



ANALYSIS OF LAYOFFS IN THE US (2020-2023)


**Team B: Camilla Inhapim, Taylor Gibson, Arthi Ranganathan,
Lorena Egea, Sam Gantman, Toyin Olaye, Leslie Trejo, Ratima Chowadee,
Julie Tang**

WHAT MOTIVATED US TO INVESTIGATE LAYOFF PATTERNS IN THE UNITED STATES?

- Recent layoffs raised concerns about impacts on our professional aspirations post bootcamp
- Insights into
 - Health of the labor market across industries
 - Economic stability
- Impacts of recent historical events on different sectors of the economy

WHERE WE FOUND THE DATA, AND HOW WE CLEANED IT FOR OUR PURPOSES:


● Kaggle

 AKHIL · UPDATED 8 HOURS AGO

53New NotebookDownload (143 kB)

Layoffs Dataset 2023

Layoffs Data from 2020-2023



[Data Card](#)[Code \(13\)](#)[Discussion \(1\)](#)

About Dataset

Context

This dataset was scraped from Layoffs.fyi with the hope to enable Kaggle community to look into analyzing recent mass layoffs and discover useful insights and patterns.

Original dataset can be tracked at <https://layoffs.fyi/>

Credits: Roger Lee

Usability ☺
10.00

License
Database: Open Database, Cont...

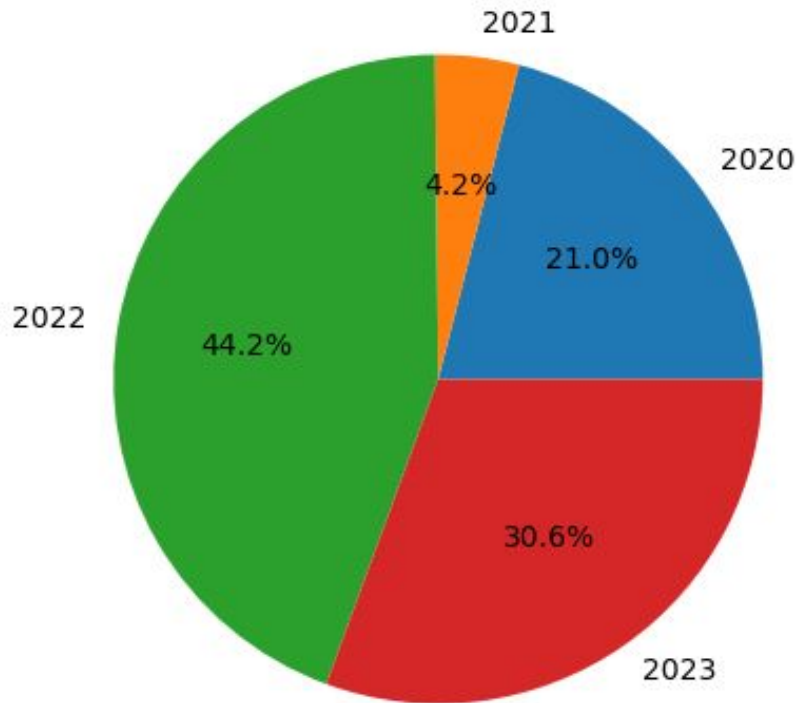
Expected update frequency
Weekly

Data Cleaning Process	
Goal:	Code:
Work on layoffs in US from US companies	Filter by US on Country column: layoffs occurred in US
	Merge the dataset with a csv file with all the US cities : companies in US
Make sure we can join the datasets	Replace 3 cities (e.g.: SF Bay Area to San Francisco) and rename city column to match the location column
Remove duplicated cities and city with global names (e.g.: Vancouver)	Filter by city ranking equals 1 (big cities)
Merge the 2 cvs files	Merge the 2 cvs files
Complete the data cleaning	Drop unnecessary columns
	Drop NA
	Check for duplicates
	Reset index

QUESTION 1: IN WHICH SECTORS DID MOST LAYOFFS TAKE
PLACE IN THE YEARS OF 2020-2023?

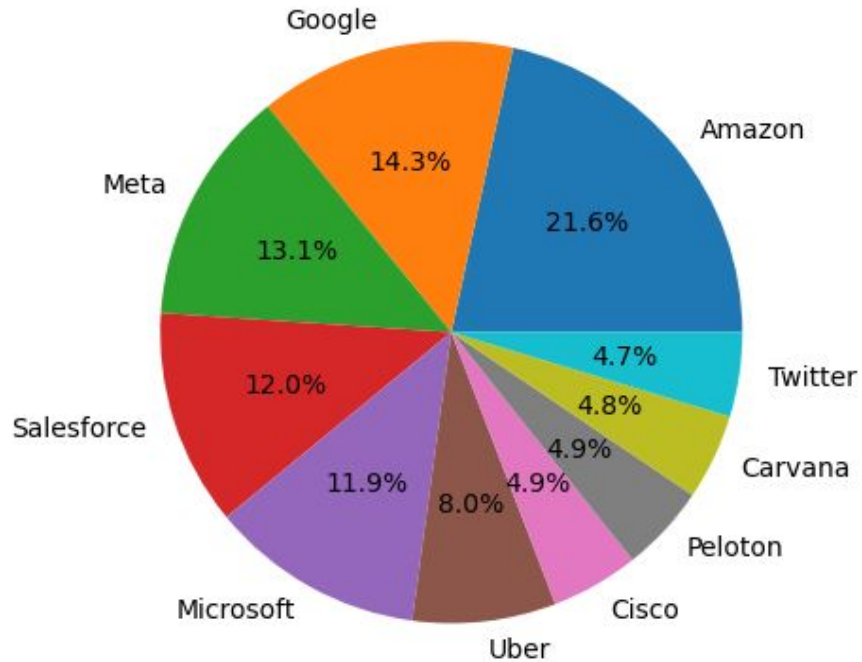
Team Members: Ratima Chowadee, Lorena Egea

Number of Layoffs Per Year



- Layoff rates vary considerably across the 4 years
- Total layoff count: 226,546
- 2020: COVID-19 pandemic started spreading in the US, leading to a widespread disruption to the economy
- 2021: reduced layoff rate after mass layoff wave, and businesses adapting to the pandemic
- 2022: highest percentage of layoffs, coinciding with the Russian invasion of Ukraine, and inflation rising globally
- 2023: mass tech company layoff

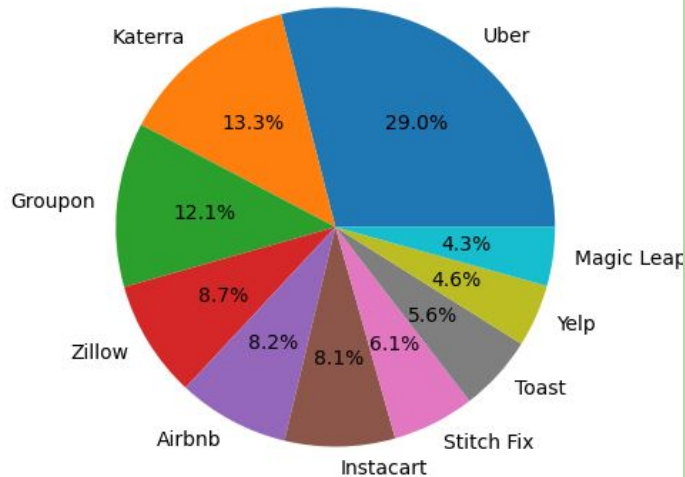
Top 10 Companies With The Most Layoffs 2020-2023



