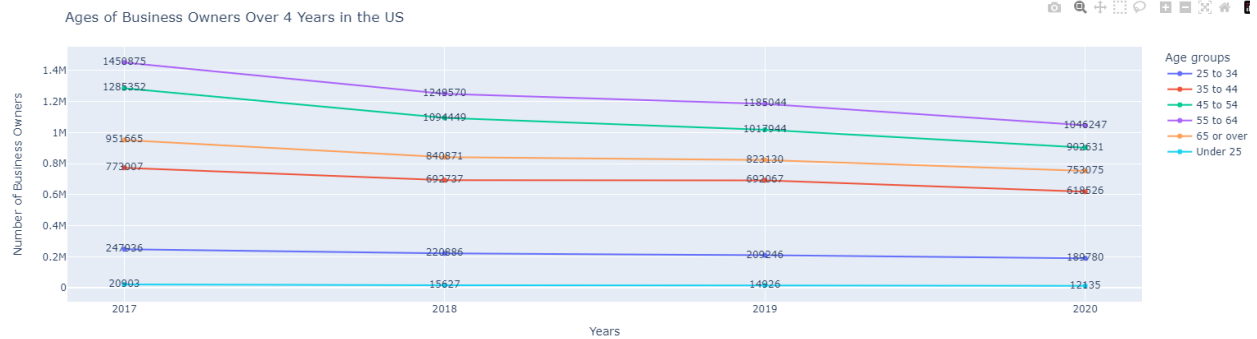Reasons for owning a business for every industry

- Seeing all industries' business owners and the proportion of their answers of why they own their own business, we can start to see which reasons are more important compared to others across all industries even if there are some variations/differences between some industries

Q1:According to these visuals we can determine:
- Number 1 reasons for choosing to own a business:
  - Wanted to be my own Boss, Greater Income, Balance work and Family, Best avenue for ideas, Flexible hours
- Reasons that did not factor very high for choosing to own a business:
  - Couldn't find a job, Carry on family business, Help my community, Work for self, Friend or family role model
- Although different industries may have different reasons for owning a business, they generally pick one of the top reasons in : [Wanted to be my own Boss, Greater Income, Balance work and Family, Best avenue for ideas, Flexible hours]

Question 2 : Age groups of business owners across 4 years
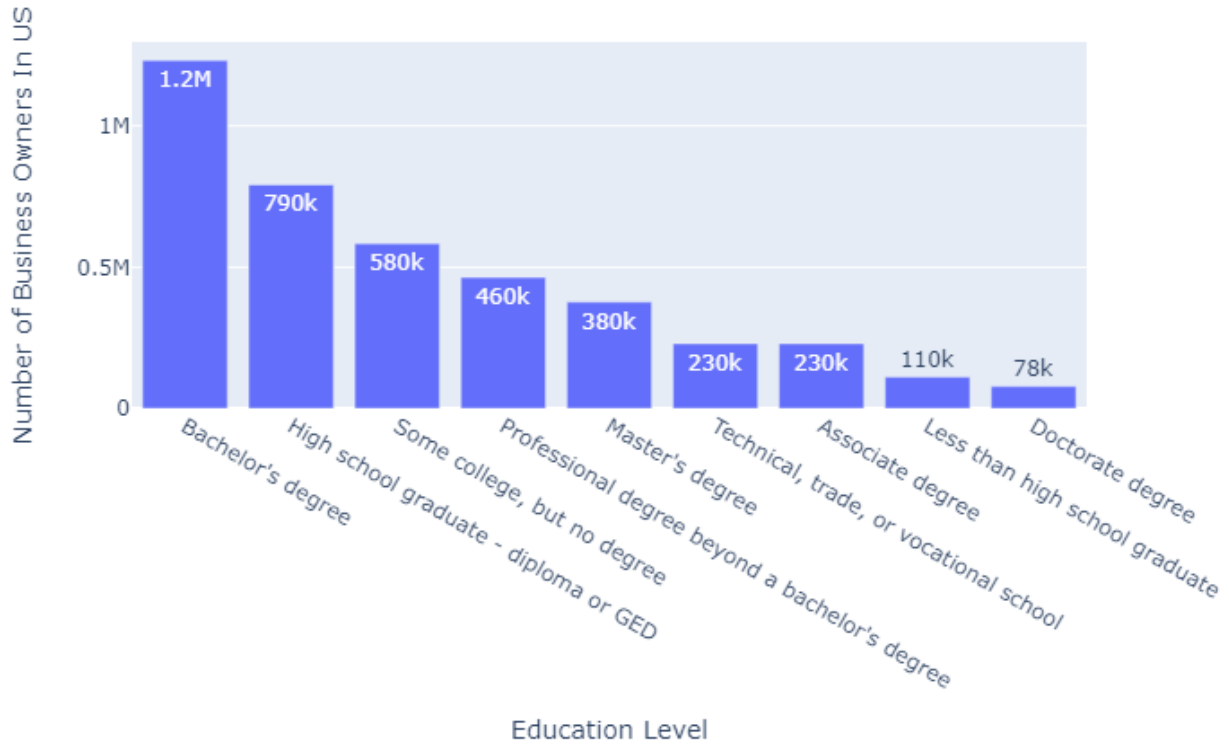

