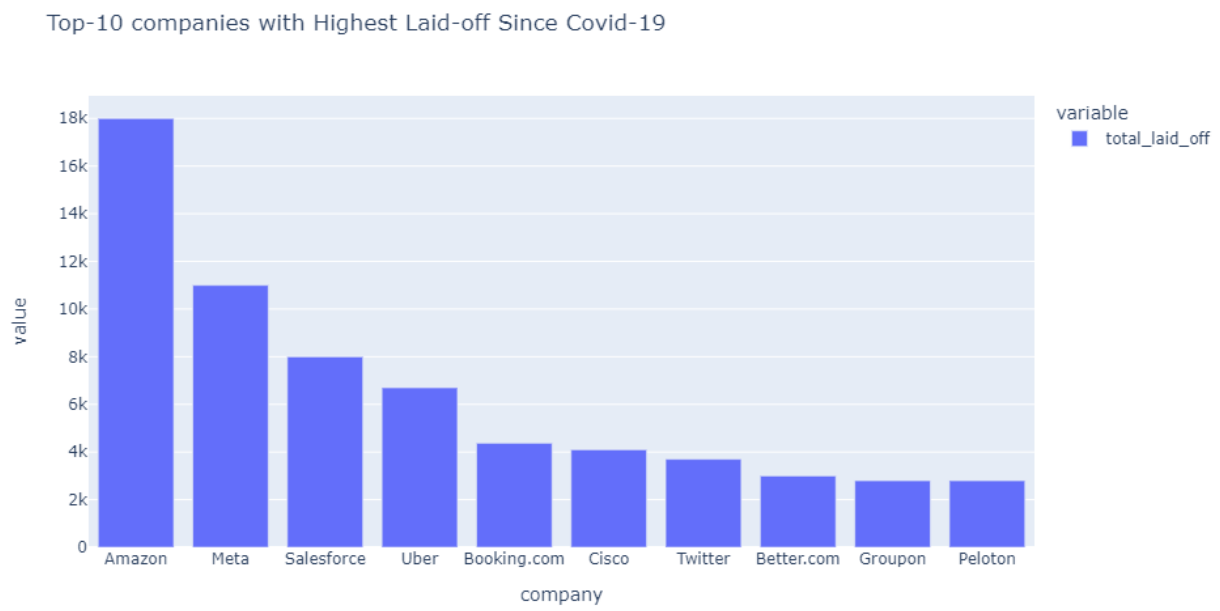
Mass TECH Layoff Wave

Since the Commencement of Covid-19

The COVID-19 pandemic has resulted in widespread economic disruption, leading to a significant increase in layoffs across many industries. Many companies have to reduce their workforce due to decreased demand for goods and services, supply chain disruption, and closure of non-essential businesses.

Governments has also implemented measures such as mandatory quarantines and social distancing that have further access exacerbated the economic impact of the pandemic. As a result, many people have lost their jobs or experienced reduced hours or pay.

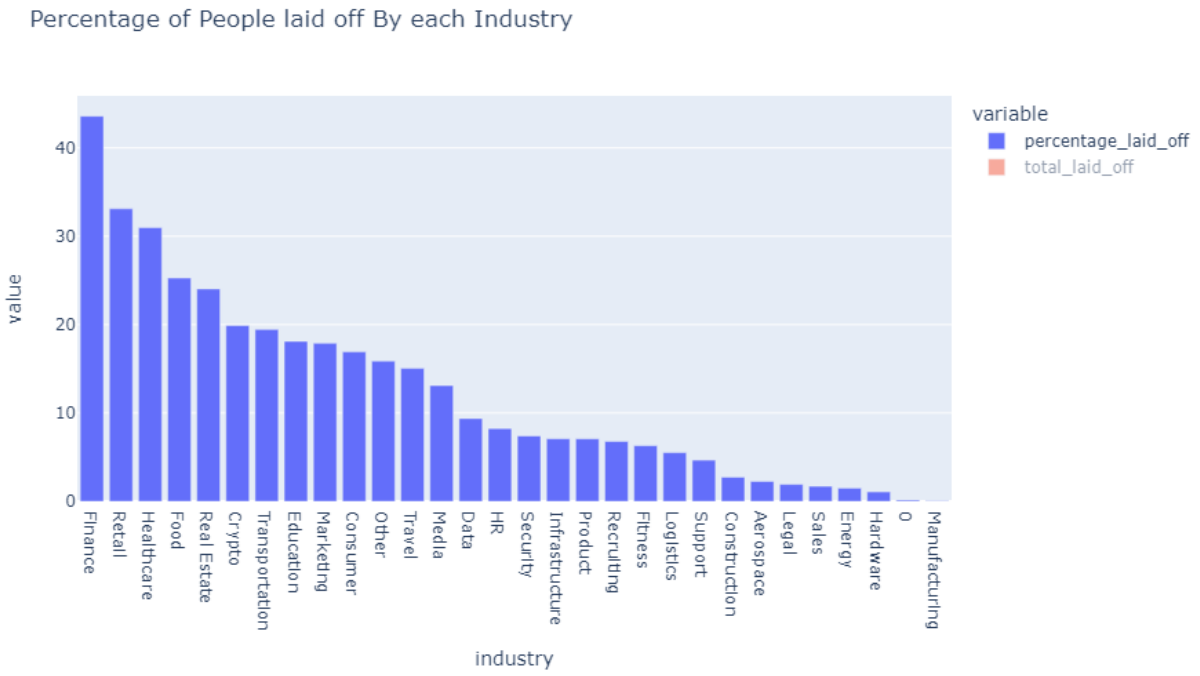
Here are some findings, where highest Layoff has happened