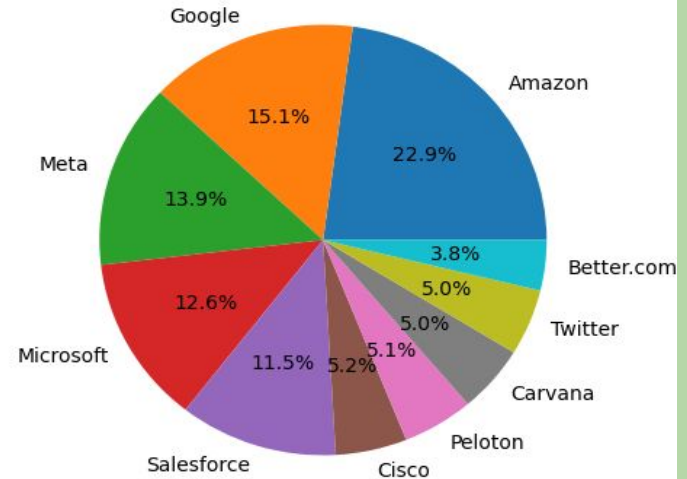
- Most layoffs throughout the last 4 years occurred in the tech sector

- We split the data to reflect the two mass layoff waves
- Overall distribution is very similar to the distribution in 2022-2023, but not to 2020-2021
- Rising demand for tech workers during the pandemic
- Reduced consumer demand for tech platforms after the pandemic

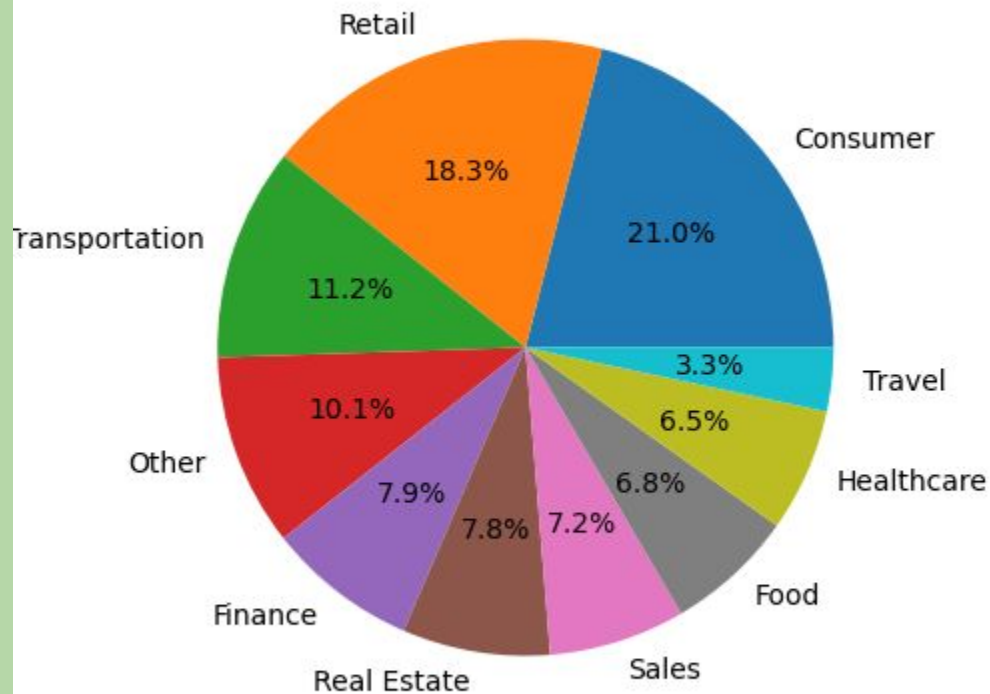
Top 10 Companies With The Most Layoffs 2020-2021



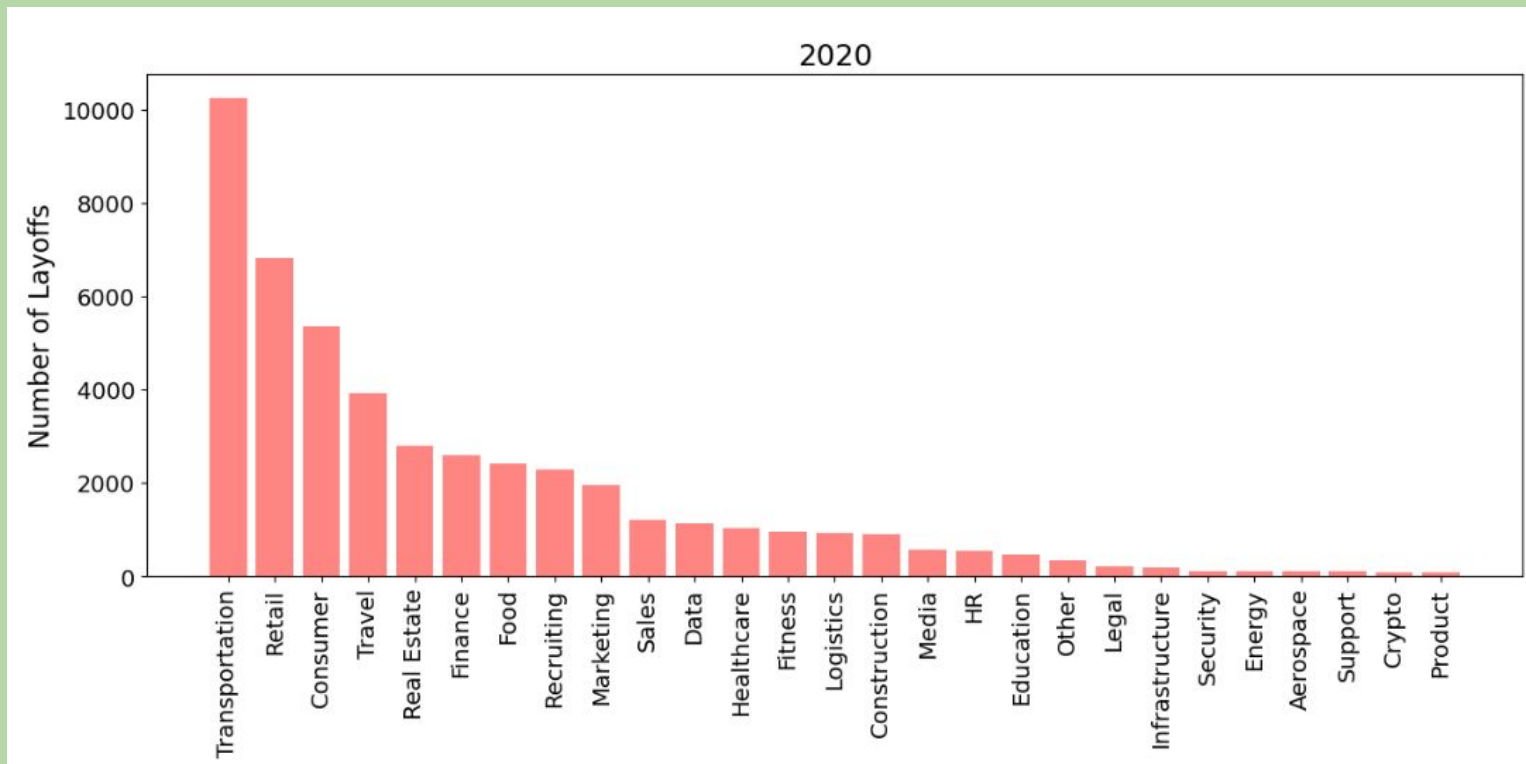
Top 10 Companies With The Most Layoffs 2022-2023