Ages of Business Owners Over 4 Years in the US

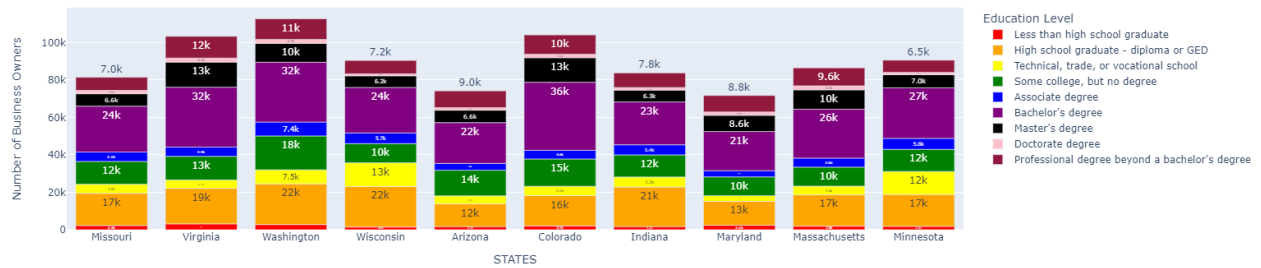Q2:According to these visuals we can determine:
- Most business owners are age group: 55-64
- Age groups 45-54, 65+, 35-44 are the next frequent age groups for business owners
- Under 25 is the lowest age group for owning their own business
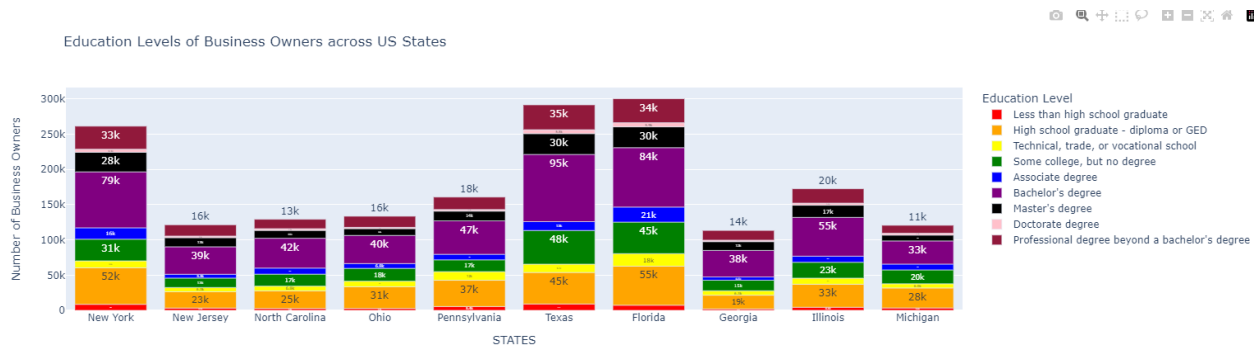- Business owners have only decreased over the past few years

