```
import pandas as pd
df = pd.read_csv('https://raw.githubusercontent.com/psabhay2003/BCGX-GenAI/refs/heads/main/10K.csv')
df
```

	Company	Year	Total Revenue	Net Income	Total Assets	Total Liabilities	Cash Flow
0	Microsoft	2024	2.451220e+11	8.813600e+10	5.121630e+11	2.436860e+11	1.185480e+11
1	Microsoft	2023	2.119150e+11	7.231600e+10	4.119760e+11	2.057530e+11	8.758200e+10
2	Microsoft	2022	1.982700e+11	7.273800e+10	3.648400e+11	1.982980e+11	8.903500e+10
3	Tesla	2024	9.769000e+10	7.153000e+09	1.220700e+11	4.839000e+10	1.492300e+10
4	Tesla	2023	9.677300e+10	1.497400e+10	1.066180e+11	4.300900e+10	1.325600e+10
5	Tesla	2022	8.146200e+10	1.258700e+10	8.233800e+10	3.644000e+10	1.472400e+10
6	Apple	2024	3.910350e+11	9.373600e+10	3.649800e+11	3.080300e+11	1.182540e+11
7	Apple	2023	3.832850e+11	9.699500e+10	3.525830e+11	2.904370e+11	1.105430e+11
8	Apple	2022	3.943280e+11	9.980300e+10	3.527550e+11	3.020830e+11	1.221510e+11

Next steps: Generate code with df | View recommended plots | New interactive sheet

```
# Convert all numerical columns to standard number format (removing scientific notation)
pd.options.display.float_format = '{:.0f}'.format
df
```

	Company	Year	Total Revenue	Net Income	Total Assets	Total Liabilities	Cash Flow
0	Microsoft	2024	245122000000	88136000000	512163000000	243686000000	118548000000
1	Microsoft	2023	211915000000	72316000000	411976000000	205753000000	87582000000
2	Microsoft	2022	198270000000	72738000000	364840000000	198298000000	89035000000
3	Tesla	2024	97690000000	7153000000	122070000000	48390000000	14923000000
4	Tesla	2023	96773000000	14974000000	106618000000	43009000000	13256000000
5	Tesla	2022	81462000000	12587000000	82338000000	36440000000	14724000000
6	Apple	2024	391035000000	93736000000	364980000000	308030000000	118254000000
7	Apple	2023	383285000000	96995000000	352583000000	290437000000	110543000000
8	Apple	2022	394328000000	99803000000	352755000000	302083000000	122151000000

Next steps: Generate code with df | View recommended plots | New interactive sheet

```
df.describe()
```

	Year	Total Revenue	Net Income	Total Assets	Total Liabilities	Cash Flow
count	9	9	9	9	9	9
mean	2023	233320000000	62048666667	296702555556	186236222222	76557333333
std	1	130006968331	39094383970	153240424606	114506220759	48272769855
min	2022	81462000000	7153000000	82338000000	36440000000	13256000000
25%	2022	97690000000	14974000000	122070000000	48390000000	14923000000
50%	2023	211915000000	72738000000	352755000000	205753000000	89035000000
75%	2024	383285000000	93736000000	364980000000	290437000000	118254000000
max	2024	394328000000	99803000000	512163000000	308030000000	122151000000

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 9 entries, 8 to 3
Data columns (total 7 columns):
 #   Column             Non-Null Count  Dtype
---  ------             --------------  -----
 0   Company            9 non-null      object
 1   Year               9 non-null      int64
 2   Total Revenue      9 non-null      float64
 3   Net Income         9 non-null      float64
 4   Total Assets       9 non-null      float64
 5   Total Liabilities  9 non-null      float64
 6   Cash Flow          9 non-null      float64
```

```
dtypes: float64(5), int64(1), object(1)
memory usage: 576.0+ bytes
```

```
df = df.sort_values(['Company','Year'],ascending=True).groupby('Company').head()
df
```

	Company	Year	Total Revenue	Net Income	Total Assets	Total Liabilities	Cash Flow
8	Apple	2022	394328000000	99803000000	352755000000	302083000000	122151000000
7	Apple	2023	383285000000	96995000000	352583000000	290437000000	110543000000
6	Apple	2024	391035000000	93736000000	364980000000	308030000000	118254000000
2	Microsoft	2022	198270000000	72738000000	364840000000	198298000000	89035000000
1	Microsoft	2023	211915000000	72316000000	411976000000	205753000000	87582000000
0	Microsoft	2024	245122000000	88136000000	512163000000	243686000000	118548000000
5	Tesla	2022	81462000000	12587000000	82338000000	36440000000	14724000000
4	Tesla	2023	96773000000	14974000000	106618000000	43009000000	13256000000
3	Tesla	2024	97690000000	7153000000	122070000000	48390000000	14923000000

Next steps: Generate code with df | View recommended plots | New interactive sheet