Sector Wise Layoff by Each Industry

The COVID-19 pandemic has had a significant impact on many different sectors of the economy and the extent of layoffs oh has varied depending on the specific industry some of the sectors that have been particularly hard hit include:

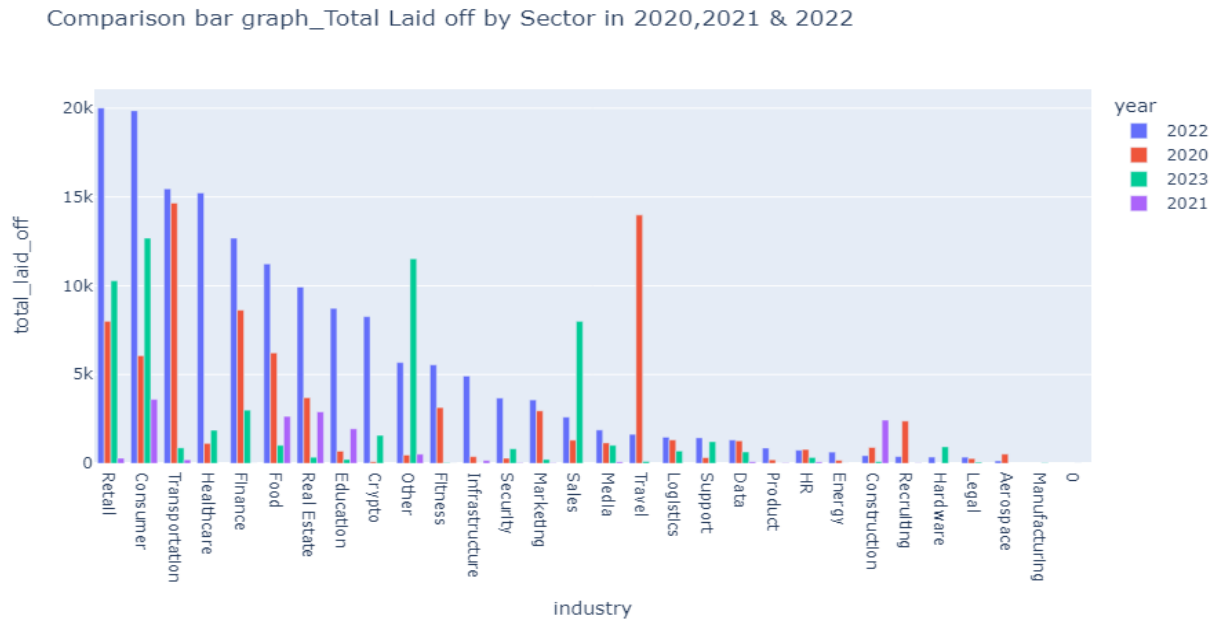
For More Interesting insights do visit https://www.kaggle.com/code/virajvhatkar/layoff-data-set-2022?scriptVersionId=132575797