Question 3: Education levels of business owners

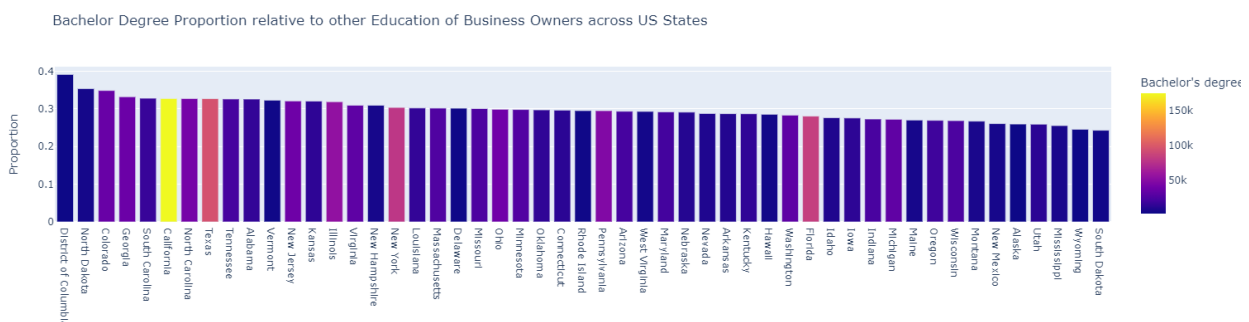### Education Levels of Business Owners in the US

Education Levels of Business Owners across US States

Education Levels of Business Owners across US States

*I have more states, but I don't want to put them all

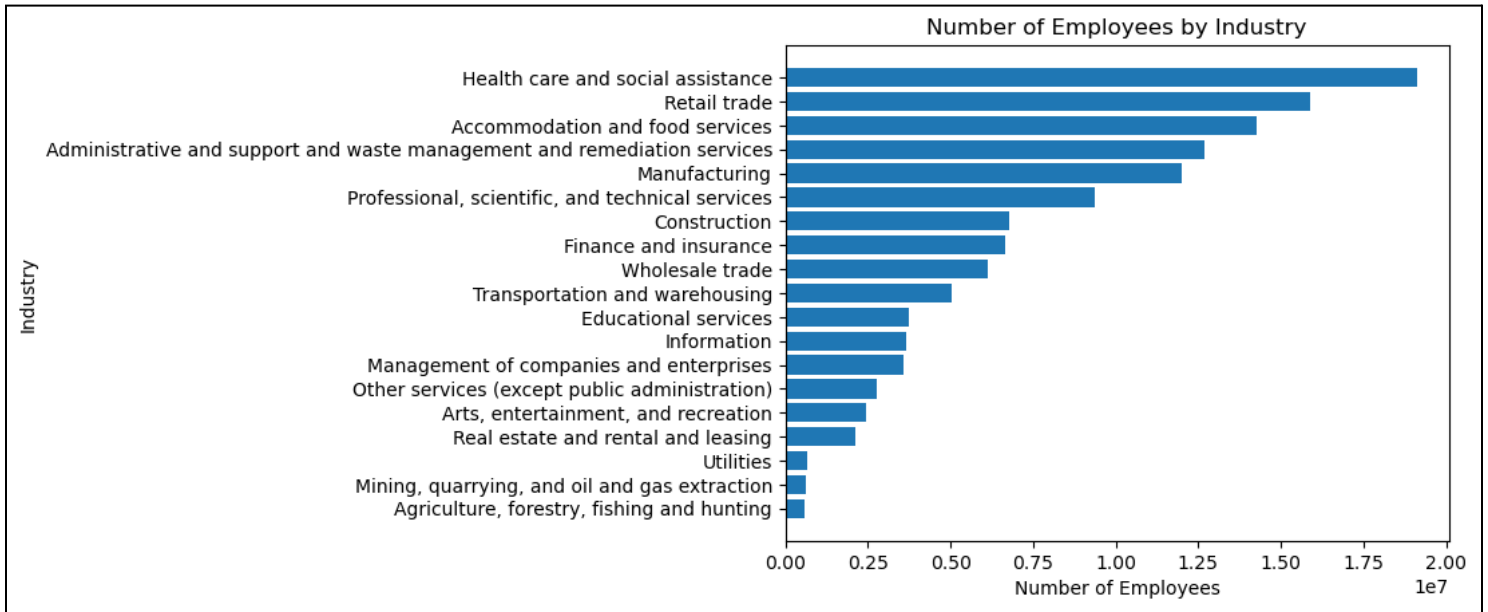Bachelor Degree Proportion relative to other Education of Business Owners across US States