```
revenue = pd.DataFrame(columns=['Company','Year', 'Total Revenue'])
revenue['Company'] = df['Company']
revenue['Year'] = df['Year']
revenue['Total Revenue'] = df['Total Revenue']
revenue['Revenue Growth (%)'] = df.groupby(['Company'])['Total Revenue'].pct_change() * 100
revenue
Revenue_Growth = revenue['Revenue Growth (%)']
df = pd.concat([df, Revenue_Growth], axis=1)
df
#Microsoft and Tesla reported a net positive revenue growth whereas Apple reported a dip of 1% in revenue in the three fiscal years.
#Microsoft reported more than double revenue growth from 2023-24 whereas Tesla reported a massive revenue growth of 19% in 2023.
```

	Company	Year	Total Revenue	Net Income	Total Assets	Total Liabilities	Cash Flow	Revenue Growth (%)
8	Apple	2022	394328000000	99803000000	352755000000	302083000000	122151000000	NaN
7	Apple	2023	383285000000	96995000000	352583000000	290437000000	110543000000	-3
6	Apple	2024	391035000000	93736000000	364980000000	308030000000	118254000000	2
2	Microsoft	2022	198270000000	72738000000	364840000000	198298000000	89035000000	NaN
1	Microsoft	2023	211915000000	72316000000	411976000000	205753000000	87582000000	7
0	Microsoft	2024	245122000000	88136000000	512163000000	243686000000	118548000000	16
5	Tesla	2022	81462000000	12587000000	82338000000	36440000000	14724000000	NaN
4	Tesla	2023	96773000000	14974000000	106618000000	43009000000	13256000000	19
3	Tesla	2024	97690000000	7153000000	122070000000	48390000000	14923000000	1

Next steps: Generate code with df | View recommended plots | New interactive sheet

```
income = pd.DataFrame(columns=['Company','Year','Net Income','Net Income Growth (%)'])
income['Company'] = df['Company']
income['Year'] = df['Year']
income['Net Income'] = df['Net Income']
income['Net Income Growth (%)'] = df.groupby(['Company'])['Net Income'].pct_change() * 100
income
Net_Income_Growth = income['Net Income Growth (%)']
df = pd.concat([df, Net_Income_Growth], axis=1)
df
#Apple reported a net decrease of 6% in net income from 2022-24, Microsoft reported a net increase of 21% in net income from 2022-24 show
#Tesla reported a massive dip of a net 33% decrease in income from 2022-24.
```

	Company	Year	Total Revenue	Net Income	Total Assets	Total Liabilities	Cash Flow	Revenue Growth (%)	Net Income Growth (%)
8	Apple	2022	394328000000	99803000000	352755000000	302083000000	122151000000	NaN	NaN
7	Apple	2023	383285000000	96995000000	352583000000	290437000000	110543000000	-3	-3
6	Apple	2024	391035000000	93736000000	364980000000	308030000000	118254000000	2	-3
2	Microsoft	2022	198270000000	72738000000	364840000000	198298000000	89035000000	NaN	NaN
1	Microsoft	2023	211915000000	72316000000	411976000000	205753000000	87582000000	7	-1
0	Microsoft	2024	245122000000	88136000000	512163000000	243686000000	118548000000	16	22
5	Tesla	2022	81462000000	12587000000	82338000000	36440000000	14724000000	NaN	NaN
4	Tesla	2023	96773000000	14974000000	106618000000	43009000000	13256000000	19	19

Next steps: Generate code with df | View recommended plots | New interactive sheet