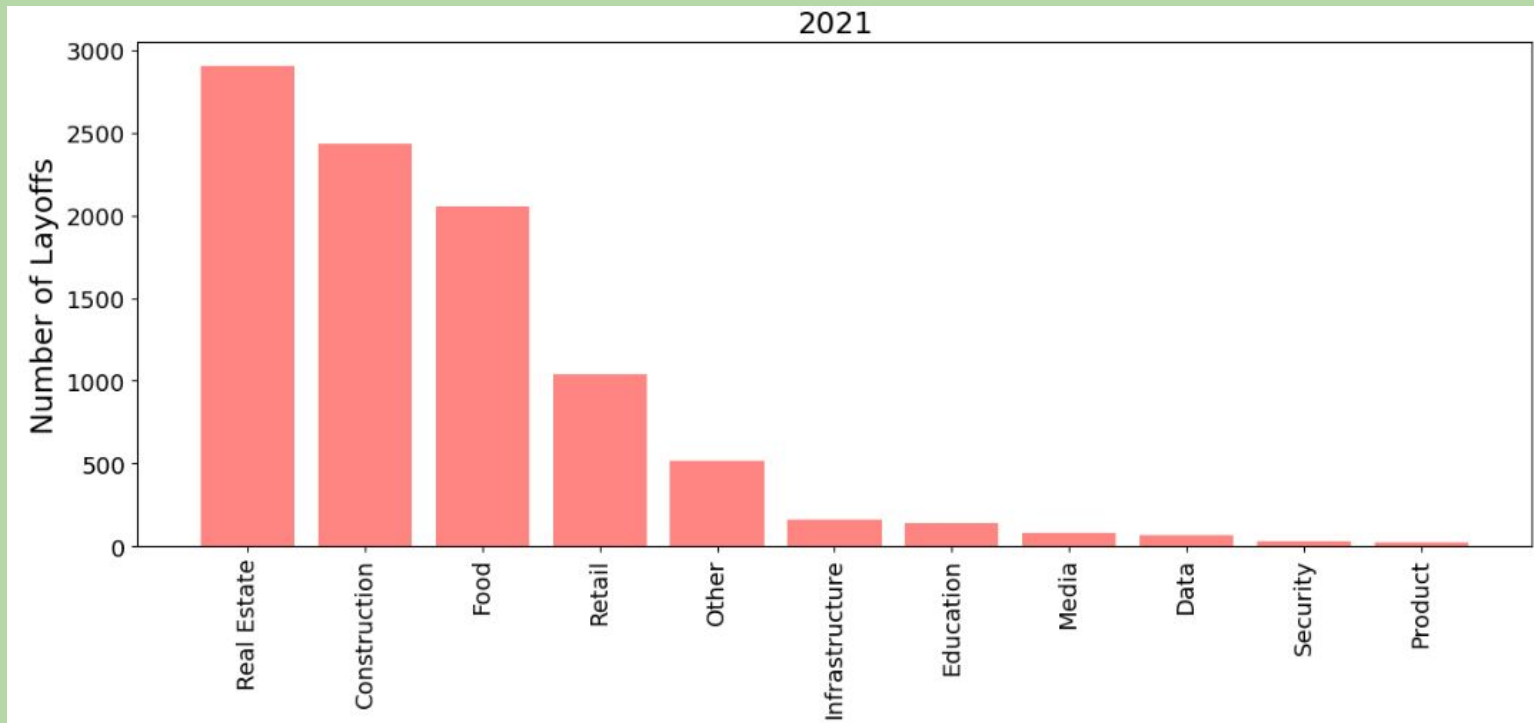
Top 10 Industries With The Most Layoffs 2020-2023



