

importing required libraries

```
In [1]: 1 import pandas as pd
        2 import numpy as np
```

converting excel sheet to csv

```
In [4]: 1 df=pd.read_csv("Final_report.csv")
```

```
In [5]: 1 df
```

```
Out[5]:
```

	Year	Total Revenue	Net Income	Total Assets	Total Liabilities	Cash Flow from Operating Activities	Company
0	2023	211915	72361	411976	205753	87582	Microsoft
1	2022	198270	72738	364840	198298	89035	Microsoft
2	2021	168088	61271	333779	191791	76740	Microsoft
3	2023	96773	14974	106618	43009	13256	Tesla
4	2022	81462	12556	82338	36440	14724	Tesla
5	2021	53821	5519	62131	30548	11497	Tesla
6	2023	383285	96995	352583	290437	110543	Apple
7	2022	394328	99803	352755	302083	122151	Apple
8	2021	365817	94680	351002	287912	104038	Apple

calculating year-by-year growth percentage



```
In [6]: 1 df['Revenue Growth (%)'] = df.groupby('Company')['Total Revenue'].pct_change()
        2 df['Net Income Growth (%)'] = df.groupby('Company')['Net Income'].pct_change()
```

In [7]:

```
1 df
```

Out[7]:

	Year	Total Revenue	Net Income	Total Assets	Total Liabilities	Cash Flow from Operating Activities	Company	Revenue Growth (%)	Net Income Growth (%)
0	2023	211915	72361	411976	205753	87582	Microsoft	NaN	NaN
1	2022	198270	72738	364840	198298	89035	Microsoft	-6.438902	0.520999
2	2021	168088	61271	333779	191791	76740	Microsoft	-15.222676	-15.764800
3	2023	96773	14974	106618	43009	13256	Tesla	NaN	NaN
4	2022	81462	12556	82338	36440	14724	Tesla	-15.821562	-16.147990
5	2021	53821	5519	62131	30548	11497	Tesla	-33.931158	-56.044919
6	2023	383285	96995	352583	290437	110543	Apple	NaN	NaN
7	2022	394328	99803	352755	302083	122151	Apple	2.881146	2.894995
8	2021	365817	94680	351002	287912	104038	Apple	-7.230275	-5.133112

Imputing Null/NAN values that result from pct_Change

In [9]:

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

Out[9]:

```
Year                0
Total Revenue       0
Net Income          0
Total Assets        0
Total Liabilities   0
Cash Flow from Operating Activities  0
Company             0
Revenue Growth (%)  3
Net Income Growth (%) 3
dtype: int64
```

In [10]:

```
1 df.fillna(0,inplace=True)
```

In [11]:

```
1 df
```

Out[11]:

	Year	Total Revenue	Net Income	Total Assets	Total Liabilities	Cash Flow from Operating Activities	Company	Revenue Growth (%)	Net Income Growth (%)
0	2023	211915	72361	411976	205753	87582	Microsoft	0.000000	0.000000
1	2022	198270	72738	364840	198298	89035	Microsoft	-6.438902	0.520999
2	2021	168088	61271	333779	191791	76740	Microsoft	-15.222676	-15.764800
3	2023	96773	14974	106618	43009	13256	Tesla	0.000000	0.000000
4	2022	81462	12556	82338	36440	14724	Tesla	-15.821562	-16.147990
5	2021	53821	5519	62131	30548	11497	Tesla	-33.931158	-56.044919
6	2023	383285	96995	352583	290437	110543	Apple	0.000000	0.000000
7	2022	394328	99803	352755	302083	122151	Apple	2.881146	2.894995
8	2021	365817	94680	351002	287912	104038	Apple	-7.230275	-5.133112

In [12]:

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

Out[12]:

```
Year                0
Total Revenue       0
Net Income          0
Total Assets        0
Total Liabilities   0
Cash Flow from Operating Activities  0
Company             0
Revenue Growth (%)  0
Net Income Growth (%)  0
dtype: int64
```

calculating other columns growth rates

In [29]:

```
1
2 df['Assets Growth (%)']=df.groupby('Company')['Total Assets'].pct_change()
3 df['Cash Flow from Operations Growth(%)'] = df.groupby('Company')['Cash
4 df['Liabilities Growth (%)']=df.groupby('Company')['Total Liabilities']
5
```