```
assets = pd.DataFrame(columns=['Company','Year','Total Assets','Total Assets Growth (%)'])
assets['Company'] = df['Company']
assets['Year'] = df['Year']
assets['Total Assets'] = df['Total Assets']
assets['Total Assets Growth (%)'] = df.groupby(['Company'])['Total Assets'].pct_change() * 100
assets
Total_Assets_Growth = assets['Total Assets Growth (%)']
df = pd.concat([df, Total_Assets_Growth], axis=1)
df
#Apple, Microsoft, and Tesla reported a net increase of 4%, 37%, 43% respectively in Total Assets Growth from 2022-2024.
```

	Company	Year	Total Revenue	Net Income	Total Assets	Total Liabilities	Cash Flow	Revenue Growth (%)	Net Income Growth (%)	Total Assets Growth (%)
8	Apple	2022	394328000000	99803000000	352755000000	302083000000	122151000000	NaN	NaN	NaN
7	Apple	2023	383285000000	96995000000	352583000000	290437000000	110543000000	-3	-3	-0
6	Apple	2024	391035000000	93736000000	364980000000	308030000000	118254000000	2	-3	4
2	Microsoft	2022	198270000000	72738000000	364840000000	198298000000	89035000000	NaN	NaN	NaN
1	Microsoft	2023	211915000000	72316000000	411976000000	205753000000	87582000000	7	-1	13
0	Microsoft	2024	245122000000	88136000000	512163000000	243686000000	118548000000	16	22	24
5	Tesla	2022	81462000000	12587000000	82338000000	36440000000	14724000000	NaN	NaN	NaN
4	Tesla	2023	96773000000	14974000000	106618000000	43009000000	13256000000	19	19	29

Next steps: Generate code with df | View recommended plots | New interactive sheet

```
liability = pd.DataFrame(columns=['Company','Year','Total Liabilities','Total Liabilities Growth (%)'])
liability['Company'] = df['Company']
liability['Year'] = df['Year']
liability['Total Liabilities'] = df['Total Liabilities']
liability['Total Liabilities Growth (%)'] = df.groupby(['Company'])['Total Liabilities'].pct_change() * 100
liability
Total_Assets_Growth = liability['Total Liabilities Growth (%)']
df = pd.concat([df, Total_Assets_Growth], axis=1)
df
#The total Liabilities Growth showed an increasing trend for all three companies from 2022 to 2024.
#The growth percentage reports a massive increase of 18% in Total Liabilities of Microsoft for the fiscal year 2024, whereas a decrease f
```

	Company	Year	Total Revenue	Net Income	Total Assets	Total Liabilities	Cash Flow	Revenue Growth (%)	Net Income Growth (%)	Total Assets Growth (%)	Total Liabilities Growth (%)
8	Apple	2022	394328000000	99803000000	352755000000	302083000000	122151000000	NaN	NaN	NaN	NaN
7	Apple	2023	383285000000	96995000000	352583000000	290437000000	110543000000	-3	-3	-0	-4
6	Apple	2024	391035000000	93736000000	364980000000	308030000000	118254000000	2	-3	4	6
2	Microsoft	2022	198270000000	72738000000	364840000000	198298000000	89035000000	NaN	NaN	NaN	NaN
1	Microsoft	2023	211915000000	72316000000	411976000000	205753000000	87582000000	7	-1	13	4
0	Microsoft	2024	245122000000	88136000000	512163000000	243686000000	118548000000	16	22	24	18
5	Tesla	2022	81462000000	12587000000	82338000000	36440000000	14724000000	NaN	NaN	NaN	NaN
4	Tesla	2023	96773000000	14974000000	106618000000	43009000000	13256000000	19	19	29	18

Next steps: Generate code with df | View recommended plots | New interactive sheet