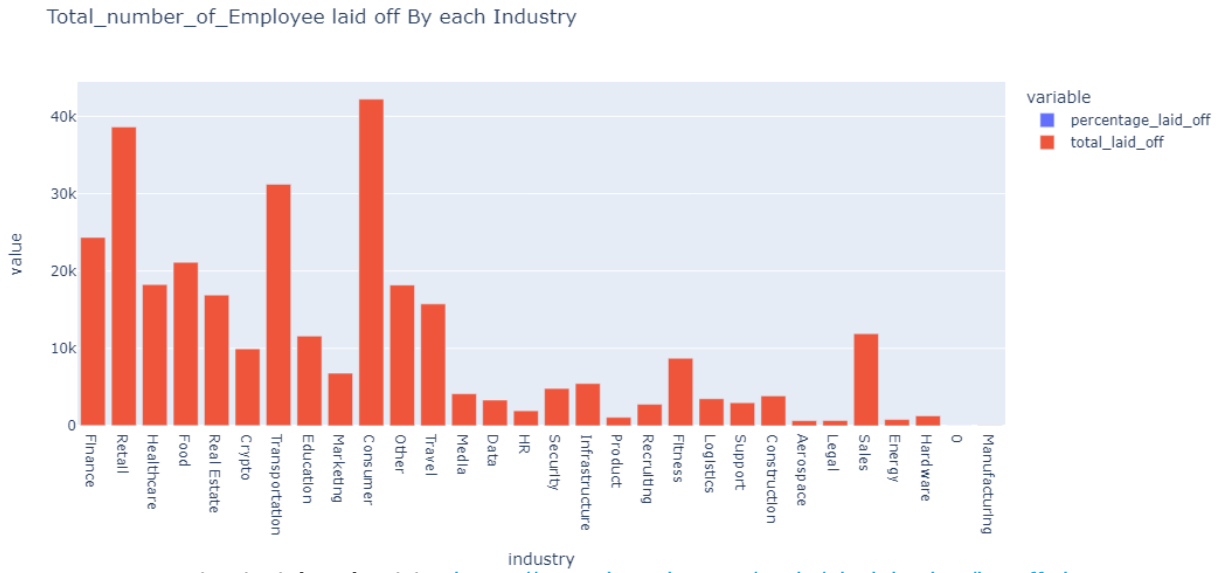


- **Retail**: Many physical retail stores have had to close or reduce their hours due to lockdown and social distancing measures, which has led to a significant number of layoffs up to *33.12% i.e. 38.579k(in thousand)* in the retail sector.
- **Transportation**: The transportation sector has been significantly impacted by *19.454% i.e.31.184k(in thousand*) from the COVID-19 pandemic with many companies experiencing a decline in demand and revenue resulting in layoffs. With lockdowns and social distancing measures in places many people have been working from home resulting in decline in ridership on public transportation which led to a decrease in revenue for public transit systems. Because of Disruption in global supply chains which has led to slowdowns or closure for many manufacturing operations as a result the demand for logistic services has decreased and companies had to layoff its employees. For trucking the decline in manufacturing and retail activity led to a decrease for the demand of trucking services resulting in the reduction of the workforce in trucking companies. For ridesharing sector because of lockdown and quarantine measures the demand for ride sharing services drastically decreased thus companies like Uber, Ola and other companies started to reduce the number of drivers and its employees.
- **Tourism and hospitality:** With travel restrictions and a decrease in consumer demand, many hotels, resorts, and restaurants have had to close or significantly reduce their operations. This has led to many layoffs up to *15.05% i.e. 19.584k(in Thousand*) in these industries.
- **Healthcare:** While healthcare workers have been in high demand during the pandemic, certain areas of the healthcare industry such as elective procedures has seen a decrease in demand and thus layoffs. The decline in demand for certain medical devices such as those used in elective surgeries resulting in reduction in revenue and thus layoffs up to *31% i.e. 18.216k(in thousand)* in various medical device companies.

- **Real estate:** The pandemic has resulted in a decline in demand for housing, commercial, real estate, for property management services and also a decline in demand for new real estate developments because of this people have been hesitant to buy or rent homes due to economic uncertainty .Many businesses have closed or reduced their operations due to lockdowns and social distancing measures this has led to a reduction in the number of transactions thus layoffs up to *24.045% i.e 16.825k(in thousand*)in the in these real estate sector

  The Most affected sectors been Consumer, Retail, Transportation, Food, Travel and etc. And the Trend continues for Retail, Consumer and Sales.





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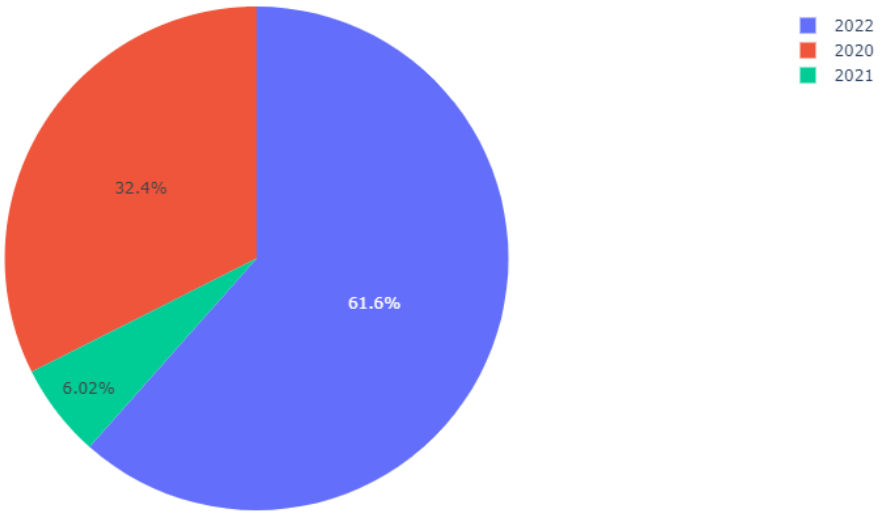
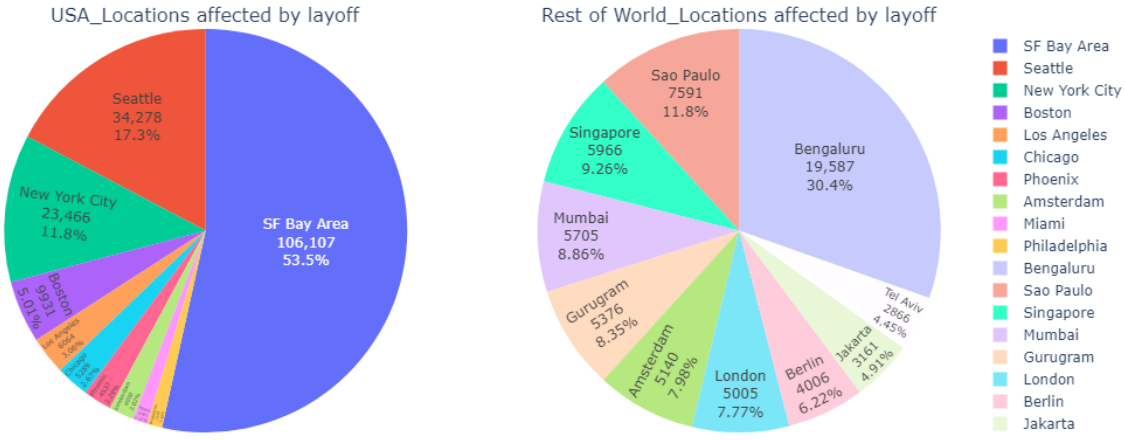
Here Is a pie Diagram Showing the % of Employee been Laid-off By Year:

2022 been the Highest followed by 2020.