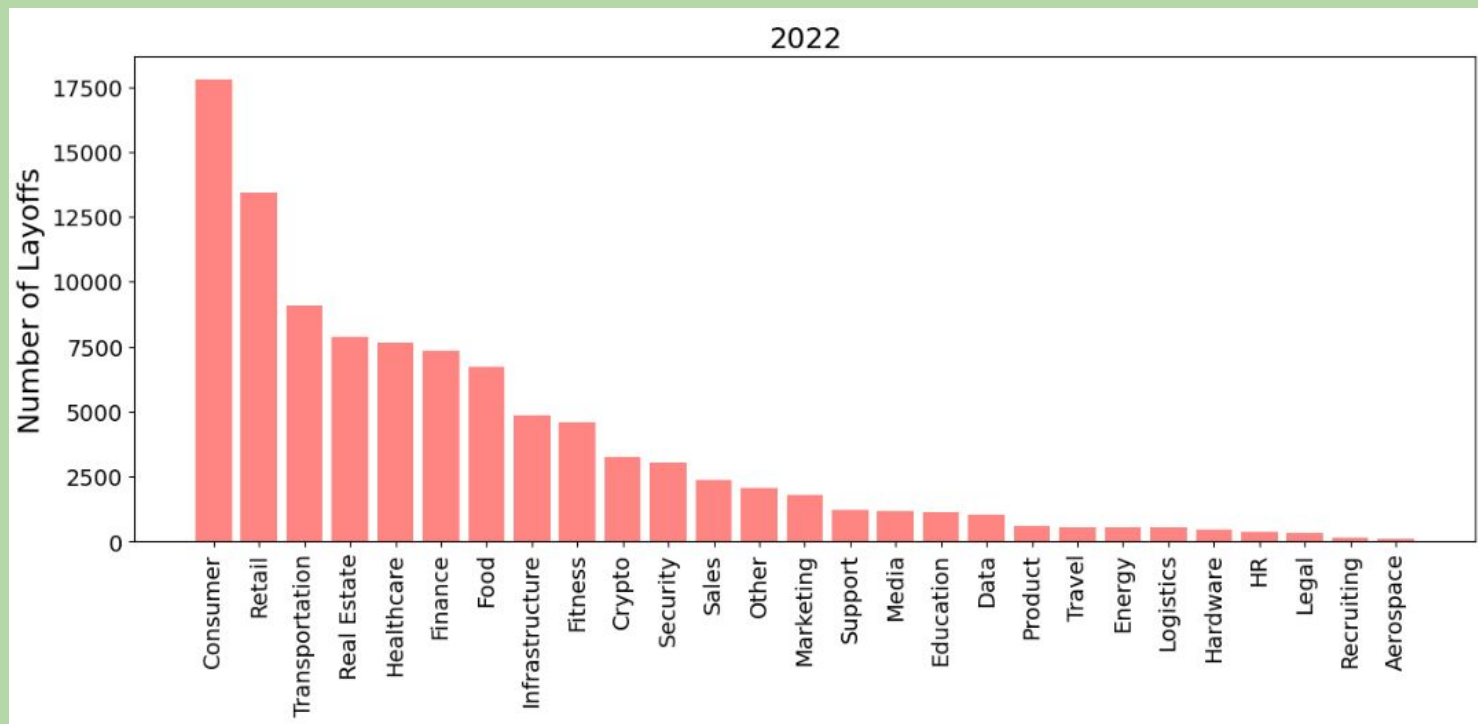
LAYOFFS PER INDUSTRIES: 2020



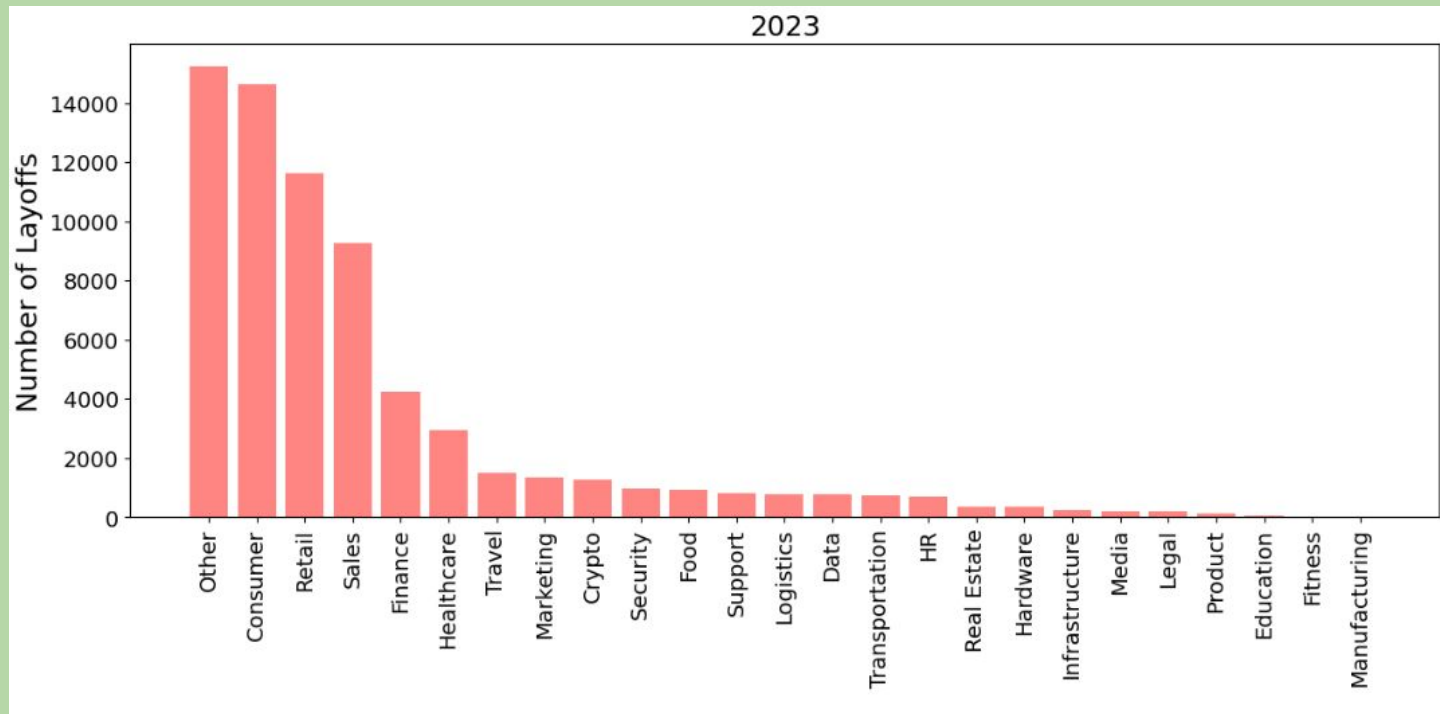
LAYOFF PER INDUSTRIES : 2021



LAYOFFS PER INDUSTRIES: 2022



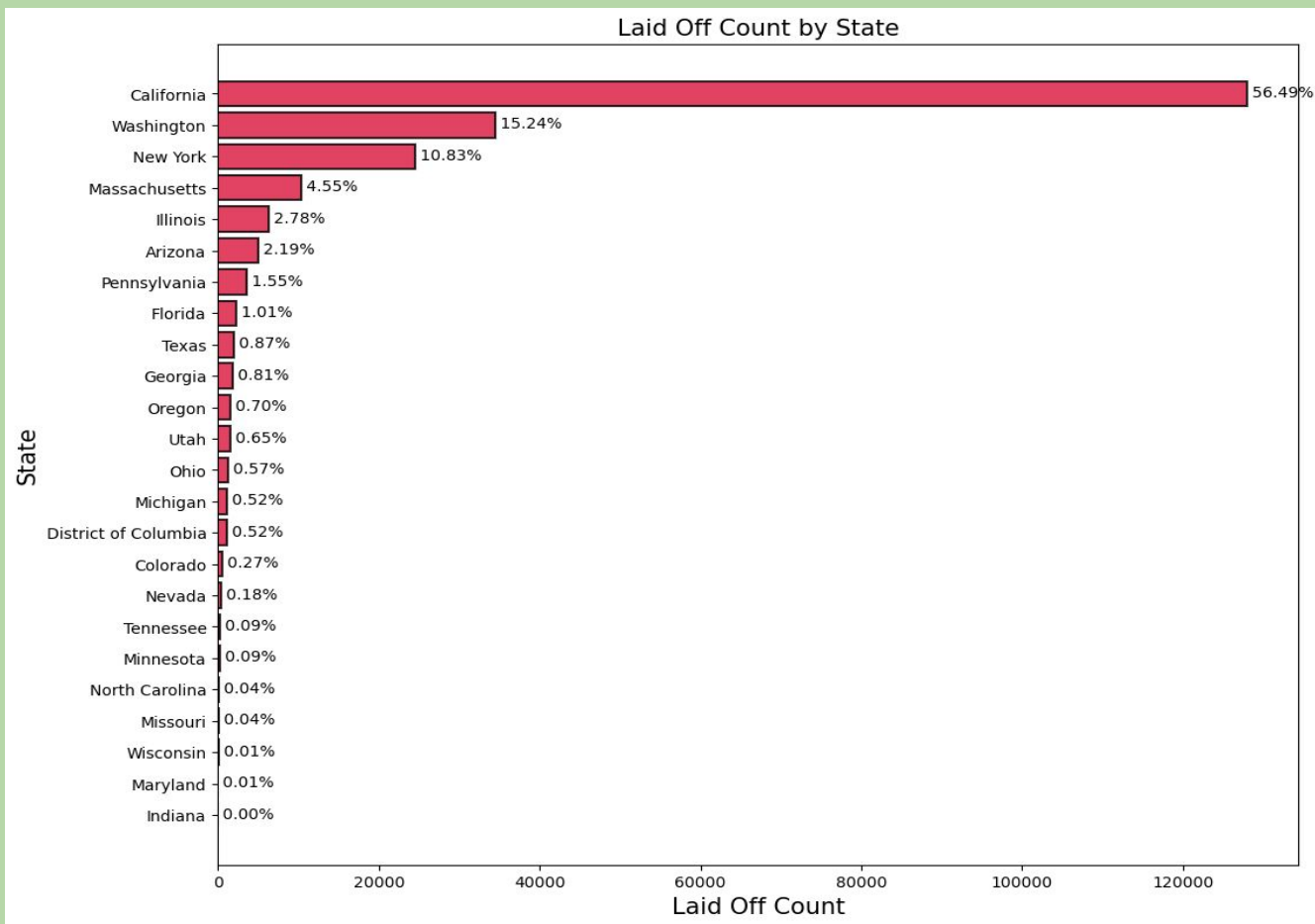
LAYOFF PER INDUSTRIES: 2023



QUESTION 2: IS THERE A CORRELATION BETWEEN THE US STATE
AND THE LAYOFF RATE? WHICH STATE HAS THE MOST LAYOFFS?

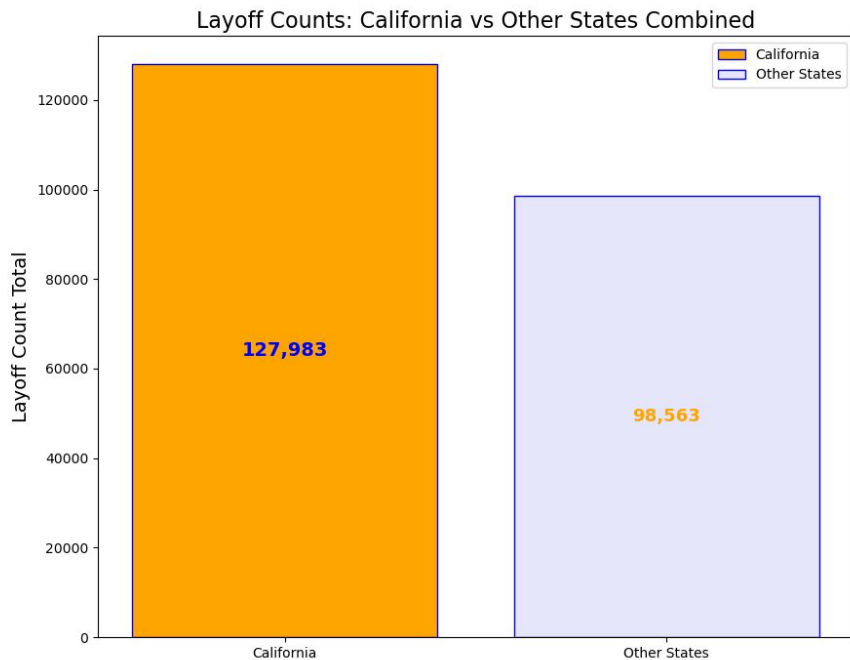
Team Members: Toyin Olaye, Leslie Trejo, Camilla Inhapi

PER STATE: LAYOFF COUNTS BY STATE



Data analysis
per state.
Total layoff
counts.
California
accounts for
over 56% of
our data.