● Since Bachelor's Degree was the most obtained degree for most business owners, I plotted the proportion of bachelor's degree for each state = number of business owners with a bachelor's divided by total number of business owners

Q3:According to these visuals we can determine:
● Bachelor's degree, High school graduate, and 'Some college' were the highest obtained degree/ education level for most business owners
● Doctorate degrees and 'less than a high school education' were not found often for business owners
● Statewide doesn't seem to make a significant difference for whether or not you choose a bachelor's degree over other degrees because the proportions are similar across states for business owners

From Q1-Q3, we can conclude that majority business owners tend to be in their 50s with a bachelor's or high school diploma as their educational level with similar reasons to own a business amongst them all mostly involving greater income, own boss, and good work/life balance.
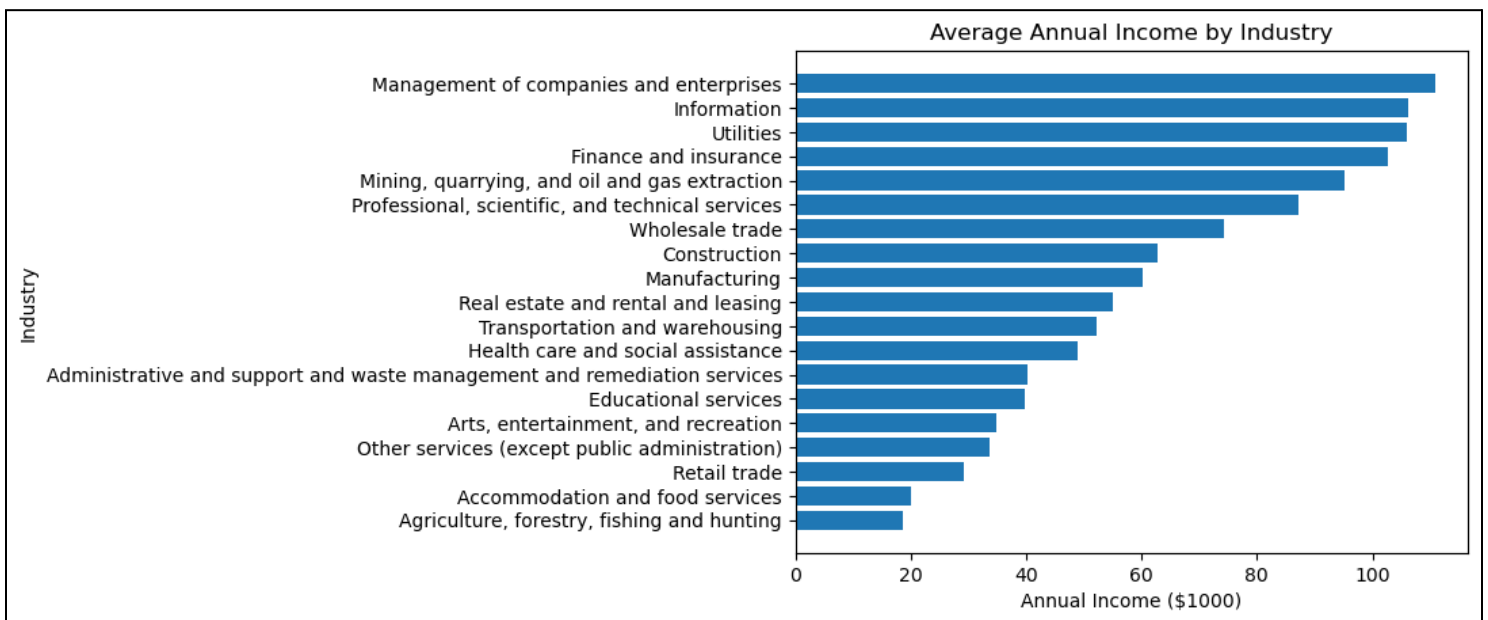
Question 4: How many employees are in each industry?