In United States alone SFO has been affected the most by the Layoff and Outside USA Bengaluru, INDIA has been affected the most.



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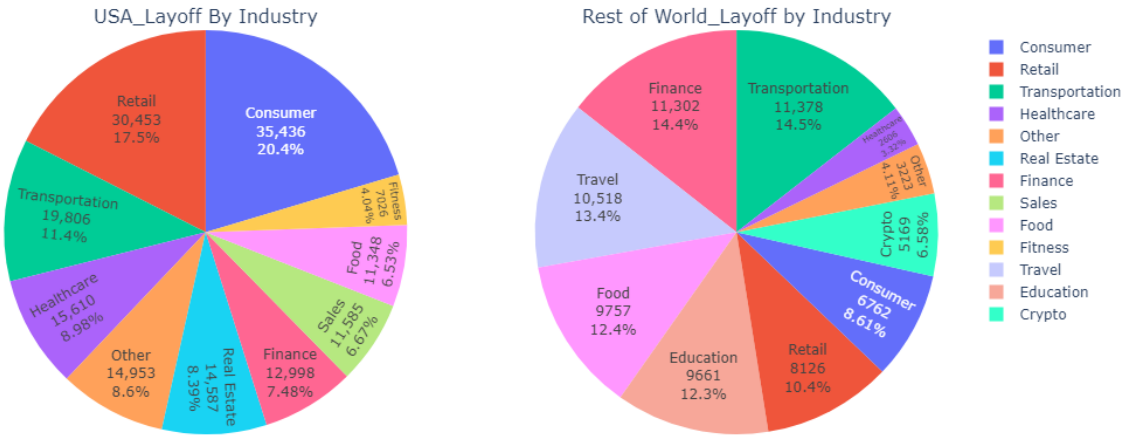

The impact of COVID-19 on the US consumer, retail and transportation market has been significant. The pandemic has resulted in widespread layoffs and closures of businesses, causing a sharp decline in consumer spending.

Retail sales have dropped significantly as people have been forced to stay home and avoid non-essential shopping. Many retailers have had to close their doors, and those that have remained open have seen a decline in foot traffic and sales. OK online sales have been increased, but they have not been enough to make up for the losses in brick-and-mortar sales.

Transportation has also been affected by the pandemic. Air travel decrease dramatically many airlines have had to cut flights and lay off employees. The decline in business travel has also affected the hotel and restaurant industries.

The pandemic has had an impact on the logistics and supply chain industries. The closure of factories and disruption of global trade has caused delays and shortages in the supply of goods. This has led to increased costs and difficulty in getting products to consumers.

Overall, the pandemic has had a significant impact on the US consumer, retail and transportation market resulting in widespread layoffs and closures of businesses. It will take time for the market to recover, and it is certain when consumer spending will return to pre pandemic levels.

For the rest of the world transportation, finance call mom travel, food, education, retail, consumer has been affected for Layoffs.