```
cashflow = pd.DataFrame(columns=['Company','Year','Cash Flow','Cash Flow Growth (%)'])
cashflow['Company'] = df['Company']
cashflow['Year'] = df['Year']
cashflow['Cash Flow'] = df['Cash Flow']
cashflow['Cash Flow Growth (%)'] = df.groupby(['Company'])['Cash Flow'].pct_change() * 100
cashflow
Cash_Flow_Growth = cashflow['Cash Flow Growth (%)']
df = pd.concat([df, Cash_Flow_Growth], axis=1)
df
#The operational cashflow rate shows a decreasing trend for all three companies during the fiscal year 2022-23, with Microsoft reporting
#Although it also shows an increasing trend for all three companies during the fiscal year 2023-24, with Microsoft reporting the highest
```

	Company	Year	Total Revenue	Net Income	Total Assets	Total Liabilities	Cash Flow	Revenue Growth (%)	Net Income Growth (%)	Total Assets Growth (%)	Total Liabilities Growth (%)	Cash Flow Growth (%)
8	Apple	2022	394328000000	99803000000	352755000000	302083000000	122151000000	NaN	NaN	NaN	NaN	NaN
7	Apple	2023	383285000000	96995000000	352583000000	290437000000	110543000000	-3	-3	-0	-4	-10
6	Apple	2024	391035000000	93736000000	364980000000	308030000000	118254000000	2	-3	4	6	7
2	Microsoft	2022	198270000000	72738000000	364840000000	198298000000	89035000000	NaN	NaN	NaN	NaN	NaN
1	Microsoft	2023	211915000000	72316000000	411976000000	205753000000	87582000000	7	-1	13	4	-2
0	Microsoft	2024	245122000000	88136000000	512163000000	243686000000	118548000000	16	22	24	18	35
5	Tesla	2022	81462000000	12587000000	82338000000	36440000000	14724000000	NaN	NaN	NaN	NaN	NaN
4	Tesla	2023	96773000000	14974000000	106618000000	43009000000	13256000000	19	19	29	18	-10

Next steps: Generate code with df | View recommended plots | New interactive sheet

```
#Adding a new feature 'Profit Margin'
def calculate_profit_margin(row):
  net_income = row['Net Income']
  total_revenue = row['Total Revenue']
  Profit_Margin = (net_income / total_revenue) * 100
  return Profit_Margin
df['Profit_Margin'] = df.apply(calculate_profit_margin, axis=1)
df
```

	Company	Year	Total Revenue	Net Income	Total Assets	Total Liabilities	Cash Flow	Revenue Growth (%)	Net Income Growth (%)	Total Assets Growth (%)	Total Liabilities Growth (%)	Cash Flow Growth (%)
8	Apple	2022	394328000000	99803000000	352755000000	302083000000	122151000000	NaN	NaN	NaN	NaN	NaN
7	Apple	2023	383285000000	96995000000	352583000000	290437000000	110543000000	-3	-3	-0	-4	-10
6	Apple	2024	391035000000	93736000000	364980000000	308030000000	118254000000	2	-3	4	6	7
2	Microsoft	2022	198270000000	72738000000	364840000000	198298000000	89035000000	NaN	NaN	NaN	NaN	NaN
1	Microsoft	2023	211915000000	72316000000	411976000000	205753000000	87582000000	7	-1	13	4	-2
0	Microsoft	2024	245122000000	88136000000	512163000000	243686000000	118548000000	16	22	24	18	35
5	Tesla	2022	81462000000	12587000000	82338000000	36440000000	14724000000	NaN	NaN	NaN	NaN	NaN
4	Tesla	2023	96773000000	14974000000	106618000000	43009000000	13256000000	19	19	29	18	-10

Next steps: Generate code with df | View recommended plots | New interactive sheet

```
#Adding a new feature 'Return on Equity(ROE)'
def calculate_roe(row):
  net_income = row['Net Income']
  equity = row['Total Assets'] - row['Total Liabilities']
  ROE = (net_income / equity) * 100
  return ROE
df['ROE'] = df.apply(calculate_roe, axis=1)
df
```

	Company	Year	Total Revenue	Net Income	Total Assets	Total Liabilities	Cash Flow	Revenue Growth (%)	Net Income Growth (%)	Total Assets Growth (%)	Total Liabilities Growth (%)	Cash Flow Growth (%)
8	Apple	2022	394328000000	99803000000	352755000000	302083000000	122151000000	NaN	NaN	NaN	NaN	NaN
7	Apple	2023	383285000000	96995000000	352583000000	290437000000	110543000000	-3	-3	-0	-4	-10
6	Apple	2024	391035000000	93736000000	364980000000	308030000000	118254000000	2	-3	4	6	7
2	Microsoft	2022	198270000000	72738000000	364840000000	198298000000	89035000000	NaN	NaN	NaN	NaN	NaN
1	Microsoft	2023	211915000000	72316000000	411976000000	205753000000	87582000000	7	-1	13	4	-2
0	Microsoft	2024	245122000000	88136000000	512163000000	243686000000	118548000000	16	22	24	18	35