Number of Employees by Industry

Note: This data pertains to 2018.

The health care and social assistance industry had the most employees in 2018; much greater than any other industry.
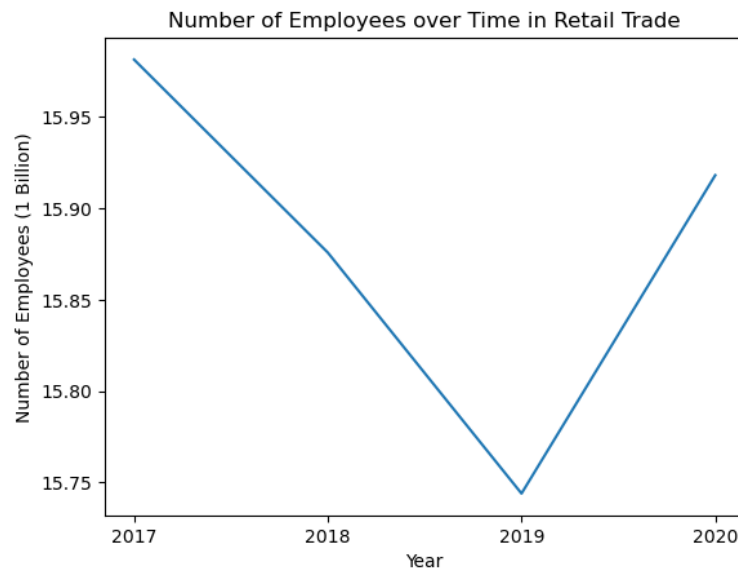
Question 5: What is the average annual salary based on industry?

Average Annual Income by Industry

Note: This data pertains to 2018.

One interesting take away from this visualization and the previous, is that in an industry with more employees, the salary is lower compared to industries that have less employees.
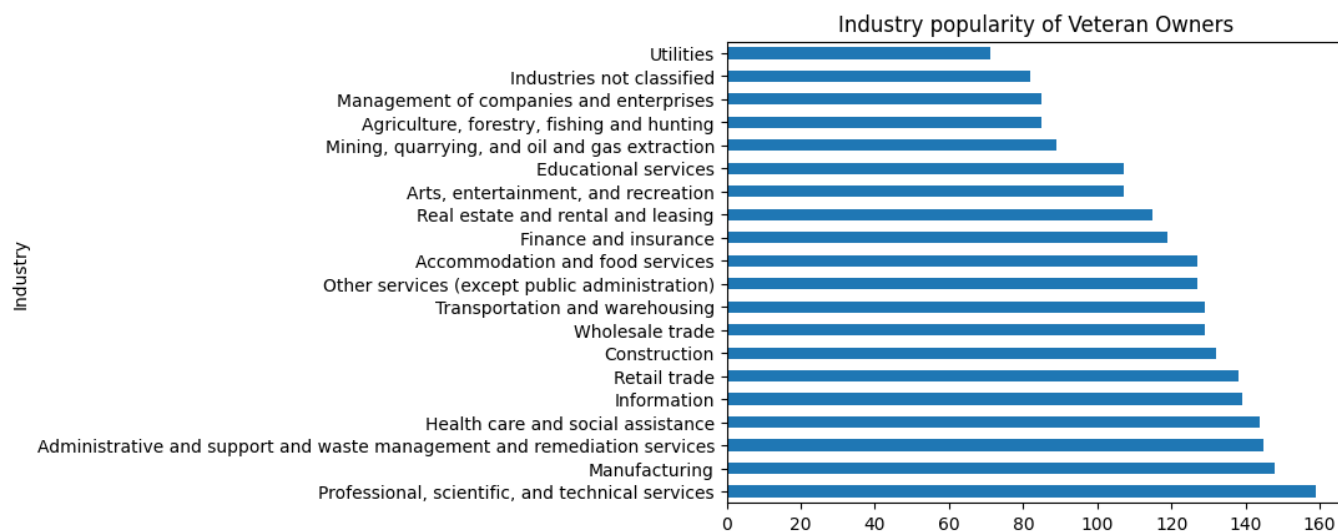
Question 6: How has the number of employees changed over time?