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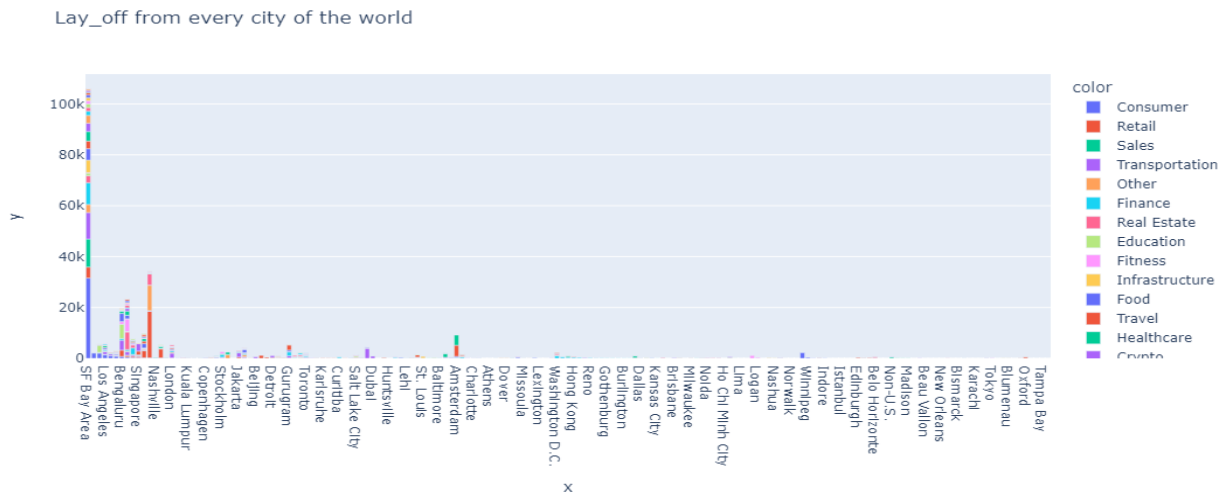
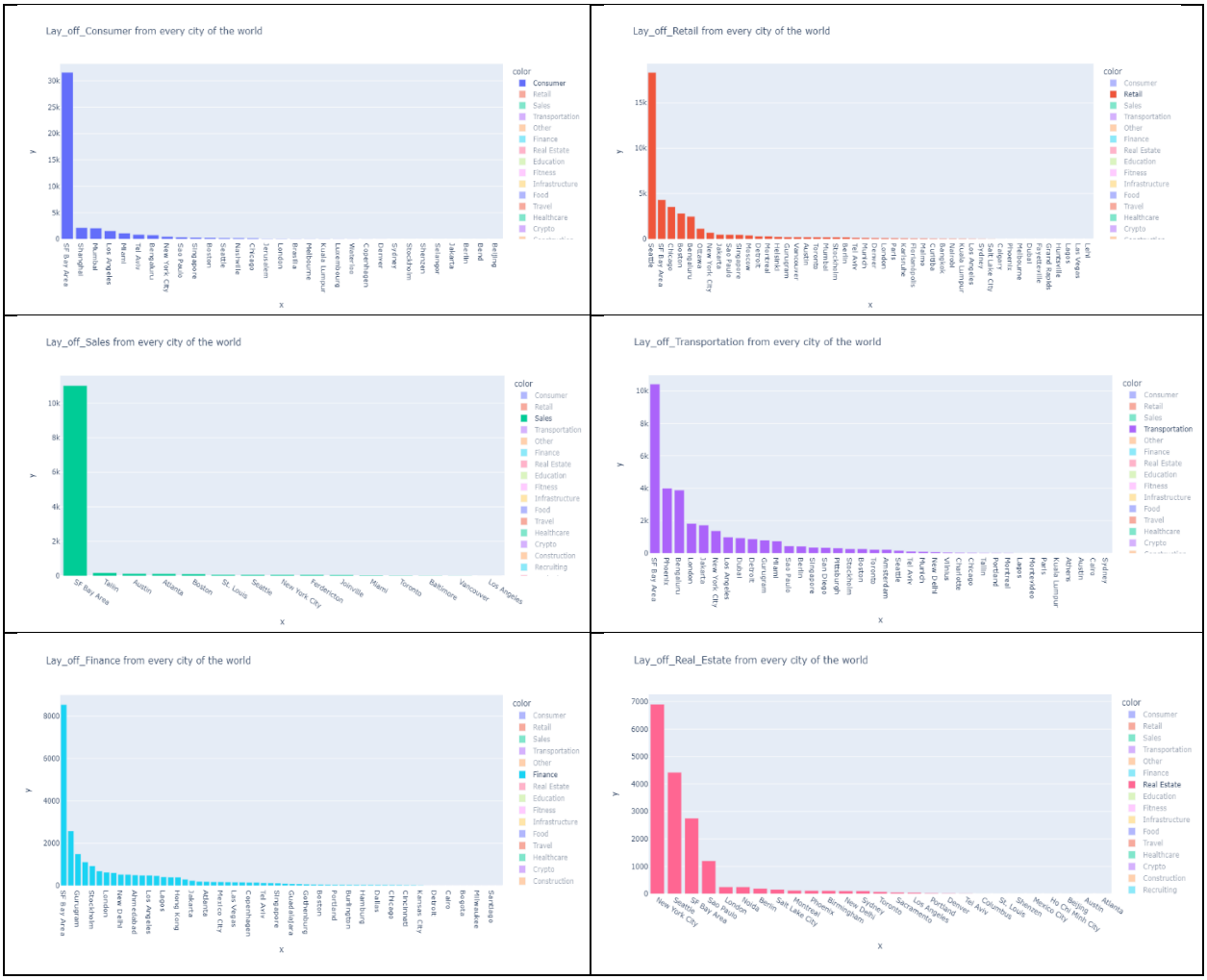
Lay_off from every city of the world.





