The Forbes Billionaires List dataset provides extensive data on the world's wealthiest individuals, allowing for thorough Exploratory Data Analysis (EDA) of their profiles and net worth.

Photo Kit Suman by on Unsplash

Step 1: Loading the dataset and importing the necessary libraries

In [1]:

```
import pandas as pd
import numpy as np
import plotly.express as px

df = pd.read_excel("forbes_billionaire_list_cleaned.xlsx")
```

Step 2: Overview of the Data

In [2]:

```
df.head()
```

Out[2]:

	rank	name	net_worth (in billion $)	age	country / territory	source	industry
0	1	Bernard Arnault & family	211.0	74.0	France	LVMH	Fashion & Retail
1	2	Elon Musk	180.0	51.0	United States	Tesla, SpaceX	Automotive
2	3	Jeff Bezos	114.0	59.0	United States	Amazon	Technology
3	4	Larry Ellison	107.0	78.0	United States	Oracle	Technology
4	5	Warren Buffett	106.0	92.0	United States	Berkshire Hathaway	Finance & Investments

In [3]:

```
# Rename the columns 'net_worth' and 'country' for simplicity.
df = df.rename(columns={'net_worth (in billion $)': 'net_worth', 'country / territory': 'country'})
```

In [4]:

```
df.head()
```

Out[4]:

	rank	name	net_worth	age	country	source	industry
0	1	Bernard Arnault & family	211.0	74.0	France	LVMH	Fashion & Retail
1	2	Elon Musk	180.0	51.0	United States	Tesla, SpaceX	Automotive
2	3	Jeff Bezos	114.0	59.0	United States	Amazon	Technology
3	4	Larry Ellison	107.0	78.0	United States	Oracle	Technology
4	5	Warren Buffett	106.0	92.0	United States	Berkshire Hathaway	Finance & Investments

In [5]:

```
df.dtypes
```

Out[5]:

```
rank           int64
name          object
net_worth    float64
age          float64
country       object
source        object
industry      object
dtype: object
```

In [6]:

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2655 entries, 0 to 2654
Data columns (total 7 columns):
 #   Column     Non-Null Count  Dtype  
---  ------     --------------  -----  
 0   rank       2655 non-null   int64  
 1   name       2655 non-null   object 
 2   net_worth  2655 non-null   float64
 3   age        2588 non-null   float64
 4   country    2655 non-null   object 
 5   source     2655 non-null   object 
 6   industry   2655 non-null   object 
dtypes: float64(2), int64(1), object(4)
memory usage: 145.3+ KB
```

Dealing with missing data

In [7]:

```
df.isnull().sum()
```

Out[7]:

```
rank          0
name          0
net_worth     0
age          67
country       0
source        0
industry      0
dtype: int64
```

In [8]:

```
# Dropping the missing values
df = df.dropna(subset=['age'])
```

In [9]:

```
df.isnull().sum()
```

Out[9]:

```
rank         0
name         0
net_worth    0
age          0
country      0
source       0
industry     0
dtype: int64
```

Dealing with duplicate entries

In [10]:

```
duplicates = df[df.duplicated(keep=False)]
duplicates
```

Out[10]:

	rank	name	net_worth	age	country	source	industry
2543	2540	Lu Yonghua & family	1.0	59.0	China	Electronics	Technology
2545	2540	Scott Smith	1.0	73.0	United States	Cloud computing	Technology
2550	2540	Ma Xiuhui	1.0	52.0	China	LED lighting	Manufacturing
2553	2540	Lu Yonghua & family	1.0	59.0	China	Electronics	Technology
2558	2540	Apoorva Mehta	1.0	36.0	Canada	Grocery delivery service	Technology
2561	2540	Ma Xiuhui	1.0	52.0	China	LED lighting	Manufacturing
2566	2540	George Sakellaris	1.0	76.0	United States	Energy services	Energy
2568	2540	Vera Rechulski Santo Domingo	1.0	74.0	Brazil	Beer	Food & Beverage
2573	2540	Vera Rechulski Santo Domingo	1.0	74.0	Brazil	Beer	Food & Beverage
2584	2540	Tyler Perry	1.0	53.0	United States	Movies, television	Media & Entertainment
2589	2540	Tyler Perry	1.0	53.0	United States	Movies, television	Media & Entertainment
2592	2540	Stanley Motta	1.0	77.0	Panama	Finance	Finance & Investments
2597	2540	Stanley Motta	1.0	77.0	Panama	Finance	Finance & Investments
2600	2540	Fulvio Montipò & family	1.0	78.0	Italy	Hydraulic pumps	Manufacturing
2605	2540	Fulvio Montipò & family	1.0	78.0	Italy	Hydraulic pumps	Manufacturing
2608	2540	Andrei Molchanov	1.0	51.0	Russia	Construction materials	Construction & Engineering
2614	2540	Andrei Molchanov	1.0	51.0	Russia	Construction materials	Construction & Engineering
2617	2540	Ulrike Meister	1.0	56.0	Germany	Appliances	Manufacturing
2622	2540	Ulrike Meister	1.0	56.0	Germany	Appliances	Manufacturing
2633	2540	Apoorva Mehta	1.0	36.0	Canada	Grocery delivery service	Technology
2638	2540	Neerja Sethi	1.0	68.0	United States	IT consulting, outsourcing	Technology
2640	2540	Eddy Kusnadi Sariaatmadja	1.0	69.0	Indonesia	Media, tech	Media & Entertainment
2645	2540	Eddy Kusnadi Sariaatmadja	1.0	69.0	Indonesia	Media, tech	Media & Entertainment
2647	2540	George Sakellaris	1.0	76.0	United States	Energy services	Energy
2652	2540	Scott Smith	1.0	73.0	United States	Cloud computing	Technology
2654	2540	Neerja Sethi	1.0	68.0	United States	IT consulting, outsourcing	Technology

In [11]:

```
df = df.drop_duplicates()
```

In [12]:

```
unique_names_count = df['name'].nunique()
unique_country_count = df['country'].nunique()
unique_sources_of_income = df['source'].nunique()
unique_industries = df['industry'].nunique()
print("Number of unique names:", unique_names_count)
print("Number of unique countries:", unique_country_count)
print("Number of unique sources of income:", unique_sources_of_income)
print("Number of unique industries:", unique_industries)
```

```
Number of unique names: 2573
Number of unique countries: 77
Number of unique sources of income: 893
Number of unique industries: 18
```

In [13]:

```
df.describe()
```

Out[13]:

	rank	net_worth	age
count	2575.000000	2575.000000	2575.000000
mean	1279.875728	4.679262	65.139029
std	740.114437	9.942446	13.258623
min	1.000000	1.000000	18.000000
25%	636.000000	1.500000	56.000000
50%	1272.000000	2.400000	65.000000
75%	1905.000000	4.300000	75.000000
max	2540.000000	211.000000	101.000000

The Forbes Billionaires have a wide age range, from 18 to 101, with a mean age of 65. The richest billionaire has a net worth of 211 billion, while the "poorest" has only 1 billion.

In [14]:

```
# Find the youngest billionaires
youngest_billionaire_data = df[df['age'] == df['age'].min()]
youngest_billionaire_data
```

Out[14]:

	rank	name	net_worth	age	country	source	industry
827	818	Clemente Del Vecchio	3.5	18.0	Italy	Eyeglases	Fashion & Retail

After a quick google search we can find that Clemente Del Vecchio, one of Leonardo Del Vecchio's children, who was only 18 at the time of his father's death, inherited a 12.5% stake in Vecchio's holding company Delfin, based in Luxembourg, as per Forbes. After inheriting his stake in his father's fortune in 2022, Clemente became the world's youngest billionaire at the age of just 18.

Under Leonardo's leadership, the eyewear giant acquired Sunglass Hut, Ray-Ban and Oakley and grew to make glasses for virtually every brand including Bulgari and Chanel. As per *The Sun*, the world's youngest billionaire, Clemente holds a low profile and does not have any direct involvement in his father's companies.

Source: https://www.indiatimes.com/worth/news/18-year-old-clemente-del-vecchio-worlds-youngest-billionaire-607286.html (https://www.indiatimes.com/worth/news/18-year-old-clemente-del-vecchio-worlds-youngest-billionaire-607286.html)

In [15]:

```
# Find the oldest billionaires
oldest_billionaire_data = df[df['age'] == df['age'].max()]
oldest_billionaire_data
```

Out[15]:

	rank	name	net_worth	age	country	source	industry
2143	2133	George Joseph	1.3	101.0	United States	Insurance	Finance & Investments

After a quick google search we can find that Mercury General, an insurance provider generating annual revenues of 3.5 billion, was established by George Joseph. Commencing its journey in 1962, Mercury General was founded with 2 million in capital and targeted cost-effective offers for drivers considered safer than the norm.

George Joseph, having experienced the challenges of the Great Depression, served as a flight navigator in World War II. Graduating in 1949 from Harvard, where he majored in mathematics and physics, Joseph holds a 34% stake in the publicly-traded insurance company. Notably, he holds the distinction of being America's most senior billionaire.

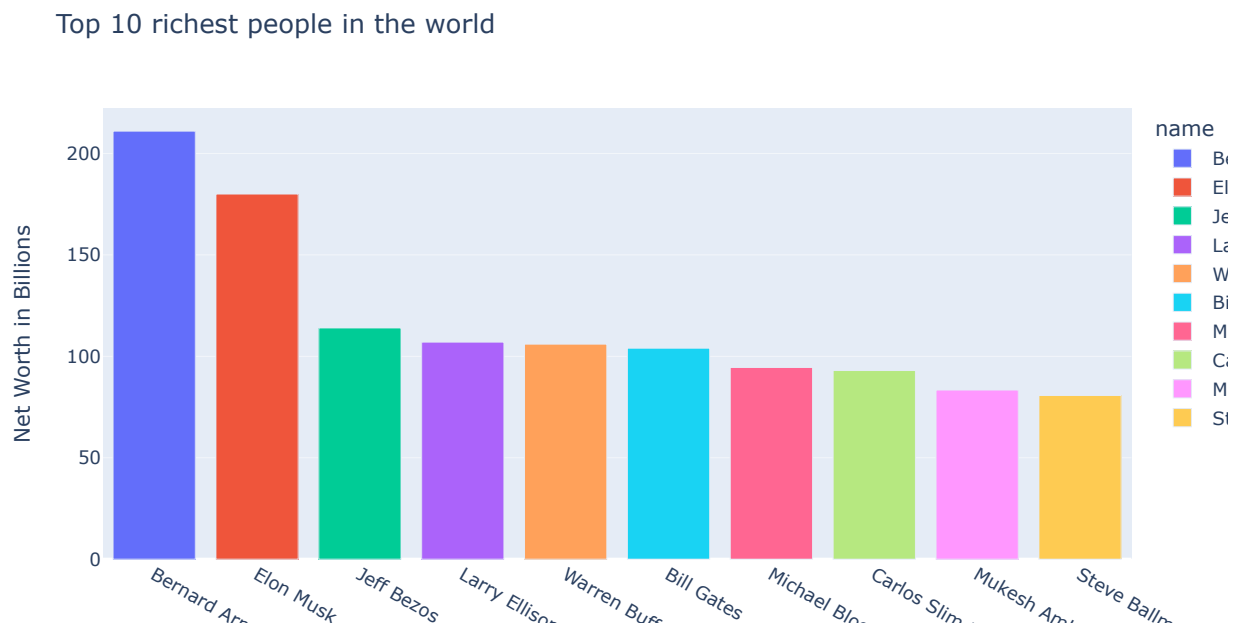
Source: https://www.forbes.com/profile/george-joseph/?sh=79baa1214d54 (https://www.forbes.com/profile/george-joseph/?sh=79baa1214d54)

Step 3: Visualizations

Top 10 richest people in the world

In [16]:

```
fig = px.bar(df.head(10), x='name', y='net_worth', title='Top 10 richest people in the world', color='name',)
fig.update_yaxes(title="Net Worth in Billions")
fig.update_xaxes(title="Name")
fig.show()
```

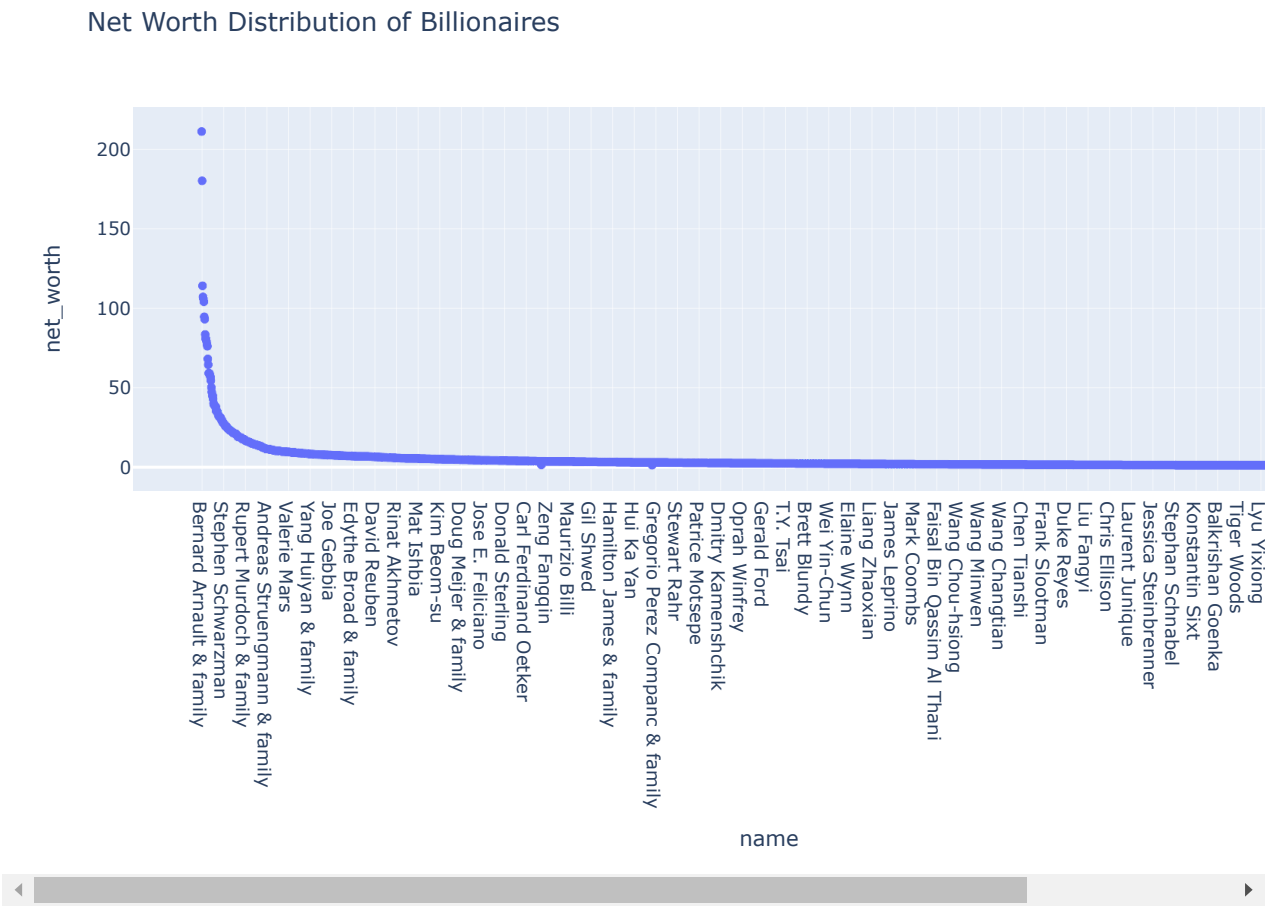


Upon examining the dataset, it is evident that four out of the top ten wealthiest individuals, Jeff Bezos, Larry Ellison, Bill Gates and Steve Ballmer, work in the technology industry.

A Scatter Plot Analysis

In [17]:

```
fig = px.scatter(df, x='name', y='net_worth', title='Net Worth Distribution of Billionaires')
fig.update_layout(width=1000, height=600)
fig.show()
```

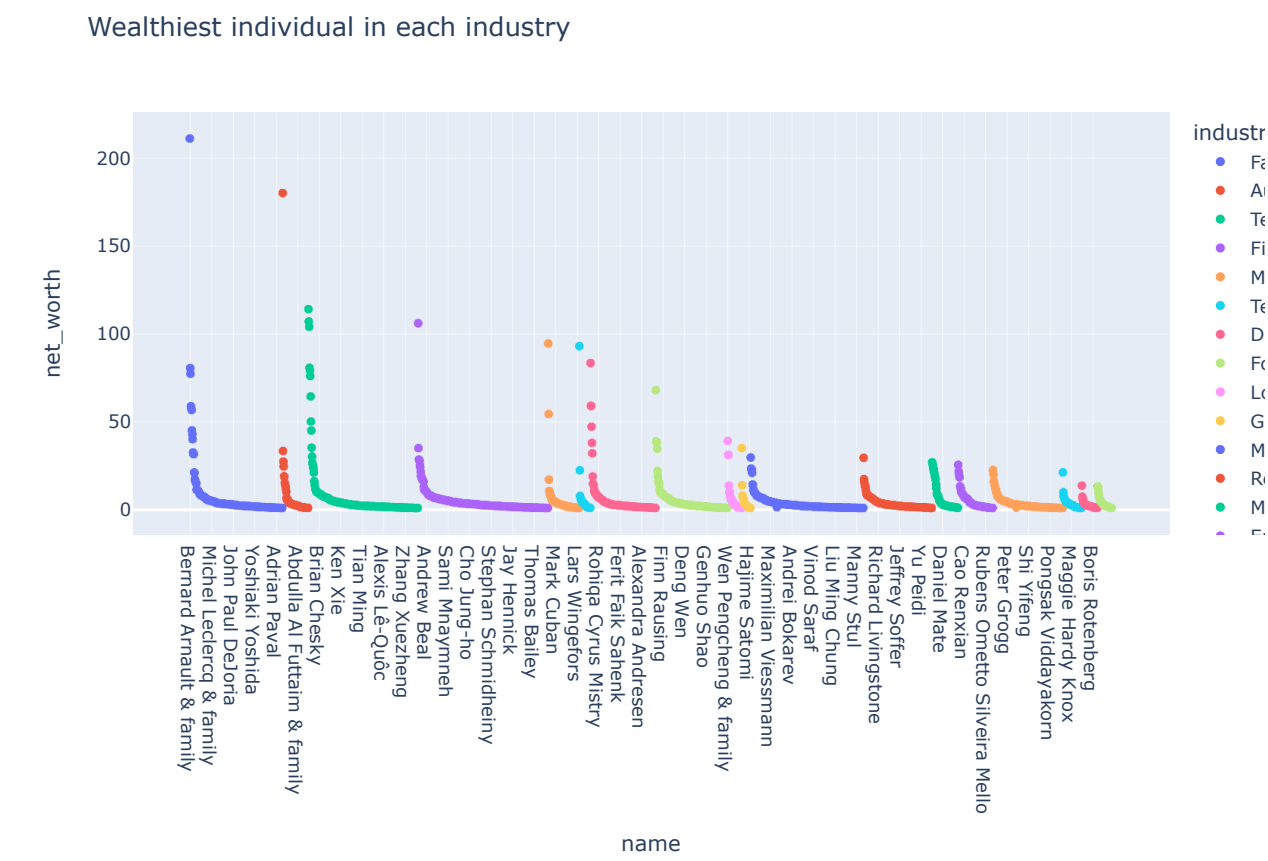


It appears that there is a sudden increase in net worth.

Global Billionaire Landscape: Wealth Distribution across Industries

In [18]:

```
fig = px.scatter(df, x='name', y='net_worth', color='industry', title='Wealthiest individual in each industry')
fig.update_layout(width=1000, height=600)
fig.show()
```



We can zoom in and identify the wealthiest individuals in each industry.

Top 10 Countries Leading the Billionaire Landscape

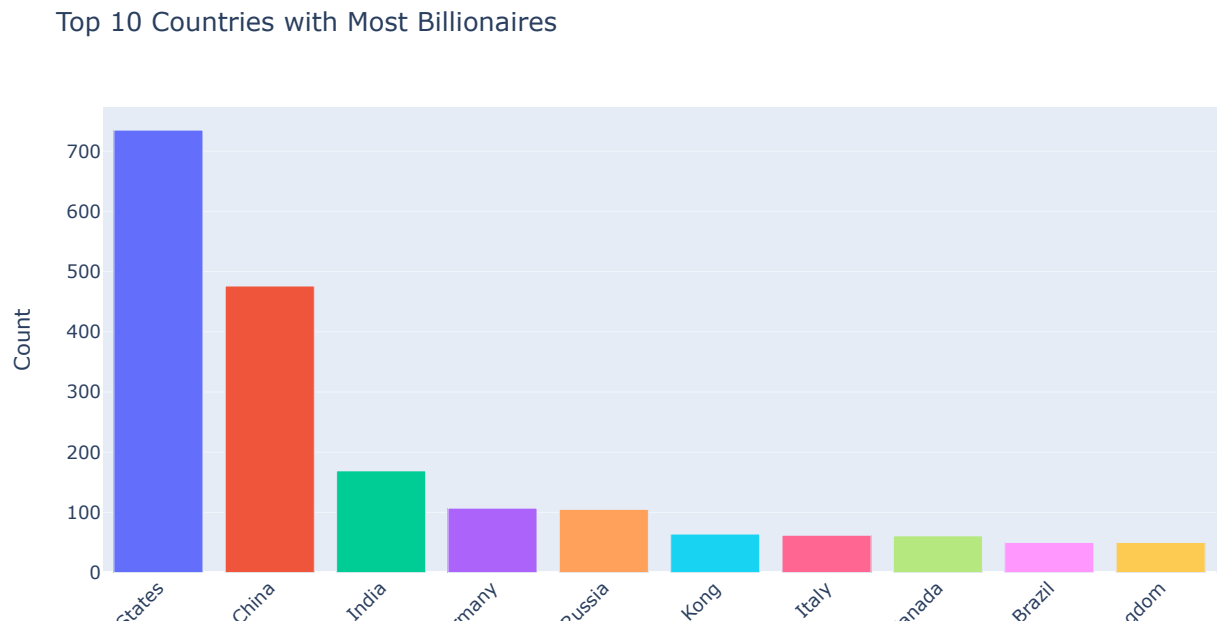
In [19]:

```
# Top 10 Countries with the most number of billinores
top_countries = df['country'].value_counts().head(10)
print(top_countries)
```

```
country
United States     735
China             476
India             169
Germany           107
Russia            105
Hong Kong          64
Italy              62
Canada             61
Brazil             50
United Kingdom     50
Name: count, dtype: int64
```

In [20]:

```
top_countries_df = top_countries.reset_index()
top_countries_df.columns = ['Country', 'Count']
fig = px.bar(top_countries_df, x='Country', y='Count', title='Top 10 Countries with Most Billionaires', color='Country')
fig.update_layout(xaxis_tickangle=-45)
fig.show()
```



Countries with the fewest number of billionaires

In [21]:

```
countries = df['country'].value_counts().tail(20)
print(countries)
```

```
country
Oman                    2
Georgia                 2
Estonia                 1
Barbados                1
St. Kitts and Nevis     1
Armenia                 1
Tanzania                1
Bangladesh              1
Macau                   1
Algeria                 1
Nepal                   1
Venezuela               1
Zimbabwe                1
Guernsey                1
Liechtenstein           1
Iceland                 1
Eswatini (Swaziland)    1
Belize                  1
Portugal                1
Panama                  1
Name: count, dtype: int64
```

We have 4 countries in Africa, 6 in Asia, 7 in Europe, 4 in North America, and 1 in South America.

Leading Industries by Billionaire Presence: Top 10 Industries with the Highest Count

In [22]:

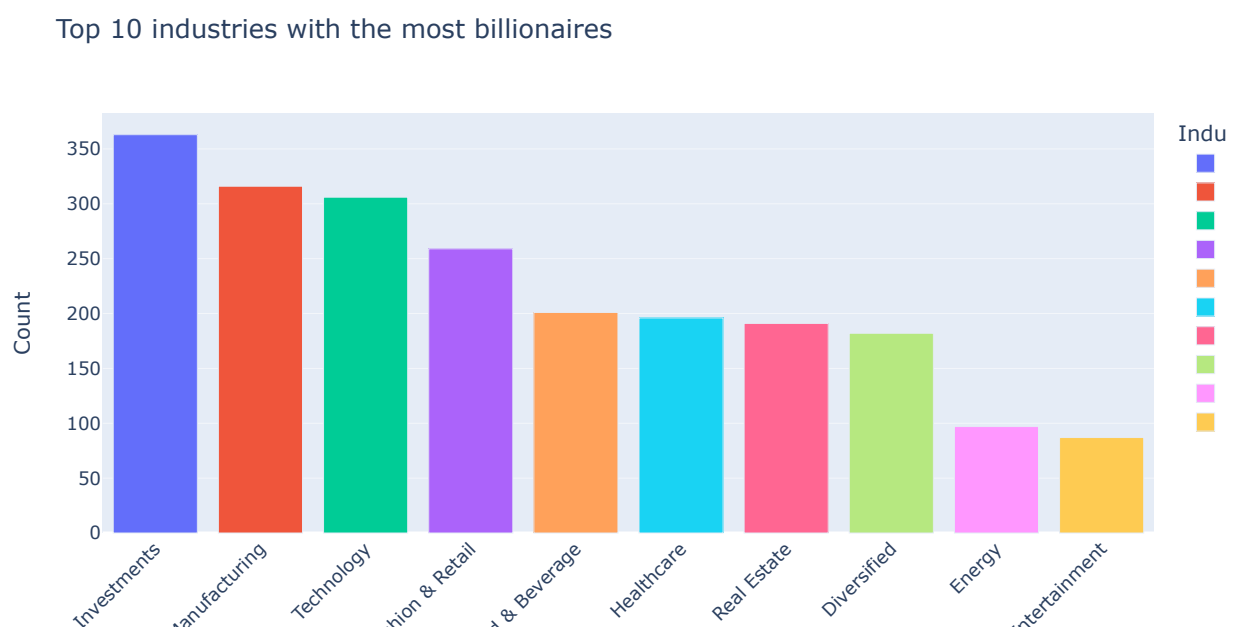
```
# Top 10 industried with the most number of billinores
top_industries = df['industry'].value_counts().head(10)
print(top_industries)
```

```
industry
Finance & Investments    363
Manufacturing            316
Technology               306
Fashion & Retail         259
Food & Beverage          201
Healthcare               196
Real Estate              191
Diversified              182
Energy                    97
Media & Entertainment     87
Name: count, dtype: int64
```

In [23]:

```
top_industries_df = top_industries.reset_index()
top_industries_df.columns = ['Industry', 'Count']

fig = px.bar(top_industries_df, x='Industry', y='Count', title='Top 10 industries with the most billionaires', color='Inc
fig.update_layout(xaxis_tickangle=-45)
fig.show()
```



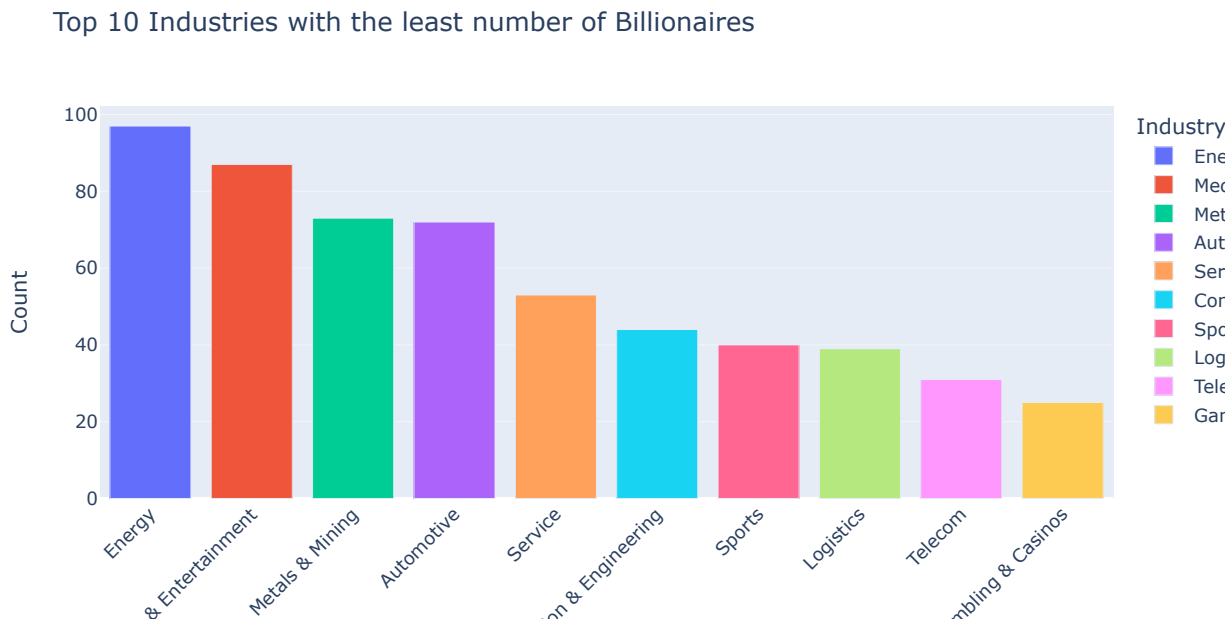
A significant number of billionaires have accumulated their wealth through finance and investment endeavors.

Exploring the Rarest Billionaire-Favored Industries: Top 10 Industries with the Fewest Billionaires

In [24]:

```
# Top 10 industried with the least number of billinores
industries = df['industry'].value_counts().tail(10)
industries_df = industries.reset_index()
industries_df.columns = ['Industry', 'Count']

fig = px.bar(industries_df, x='Industry', y='Count', title='Top 10 Industries with the least number of Billionaires', col
fig.update_layout(xaxis_tickangle=-45)
fig.show()
```

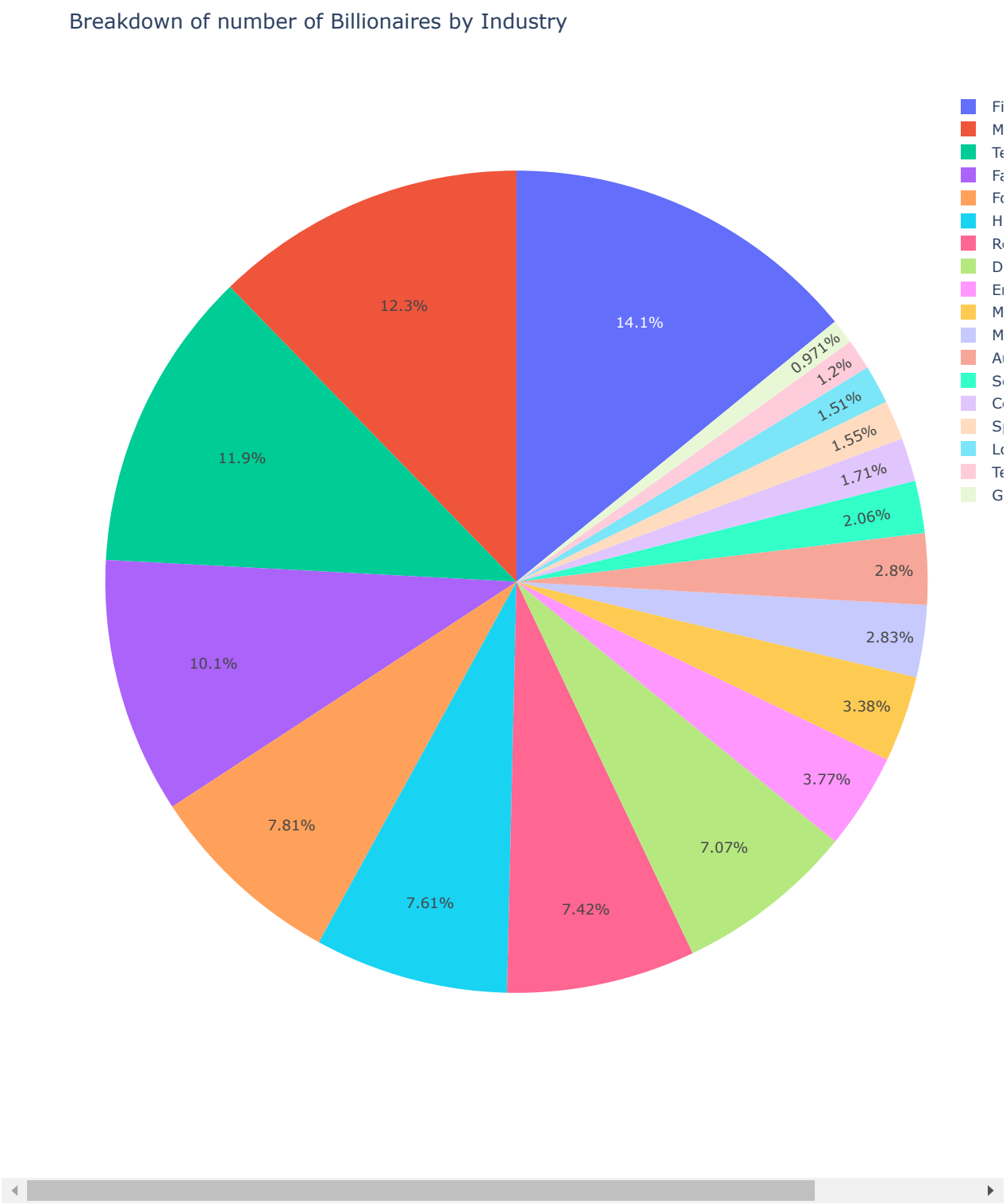


Industry Distribution of Billionaires: A Pie Chart Analysis

In [25]:

```
# Pie chart for the number of billionaires per industry
industry_counts = df['industry'].value_counts()