PER STATE: CA VS OTHER STATES

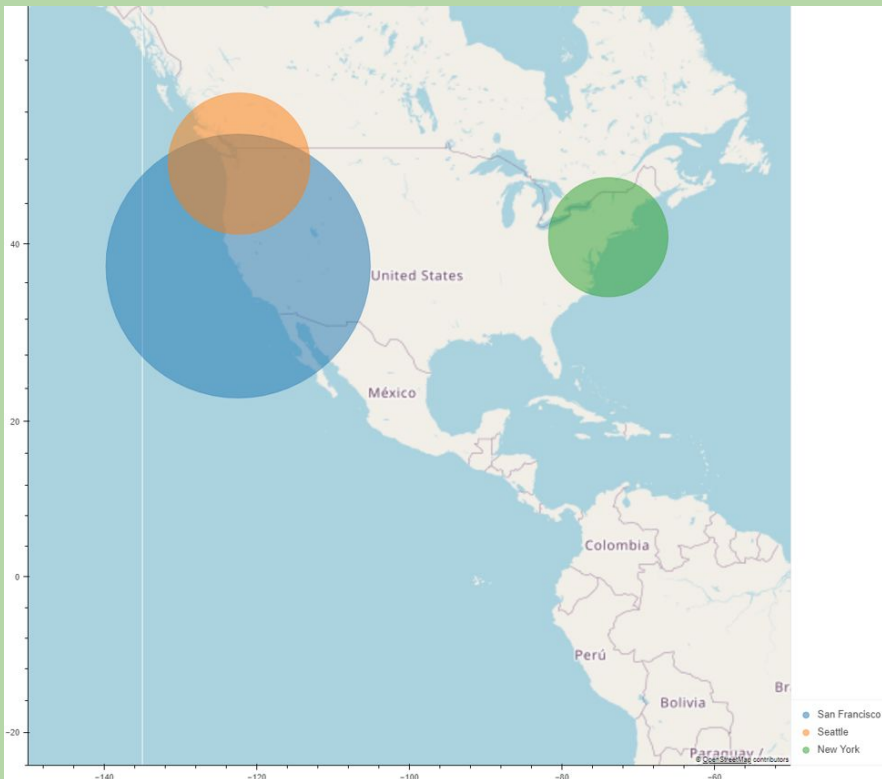


California by itself accounted for 127,983 lay off counts for our dataset. In comparison to a combined total of 98,563 for the other 26 states in our dataset combined.

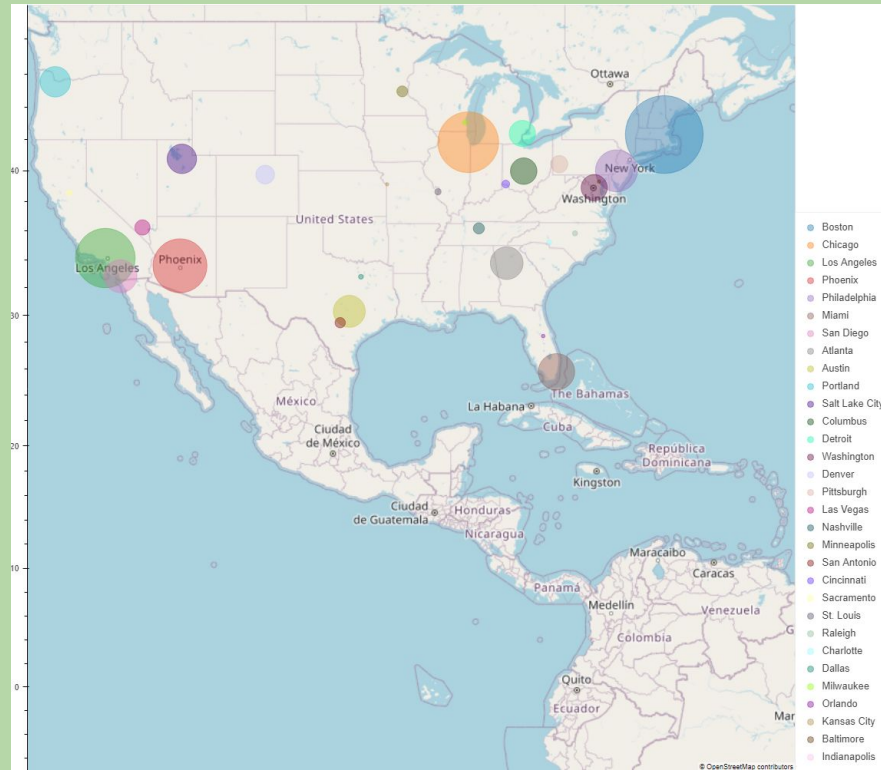
PER CITY

SF Bay Area, Seattle and New York are 79.07% of the layoffs. The other 31 cities are 20.93% of the layoffs.