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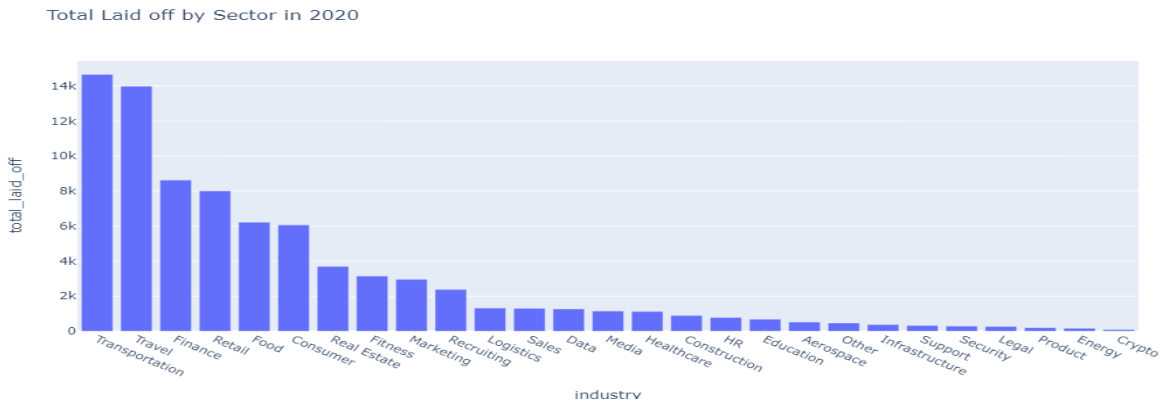
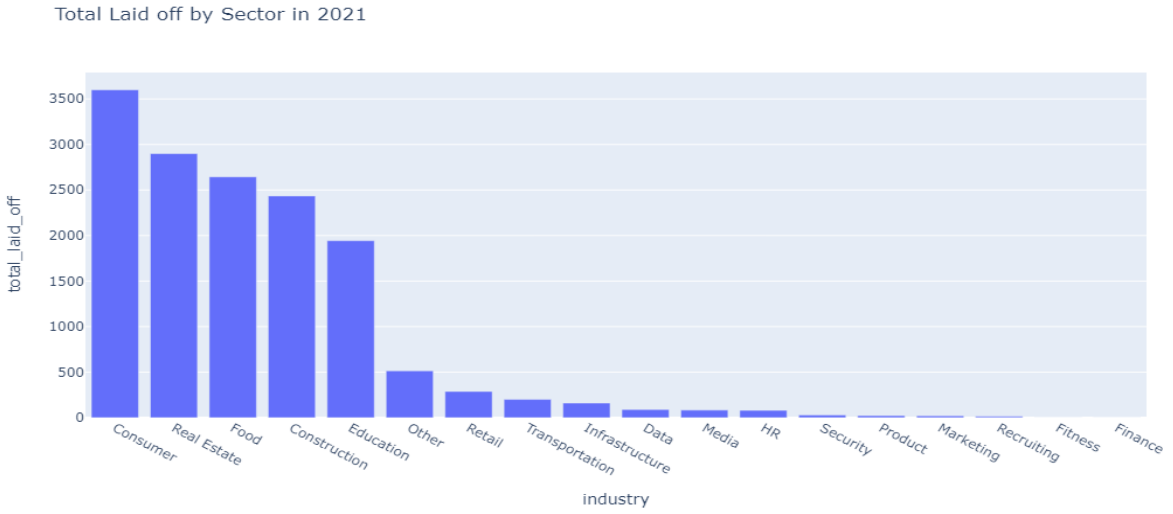
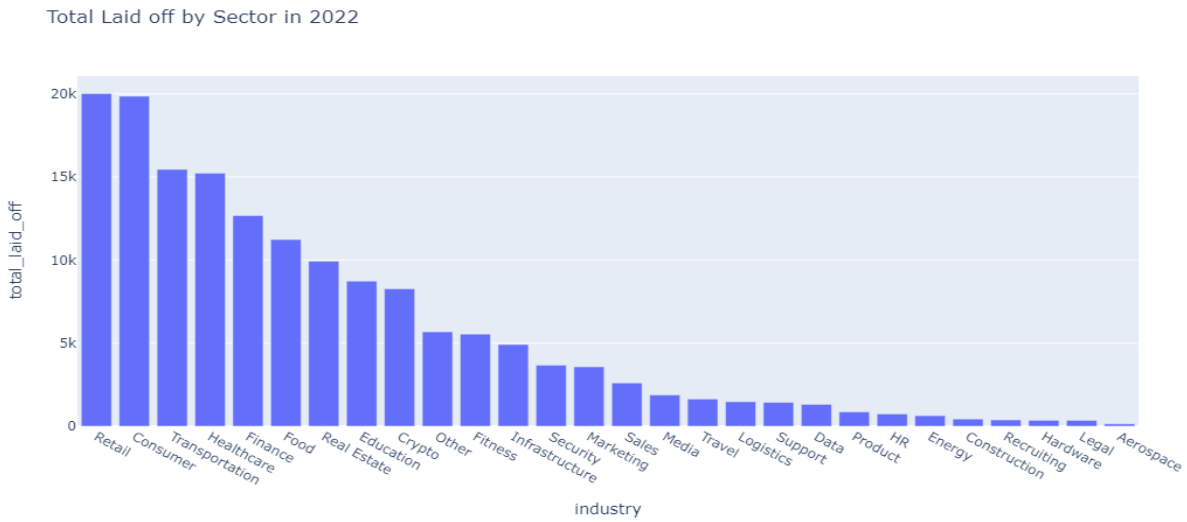
Layoff By Year:







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Few_Screenshots OF Code:

Importing the Libarary

In [167]:
```
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd
import seaborn as sns

import plotly.express as px
import plotly.graph_objects as go
from plotly.subplots import make_subplots
import plotly

import os
for dirname, _, filenames in os.walk('/kaggle/input'):
    for filename in filenames:
        print(os.path.join(dirname, filename))
```

Reading The File

In [168]:
```
data=pd.read_csv("C:/Users/viraj/Code_a/Personal_Projects_Kaggle/archive (1)/layoffs.csv")#reading the File
data1=pd.read_csv("C:/Users/viraj/Code_a/Personal_Projects_Kaggle/archive (1)/layoffs.csv")
```

In [ ]:

Cleaning and preparing the Data

In [169]:
```
data1.head()
```

Out[169]:

	company	location	industry	total_laid_off	percentage_laid_off	date	stage	country	funds_raised
0	Amazon	Seattle	Retail	8000.0	0.02	2023-01-04	IPO	United States	108.0
1	Salesforce	SF Bay Area	Sales	8000.0	0.10	2023-01-04	IPO	United States	65.0
2	Vimeo	New York City	Consumer	NaN	0.11	2023-01-04	IPO	United States	450.0
3	Harappa	New Delhi	Education	60.0	0.30	2023-01-03	Acquired	India	NaN
4	ByteDance	Shanghai	Consumer	NaN	0.10	2023-01-03	Unknown	China	9400.0