fig = px.pie(industry_counts, names=industry_counts.index, values=industry_counts.values, title='Breakdown of number of B
fig.update_layout(width=1000, height=1000)
fig.show()
```



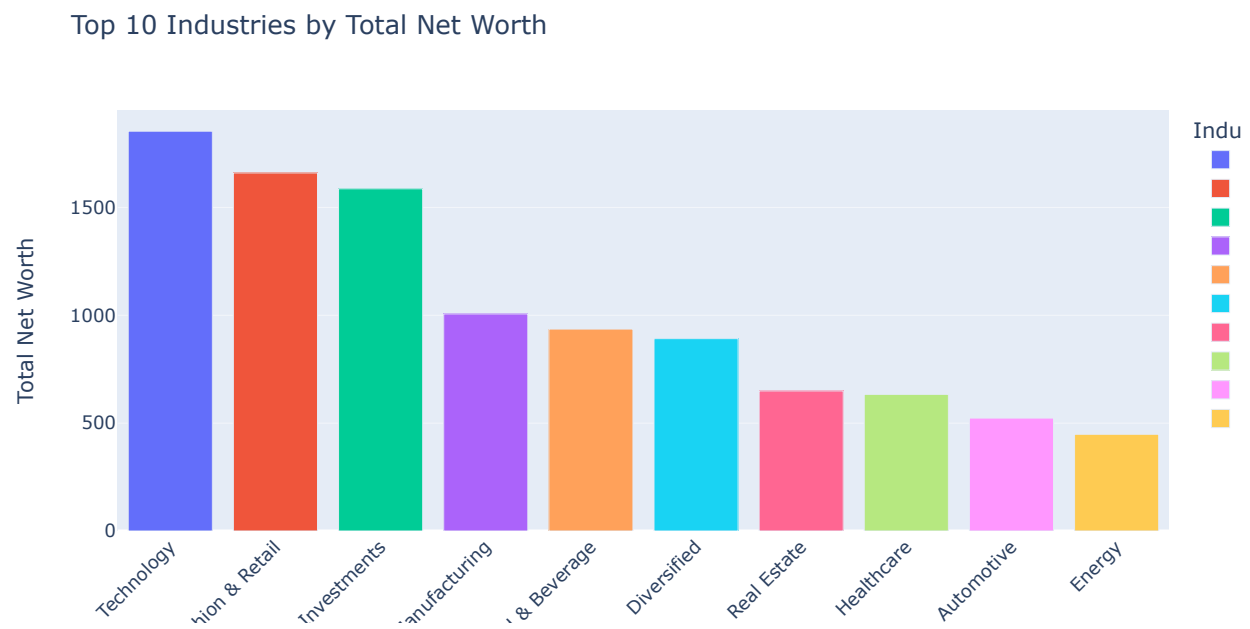
Top 10 Industries by Total Net Worth: A Visual Analysis of Wealth Distribution

In [26]:

```
# Top 10 industries with the highest net worth
top_industries = df.groupby('industry')['net_worth'].sum().sort_values(ascending=False).head(10)

top_industries_df = top_industries.reset_index()
top_industries_df.columns = ['Industry', 'Total Net Worth']

fig = px.bar(top_industries_df, x='Industry', y='Total Net Worth', title='Top 10 Industries by Total Net Worth', color='I
fig.update_layout(xaxis_tickangle=-45)
fig.show()
```



Top Indian Billionaires: Wealth and Profile Overview

In [27]:

```
indian_billionaires = df[df['country'] == 'India']
indian_billionaires.head()
```

Out[27]:

	rank	name	net_worth	age	country	source	industry
8	9	Mukesh Ambani	83.4	65.0	India	Diversified	Diversified
23	24	Gautam Adani	47.2	60.0	India	Infrastructure, commodities	Diversified
54	55	Shiv Nadar	25.6	77.0	India	Software services	Technology
67	68	Cyrus Poonawalla	22.6	81.0	India	Vaccines	Healthcare
92	93	Lakshmi Mittal	17.7	72.0	India	Steel	Metals & Mining

In [28]:

```
indian_billionaires.size
```

Out[28]:

```
1183
```

In [29]:

```
indian_billionaires.describe()
```

Out[29]:

	rank	net_worth	age
count	169.000000	169.000000	169.000000
mean	1387.627219	3.992899	68.236686
std	699.405604	7.923718	11.243128
min	9.000000	1.000000	36.000000
25%	905.000000	1.400000	63.000000
50%	1434.000000	2.100000	68.000000
75%	2020.000000	3.200000	75.000000
max	2540.000000	83.400000	99.000000

The youngest Indian billionaire is 36 years old while the oldest is 99 years old, with an average age of 68.

In [30]:

```
youngest_billionaire_india = indian_billionaires[indian_billionaires['age'] == indian_billionaires['age'].min()]
youngest_billionaire_india
```

Out[30]:

	rank	name	net_worth	age	country	source	industry
2415	2405	Nikhil Kamath	1.1	36.0	India	Financial services	Finance & Investments

Nikhil Kamath (born September 5, 1986) is an Indian entrepreneur. He is the co-founder of Zerodha, a retail stockbroker and True Beacon, an asset management company.

Source: https://en.wikipedia.org/wiki/Nikhil_Kamath (https://en.wikipedia.org/wiki/Nikhil_Kamath)

In [31]:

```
oldest_billionaire_india = indian_billionaires[indian_billionaires['age'] == indian_billionaires['age'].max()]
oldest_billionaire_india
```

Out[31]:

	rank	name	net_worth	age	country	source	industry
2322	2259	Keshub Mahindra	1.2	99.0	India	Diversified	Diversified

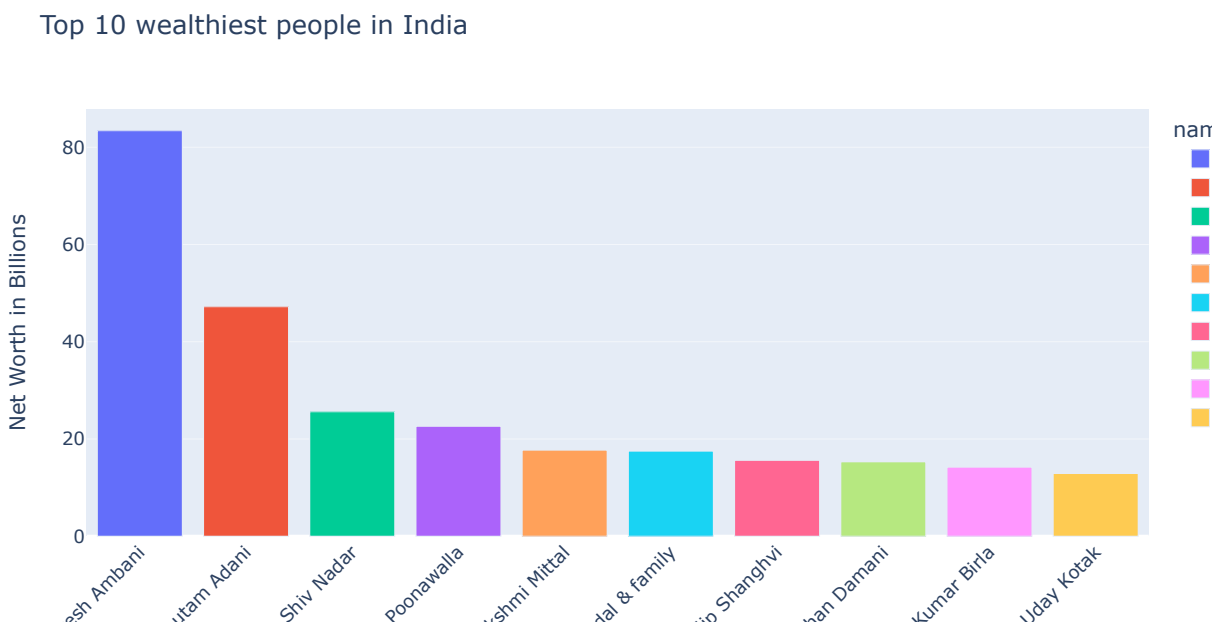
Keshub Mahindra was chairman emeritus of the $16.4 billion (revenue) Mumbai-listed conglomerate Mahindra & Mahindra. He died in April 2023 at age 99. He joined his father's company in 1947, became chairman in 1963 and stepped down in 2012, ceding the spot to his billionaire nephew, Anand Mahindra.

Source: https://www.forbes.com/profile/keshub-mahindra/?sh=1ce7bfd721f2 (https://www.forbes.com/profile/keshub-mahindra/?sh=1ce7bfd721f2)

Top 10 Wealthiest Individuals in India by Net Worth

In [32]:

```
fig = px.bar(indian_billionaires.head(10), x='name', y='net_worth', title='Top 10 wealthiest people in India', color='nam
fig.update_yaxes(title="Net Worth in Billions")
fig.update_xaxes(title="Name")
fig.update_layout(xaxis_tickangle=-45)
fig.show()
```



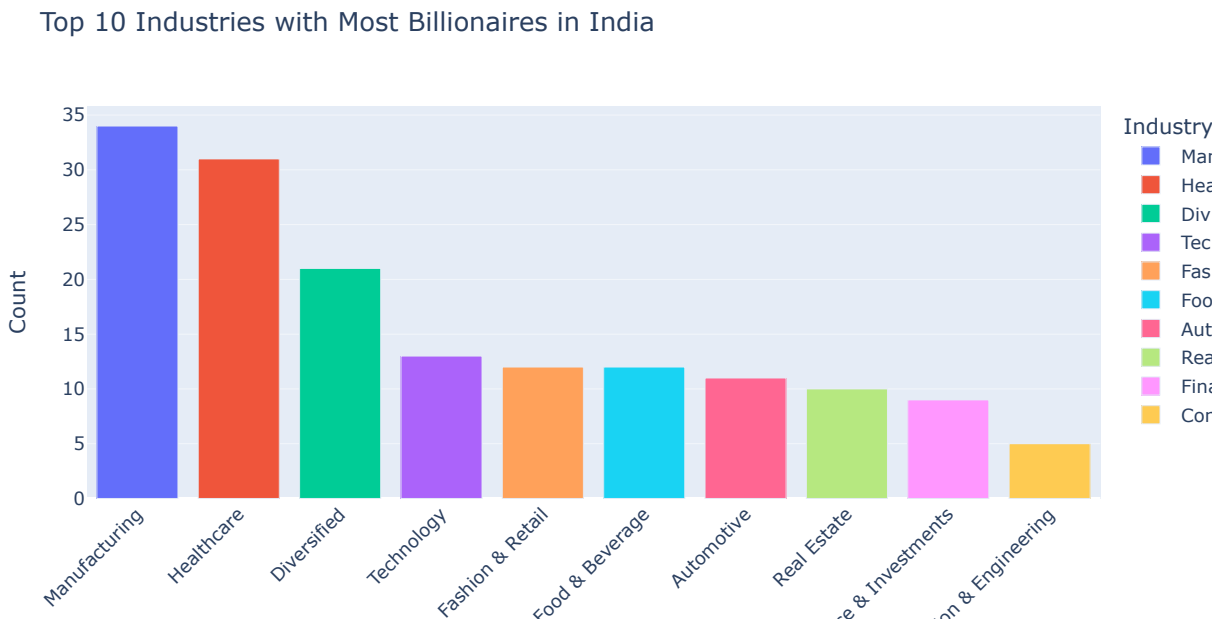
Mukesh Ambani, the richest person in India, is the ninth richest person in the world.

Charting the Leading Industries with the Most Billionaires in India

In [33]:

```
# Top industries with most Billionaires in India
top_industries_india = indian_billionaires['industry'].value_counts().head(10)
top_industries_india_df = top_industries_india.reset_index()
top_industries_india_df.columns = ['Industry', 'Count']

fig = px.bar(top_industries_india_df, x='Industry', y='Count', title='Top 10 Industries with Most Billionaires in India',
fig.update_layout(xaxis_tickangle=-45)
fig.show()
```



Most Indian Billionaires made their fortune from the Manufacturing industry

Leading Sources of Wealth Among India's Billionaires: A Top 10 Overview

In [34]:

```
# Top sources of income with most Billionaires in India
top_industries_india = indian_billionaires['source'].value_counts().head(10)
top_industries_india_df = top_industries_india.reset_index()
top_industries_india_df.columns = ['Source', 'Count']

fig = px.bar(top_industries_india_df, x='Source', y='Count', title='Top 10 sources of income with Most Billionaires in In
fig.update_layout(xaxis_tickangle=-45)
fig.show()
```