Top 3 cities



Other 31 cities

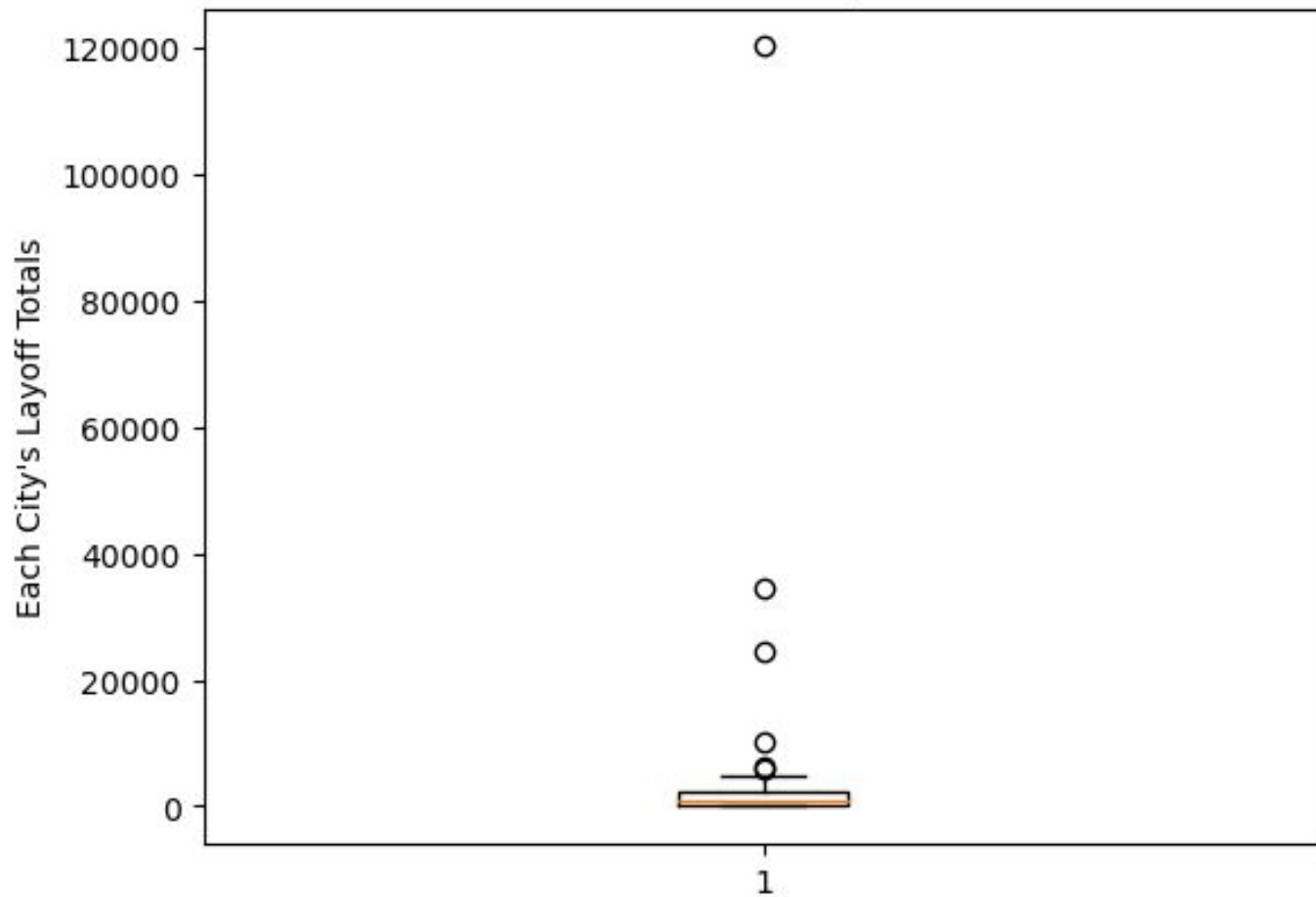


PER CITY: LAYOFF COUNTS BY CITY

	City_Name	Latitude	Layoff_Count
0	San Francisco	37.7562	120061.0
1	Seattle	47.6211	34526.0
2	New York	40.6943	24544.0
3	Boston	42.3188	10299.0
4	Chicago	41.8373	6289.0
5	Los Angeles	34.1139	6014.0
6	Phoenix	33.5722	4954.0
7	Philadelphia	40.0077	2989.0
8	Miami	25.7839	2261.0
9	San Diego	32.8312	1843.0
10	Atlanta	33.7627	1827.0
11	Austin	30.3004	1739.0
12	Portland	45.5372	1581.0
13	Salt Lake City	40.7777	1478.0
14	Columbus	39.9862	1195.0
15	Detroit	42.3834	1180.0
16	Washington	38.9047	1169.0

17	Denver	39.7621	602.0
18	Pittsburgh	40.4396	513.0
19	Las Vegas	36.2333	405.0
20	Nashville	36.1715	214.0
21	Minneapolis	44.9635	207.0
22	San Antonio	29.4658	186.0
23	Cincinnati	39.1413	106.0
24	Sacramento	38.5667	65.0
25	St. Louis	38.6358	65.0
26	Raleigh	35.8325	45.0
27	Charlotte	35.2080	44.0
28	Dallas	32.7936	41.0
29	Milwaukee	43.0642	35.0
30	Orlando	28.4772	24.0
31	Kansas City	39.1239	20.0
32	Baltimore	39.3051	20.0
33	Indianapolis	39.7771	5.0

Number of Layoffs

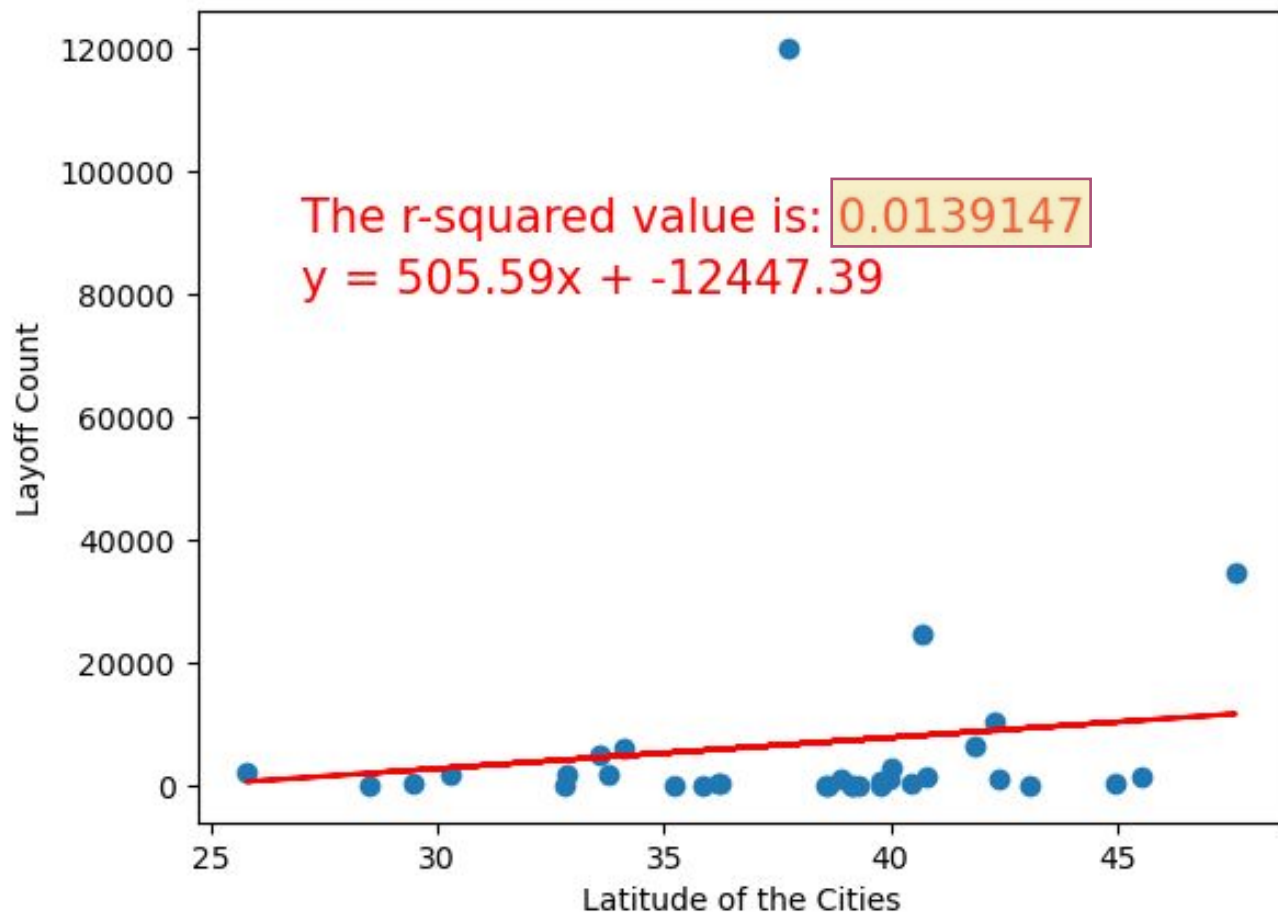


The lower quartile of city layoffs: 65.0
The upper quartile of city layoffs: 2156.5
The interquartile range of city layoffs: 2091.5
The the median of city layoffs: 885.5
Values below -3072.25 could be outliers.
Values above 5293.75 could be outliers.