In [30]:

```
1 df
```

Out[30]:

	Year	Total Revenue	Net Income	Total Assets	Total Liabilities	Cash Flow from Operating Activities	Company	Revenue Growth (%)	Net Income Growth (%)
0	2023	211915	72361	411976	205753	87582	Microsoft	0.000000	0.000000
1	2022	198270	72738	364840	198298	89035	Microsoft	-6.438902	0.520999
2	2021	168088	61271	333779	191791	76740	Microsoft	-15.222676	-15.764800
3	2023	96773	14974	106618	43009	13256	Tesla	0.000000	0.000000
4	2022	81462	12556	82338	36440	14724	Tesla	-15.821562	-16.147990
5	2021	53821	5519	62131	30548	11497	Tesla	-33.931158	-56.044919
6	2023	383285	96995	352583	290437	110543	Apple	0.000000	0.000000
7	2022	394328	99803	352755	302083	122151	Apple	2.881146	2.894995
8	2021	365817	94680	351002	287912	104038	Apple	-7.230275	-5.133112

In [31]:

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

```
Out[31]: Year                                0
Total Revenue                             0
Net Income                                0
Total Assets                              0
Total Liabilities                         0
Cash Flow from Operating Activities       0
Company                                   0
Revenue Growth (%)                        0
Net Income Growth (%)                    0
Assets Growth (%):                        3
Cash Flow from Operations Growth(%)      3
Liabilities Growth (%):                  3
Assets Growth (%)                        3
Liabilities Growth (%)                   3
dtype: int64
```

```
In [32]: 1 df.fillna(0,inplace=True)
2 df
```

Out[32]:

	Year	Total Revenue	Net Income	Total Assets	Total Liabilities	Cash Flow from Operating Activities	Company	Revenue Growth (%)	Net Income Growth (%)
0	2023	211915	72361	411976	205753	87582	Microsoft	0.000000	0.000000
1	2022	198270	72738	364840	198298	89035	Microsoft	-6.438902	0.520999
2	2021	168088	61271	333779	191791	76740	Microsoft	-15.222676	-15.764800
3	2023	96773	14974	106618	43009	13256	Tesla	0.000000	0.000000
4	2022	81462	12556	82338	36440	14724	Tesla	-15.821562	-16.147990
5	2021	53821	5519	62131	30548	11497	Tesla	-33.931158	-56.044919
6	2023	383285	96995	352583	290437	110543	Apple	0.000000	0.000000
7	2022	394328	99803	352755	302083	122151	Apple	2.881146	2.894995
8	2021	365817	94680	351002	287912	104038	Apple	-7.230275	-5.133112

```
In [33]: 1 df.isnull().sum()
```

```
Out[33]: Year                                0
Total Revenue                              0
Net Income                                0
Total Assets                              0
Total Liabilities                          0
Cash Flow from Operating Activities        0
Company                                    0
Revenue Growth (%)                         0
Net Income Growth (%)                     0
Assets Growth (%)                          0
Cash Flow from Operations Growth(%)       0
Liabilities Growth (%)                     0
Assets Growth (%)                          0
Liabilities Growth (%)                     0
dtype: int64
```

```
In [34]: 1 df.to_csv("Final_data_report.csv")
2 summary=df.groupby('Company').agg({
3     'Revenue Growth (%)': 'mean',
4     'Net Income Growth (%)': 'mean',
5     'Assets Growth (%)' : 'mean',
6     'Liabilities Growth (%)' : 'mean',
7     'Cash Flow from Operations Growth(%)' : 'mean'
8 }).reset_index()
```

```
In [35]: 1 print("Overall Growth/Fall rate for Apple, Microsoft and Tesla from Fiscal  
2 summary
```

Overall Growth/Fall rate for Apple, Microsoft and Tesla from Fiscal Year 2021 - 2023

Out[35]:

	Company	Revenue Growth (%)	Net Income Growth (%)	Assets Growth (%)	Liabilities Growth (%)	Cash Flow from Operations Growth(%)
0	Apple	-1.449710	-0.746039	-0.149388	-0.227092	-1.442492
1	Microsoft	-7.220526	-5.081267	-6.651679	-2.301567	-4.050053
2	Tesla	-16.584240	-24.064303	-15.771471	-10.480864	-3.614123