In [170]:
```
data1.isnull().sum()    #Checking the Missing Values
```

Out[170]:
```
company                 0
location                0
industry                6
total_laid_off        565
percentage_laid_off   605
date                    1
stage                   4
country                 0
funds_raised          141
dtype: int64
```

In [171]:
```
#lets fill the missing data with 0 as NAN describes that the following company have no active layoff
```

In [172]:
```
data['total_laid_off'] = data['total_laid_off'].replace(np.NaN, 0)
data['percentage_laid_off'] = data['percentage_laid_off'].replace(np.NaN, 0)
data['funds_raised'] = data['funds_raised'].replace(np.NaN, 0)
data['industry'] = data['industry'].replace(np.NaN, 0)
data['stage'] = data['stage'].replace(np.NaN, 0)
#data['date'] = data['date'].replace(np.NaN, 0)
```

In [173]:
```
data.isnull().sum()
```

Out[173]:
```
company               0
location              0
industry              0
total_laid_off        0
percentage_laid_off   0
date                  1
stage                 0
country               0
funds_raised          0
```

File Edit View Insert Cell Kernel Widgets Help — Trusted — Python 3 (ipykernel)

Run — Code

In [174]:
```
data[data['date'].isna()]  #printing which Value for Date have NAN, Now we can manually replace the DATE value.
```

Out[174]:

	company	location	industry	total_laid_off	percentage_laid_off	date	stage	country	funds_raised
1859	Homebound	SF Bay Area	Real Estate	0.0	0.0	NaN	Unknown	United States	128.0

In [175]:
```
data.loc[1859,'date']='12/20/2022'  #Replacing the NaN value of Date with a random date.
```

In [176]:
```
data.loc[[1859]] #checking the Value
```

Out[176]:

	company	location	industry	total_laid_off	percentage_laid_off	date	stage	country	funds_raised
1859	Homebound	SF Bay Area	Real Estate	0.0	0.0	12/20/2022	Unknown	United States	128.0

In [177]:
```
data[data.duplicated()]  #finding the duplicated Values
```

Out[177]:

	company	location	industry	total_laid_off	percentage_laid_off	date	stage	country	funds_raised
1003	Cazoo	London	Transportation	750.0	0.15	2022-06-07	IPO	United Kingdom	2000.0

In [178]:
```
data[data['company']=='Cazoo']
```

Out[178]:

	company	location	industry	total_laid_off	percentage_laid_off	date	stage	country	funds_raised
1002	Cazoo	London	Transportation	750.0	0.15	2022-06-07	IPO	United Kingdom	2000.0
1003	Cazoo	London	Transportation	750.0	0.15	2022-06-07	IPO	United Kingdom	2000.0

In [179]:
```
data.drop_duplicates(subset=['company'])  #To remove duplicates on specific column(s), use subset.
```

Out[179]:

	company	location	industry	total_laid_off	percentage_laid_off	date	stage	country	funds_raised
0	Amazon	Seattle	Retail	8000.0	0.02	2023-01-04	IPO	United States	108.0
1	Salesforce	SF Bay Area	Sales	8000.0	0.10	2023-01-04	IPO	United States	65.0
2	Vimeo	New York City	Consumer	0.0	0.11	2023-01-04	IPO	United States	450.0
3	Harappa	New Delhi	Education	60.0	0.30	2023-01-03	Acquired	India	0.0
4	ByteDance	Shanghai	Consumer	0.0	0.10	2023-01-03	Unknown	China	9400.0
...	...	...	...	...	...	...	...	...	...
1852	Inspirato	Denver	Travel	130.0	0.22	2020-03-16	Series C	United States	79.0
1853	Help.com	Austin	Support	16.0	1.00	2020-03-16	Seed	United States	6.0
1856	Panda Squad	SF Bay Area	Consumer	6.0	0.75	2020-03-13	Seed	United States	1.0
1857	Tamara Mellon	Los Angeles	Retail	20.0	0.40	2020-03-12	Series C	United States	90.0
1859	Homebound	SF Bay Area	Real Estate	0.0	0.00	12/20/2022	Unknown	United States	128.0

1546 rows × 9 columns

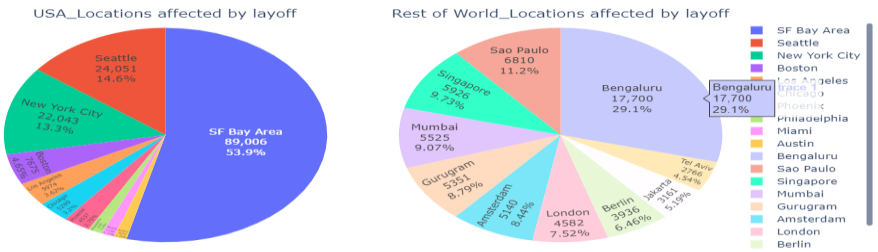
In [180]:
```
data[data['company']=='Cazoo']  #Checking if the duplicates still exist
```

Out[180]:

	company	location	industry	total_laid_off	percentage_laid_off	date	stage	country	funds_raised
1002	Cazoo	London	Transportation	750.0	0.15	2022-06-07	IPO	United Kingdom	2000.0
1003	Cazoo	London	Transportation	750.0	0.15	2022-06-07	IPO	United Kingdom	2000.0