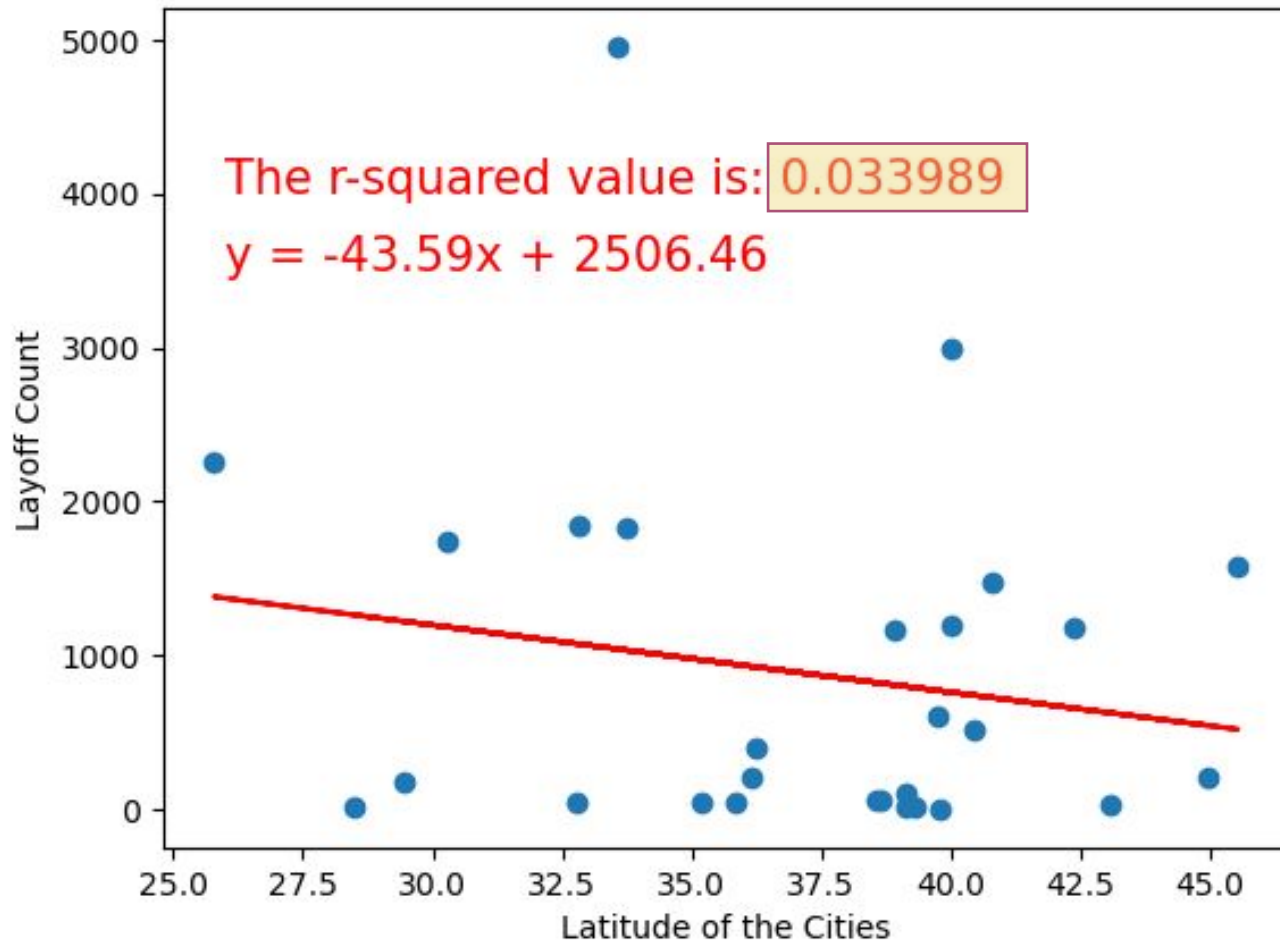
[6014.0, 6289.0, 10299.0, 24544.0, 34526.0, 120061.0]

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Scatter Plot With Outliers



Scatter Plot Without Outliers



CONCLUSIONS

- Outliers did not impact data
- Data proves no correlation
- Regressions provide no predictability

The latitude of Houston Texas is 29.7407

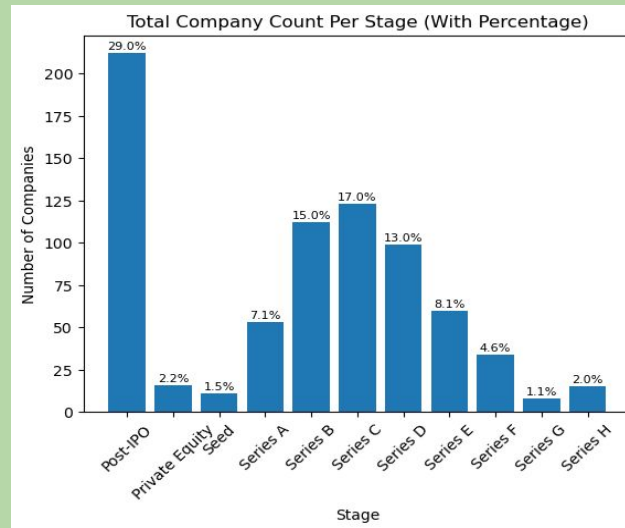
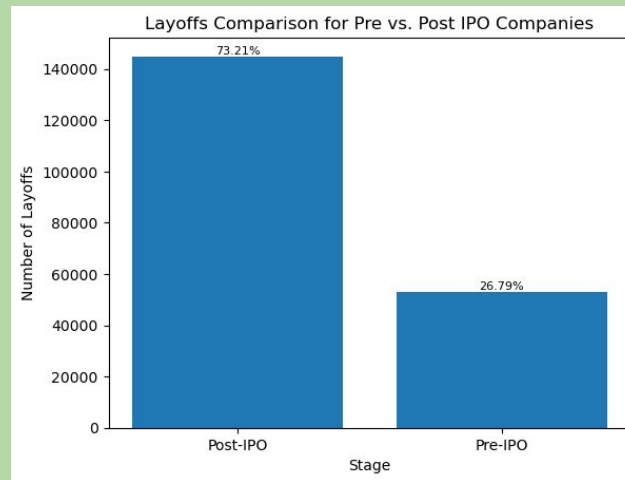
$$y = -42.35(29.7407) + 2506.46 = 1209.6$$

QUESTION 3: DOES THE COMPANY'S STAGE IMPACT THE LAYOFF COUNT?

Team Members: Julie Tang, Sam Gantman

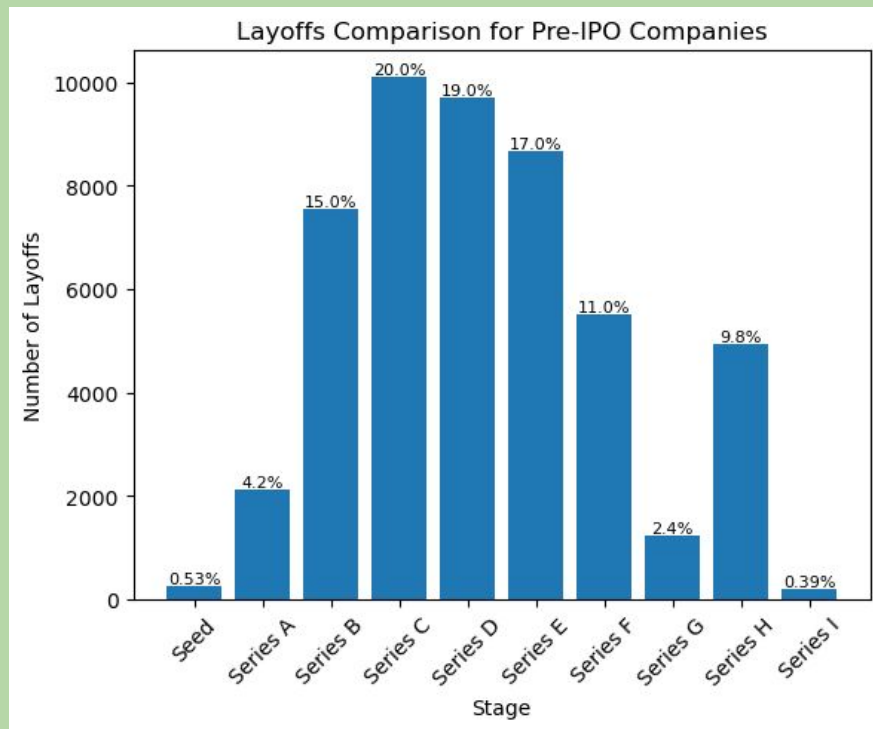
WHICH STAGE DO PRE-IPO COMPANIES EXPERIENCE THE MOST LAYOFFS?