Number of Employees over Time in Retail Trade

According to this visualization, there was a decline in the number of employees in the retail industry in 2019. Why? Is this a normal fluctuation, or was there some other cause? More research and data would be needed since this only spans over 4 years.
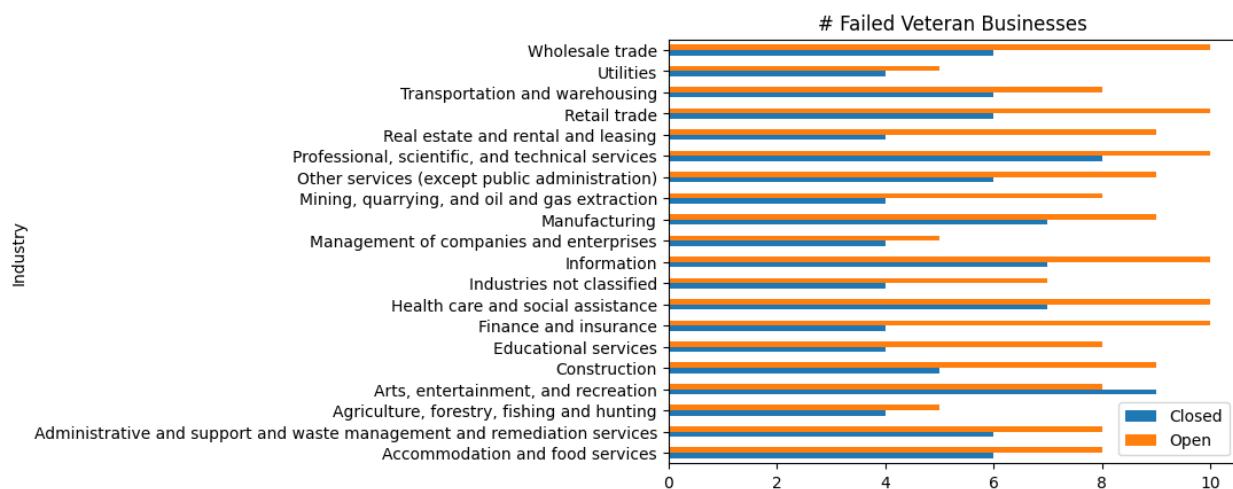
Question 7: What industries do veteran business owners prefer and struggle in?