In [181]:
```
data.info()    #final check whether any null values exist and to understand the datatypes of the column
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1860 entries, 0 to 1859
Data columns (total 9 columns):
 #   Column              Non-Null Count  Dtype
---  ------              --------------  -----
 0   company             1860 non-null   object
 1   location            1860 non-null   object
 2   industry            1860 non-null   object
 3   total_laid_off      1860 non-null   float64
 4   percentage_laid_off 1860 non-null   float64
```



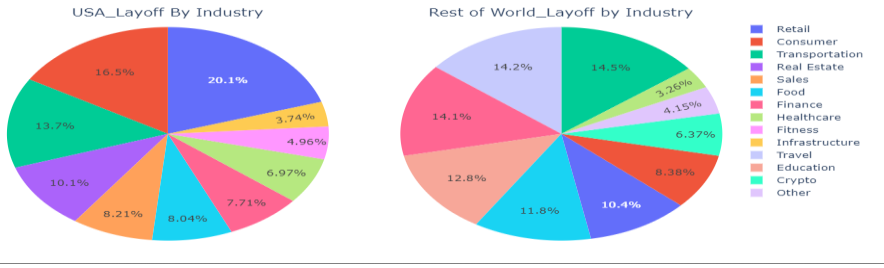
In [224]:
```
companies_7 = data_usa[['total_laid_off','industry']].sort_values(by = 'total_laid_off' , ascending = False )
companies_7_1 = data_no_usa[['total_laid_off','industry']].sort_values(by = 'total_laid_off' , ascending = False )
```

In [225]:
```
companies_8=companies_7.groupby(by='industry').sum().sort_values(by='total_laid_off',ascending=False)
companies_8_1=companies_7_1.groupby(by='industry').sum().sort_values(by='total_laid_off',ascending=False)
```

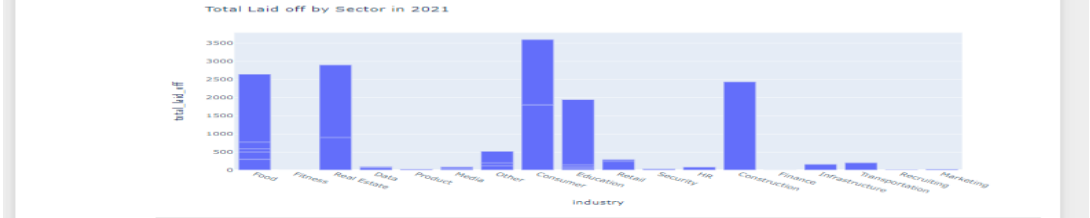
In [226]:
```
industry_8=  list(companies_8.reset_index()["industry"])[:10]
total_laid_list_8=list(companies_8.reset_index()["total_laid_off"])[:10]

industry_8_1= list(companies_8_1.reset_index()["industry"])[:10]
total_laid_list_8_1=list(companies_8_1.reset_index()["total_laid_off"])[:10]
```

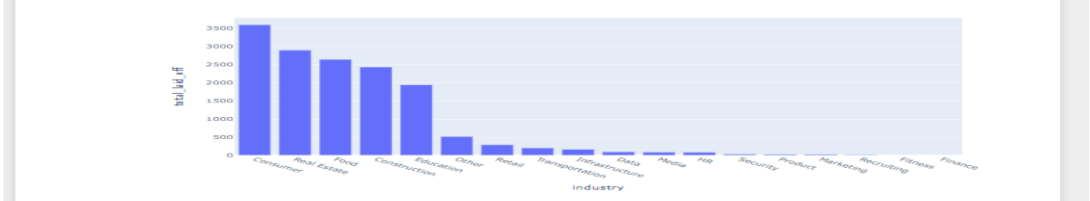
In [227]:
```
fig33 = make_subplots(rows=1, cols=2 , specs=[[ {"type": "pie"} , {"type": "pie"} ]],subplot_titles=("USA_Layoff By Industry"
fig33.add_trace(go.Pie(values=total_laid_list_8, labels=industry_8),row=1, col=1)
fig33.add_trace(go.Pie(values=total_laid_list_8_1, labels=industry_8_1),row=1, col=2)
```



In [253]:
```
#px.bar(d2_2,x='industry', y='total_laid_off')
d21_2021 = companies_1113[companies_1113['year']=="2021"][['total_laid_off','industry']]
#d21_2020
px.bar(d21_2021,x='industry', y='total_laid_off',title='Total Laid off by Sector in 2021')
```



In [270]:
```
d21_2021 = companies_1113[companies_1113['year']=="2021"][['total_laid_off','industry']]
d21_2021
#px.bar(d21_2020,x='industry', y='total_laid_off',title='Total LAid off by Sector in 2020')
d21_2021=d21_2021.groupby(by=['industry']).sum().sort_values(by = 'total_laid_off' , ascending = False )
d21_2021=d21_2021.reset_index()
px.bar(d21_2021,x='industry', y='total_laid_off',title='Total LAid off by Sector in 2021')
```



In [254]:
```
d21_2022 = companies_1113[companies_1113['year']=="2022"][['total_laid_off','industry']]
#d21_2020
px.bar(d21_2022,x='industry', y='total_laid_off',title='Total Laid off by Sector in 2022')
```