- Filtered out "Unknown", "Subsidiary", and "Acquired" stages due to uncertainty in IPO status
- Pre-IPO includes stages Private Equity, Seed, & Series A-I
- Total of 743 companies analyzed
- Takeaway: ~75% of the layoffs were from Post-IPO companies, but only ~30% of the companies had IPO-ed



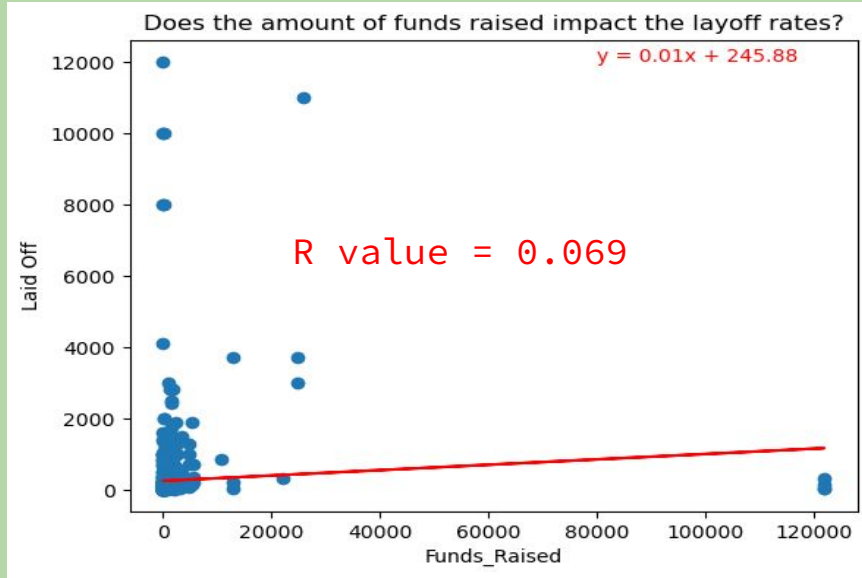
WHICH STAGE DO PRE-IPO COMPANIES EXPERIENCE THE MOST LAYOFFS?

- Stages vary by amount of funds raised (funding round) and current growth stage (development, hiring, marketing, expansion, etc)
- Stage C account for the most layoffs (20%)
- During Stage C, companies are focused on expansion, scaling the company by acquiring other companies
- Hedge funds and investment banks are examples of investors
- Many companies are able to IPO after Series C
- Series D & E are only needed if they need extra funding before IPO

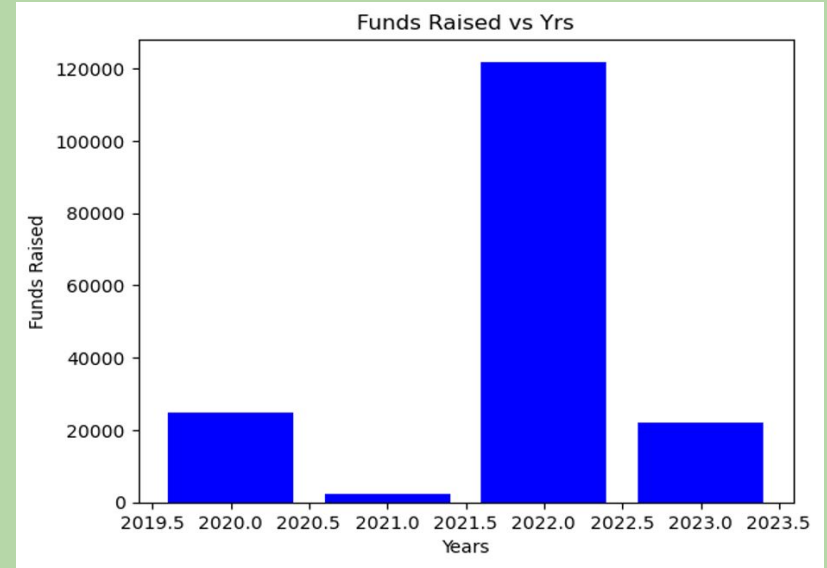
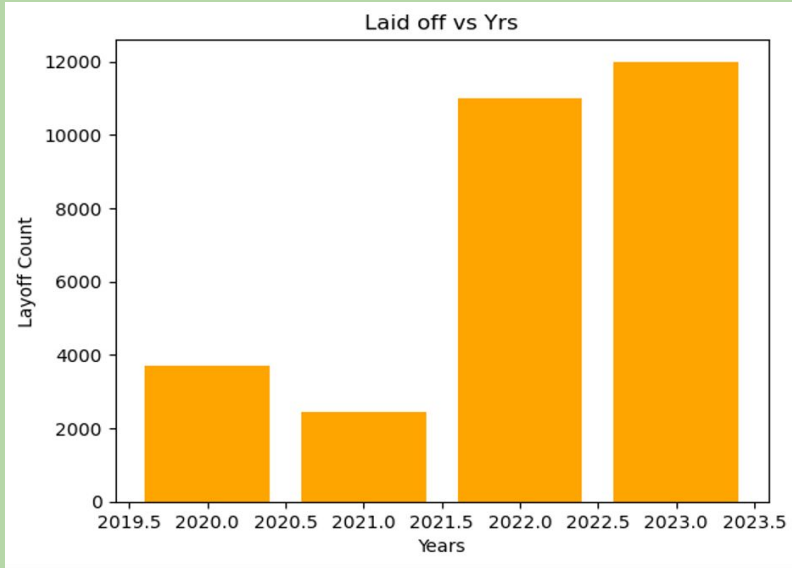


QUESTION 4: DOES THE AMOUNT OF FUNDS RAISED BY A
COMPANY IMPACT THE COMPANY'S LAYOFF COUNT?

Team Members: Taylor Gibson, Arthi Ranganathan



- Funds raised refers to the revenue generated by the company.
- There is no linear correlation between the companies' funds raised and their layoff counts.
- The top five companies that generated the most revenue (Netflix, Meta, Uber, WeWork, Twitter), had varying layoff counts (505, 11,000, 7,585, 600, 3940, respectively).
- Layoffs are not directly related to the revenue generated by a company and are commonly executed for reasons such as relocation, overstaffing and cost-cutting.
- Our data does not give us a breakdown of budgets or operating costs, which can also be a reason for layoffs not related to the actual amount of revenue a company is generating.



- Many companies have attributed the layoff counts to a period of over-hiring that took place during-pandemic. As time lapses, companies no longer have a need for excess employees.
- In 2023, layoff rates have been higher than any year in the dataset, however, Q1 is not completed.

CONCLUSION

- Recently, layoffs have been increasing at an alarming rate
- After examining our data set...
 - Most layoffs occurred in years of 2022 and 2023
 - Tech companies have the highest amount of layoffs in comparison to other companies with Amazon laying off the most workers
 - California has the most layoffs compared to all other states combined
 - San Francisco, New York City, and Seattle accounts for over 79% layoffs in regards to U.S. cities
 - Post-IPO (Public companies) have account for majority of layoffs at 73.2% but only 29% of our data set are post-IPO companies
 - There is not a strong correlation with funding and layoffs

Questions?