To answer this question, we consider a few different factors. First we look at how many veterans own businesses in each industry, to determine what new retirees would most likely be interested in.
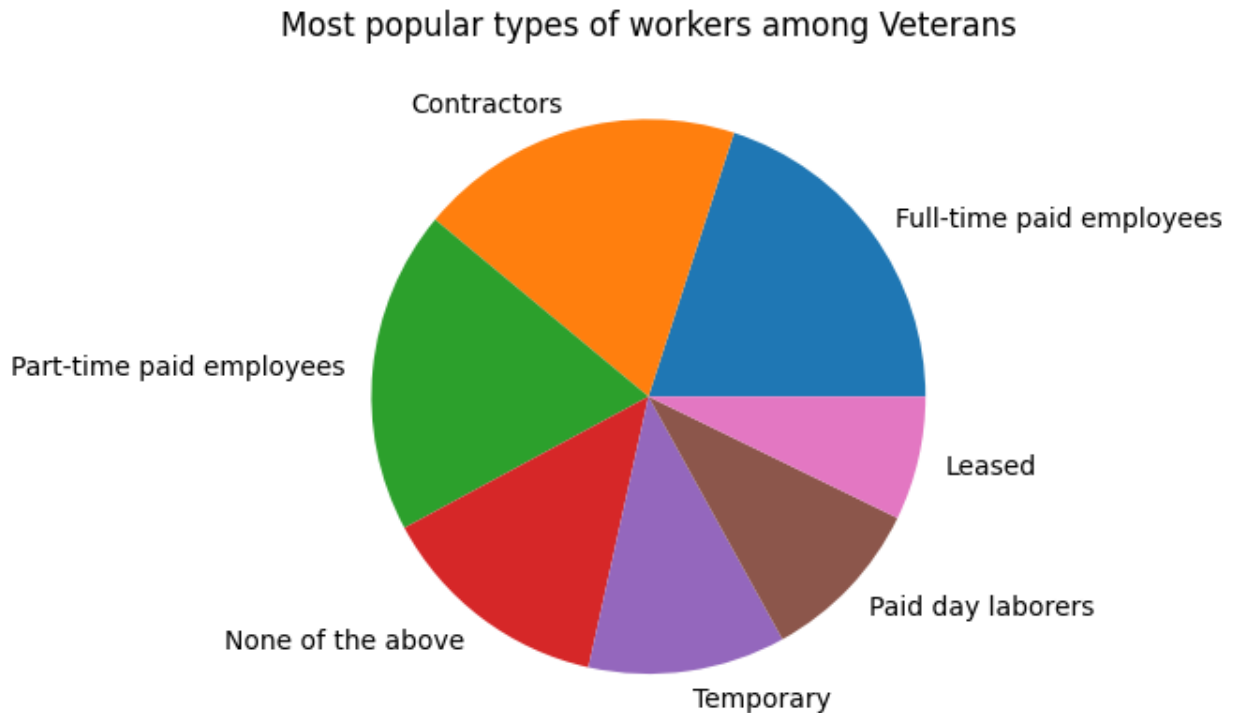

Here we see most veteran owned businesses are STEM or administration focused, with the fewest owning utility companies. This helps the VA determine how to prepare to assist veterans in starting their first company.

Next we look at what industries veterans fail in the most, to warn future retirees and explore outliers and patterns for reasons as to why.

Despite differences in ownership across the sectors, there doesn't appear to be any definitive pattern of failure across the sectors. Next steps would be to plot the number of failed businesses over time per sector, to attempt to find a pattern there.

Finally, we look at what kind of workers veteran owned businesses used, to see how often alternatives to Full-Time/Part-Time are utilized and whether or not it is worth covering in business ownership classes.

Most popular types of workers among Veterans

As is evidenced above, the most common forms of employees are full and part time, but the share is nowhere as large as thought, and contractors remain a large portion of employment options.

Conclusion:

This report covers various topics regarding business analytics, but there are a few important things to keep in mind while consuming this report/data. The data is from a survey, which presents some possible errors within the data as some survey respondents may have not reported things accurately. Another important thing to point out is that the sample size is unknown. How many businesses actually completed the survey? Sample size is important to think about as id may indicate if this is an appropriate representation for everyone. Geography/states could also have been grouped by region to give a more regional/cultural aspect to the data.