Financial Performance Analysis of Microsoft, Tesla, and Apple

This analysis evaluates the financial performance of Microsoft, Tesla, and Apple from fiscal years 2021 to 2023. The key financial metrics assessed include Total Revenue, Net Income, Total Assets, Total Liabilities, and Cash Flow from Operating Activities. The goal is to identify trends and insights that reflect the financial health of these companies.

Methodology

1. **Data Collection**: Financial data for Microsoft, Tesla, and Apple was gathered for the fiscal years 2021-2023.
2. **Data Preparation**: The data was organized into a DataFrame using pandas, ensuring that all values were in a numerical format for analysis.
3. **Calculations**: Year-over-year percentage changes were calculated for each financial metric using the `pct_change()` function.
4. **Analysis**: Trends were analyzed to assess the performance and financial health of each company.

```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

```
# Load your CSV file into a pandas DataFrame
df = pd.read_csv('/content/financial data from the 10-K filings.csv')

# Display the first few rows of the DataFrame to verify
df.head()
```

	Company	Fiscal Year	Total Revenue	Net Income	Total Assets	Total Liabilities	Cash Flow from Operating Activities
0	Microsoft	2023	211,915	72,361	411,976	205,753	87,582
1	Microsoft	2022	198,270	72,738	364,840	198,298	89,035
2	Microsoft	2021	168,088	61,271	333,779	191,791	76,740
3	Tesla	2023	96,773	14,974	106,618	43,009	13,256
4	Tesla	2022	81,462	12,587	82,338	36,440	14,724

```
# Columns to remove commas from
columns_to_clean = ['Total Revenue', 'Net Income', 'Total Assets', 'Total Liabilities', 'Cash Flow from Operating Activities']

print(df.head())
```

```
     Company  Fiscal Year Total Revenue Net Income Total Assets  \
0  Microsoft         2023       211,915     72,361      411,976
1  Microsoft         2022       198,270     72,738      364,840
2  Microsoft         2021       168,088     61,271      333,779
3      Tesla         2023        96,773     14,974      106,618
4      Tesla         2022        81,462     12,587       82,338

  Total Liabilities Cash Flow from Operating Activities
0           205,753                             87,582
1           198,298                             89,035
2           191,791                             76,740
3            43,009                             13,256
4            36,440                             14,724
```

```
# Remove commas and convert to numeric
for column in columns_to_clean:
    df[column] = df[column].str.replace(',', '').astype(float)

# Print the head of the DataFrame to inspect the changes
print(df.head())
```

```
     Company  Fiscal Year  Total Revenue  Net Income  Total Assets  \
0  Microsoft         2023       211915.0     72361.0      411976.0
1  Microsoft         2022       198270.0     72738.0      364840.0
2  Microsoft         2021       168088.0     61271.0      333779.0
3      Tesla         2023        96773.0     14974.0      106618.0
4      Tesla         2022        81462.0     12587.0       82338.0

   Total Liabilities  Cash Flow from Operating Activities
0           205753.0                              87582.0
1           198298.0                              89035.0
2           191791.0                              76740.0
3            43009.0                              13256.0
4            36440.0                              14724.0
```

```
# Check data types
print(df.dtypes)

# If necessary, convert columns to numeric
for column in columns_to_clean:
    if df[column].dtype != 'float64' and df[column].dtype != 'int64':
        df[column] = pd.to_numeric(df[column], errors='coerce')  # 'coerce' will handle errors by setting invalid values to NaN

# ... (rest of your code)
```

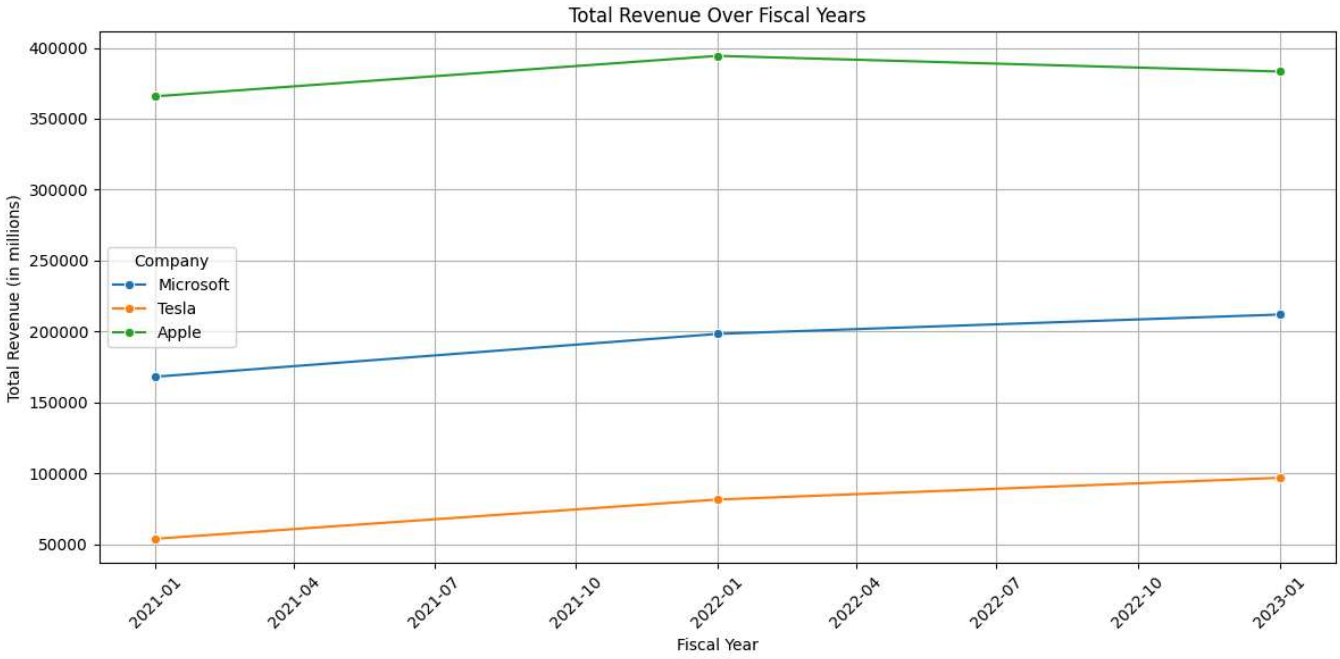
```
Company                                    object
Fiscal Year                          datetime64[ns]
Total Revenue                               float64
Net Income                                  float64
Total Assets                                float64
Total Liabilities                           float64
Cash Flow from Operating Activities         float64
dtype: object
```

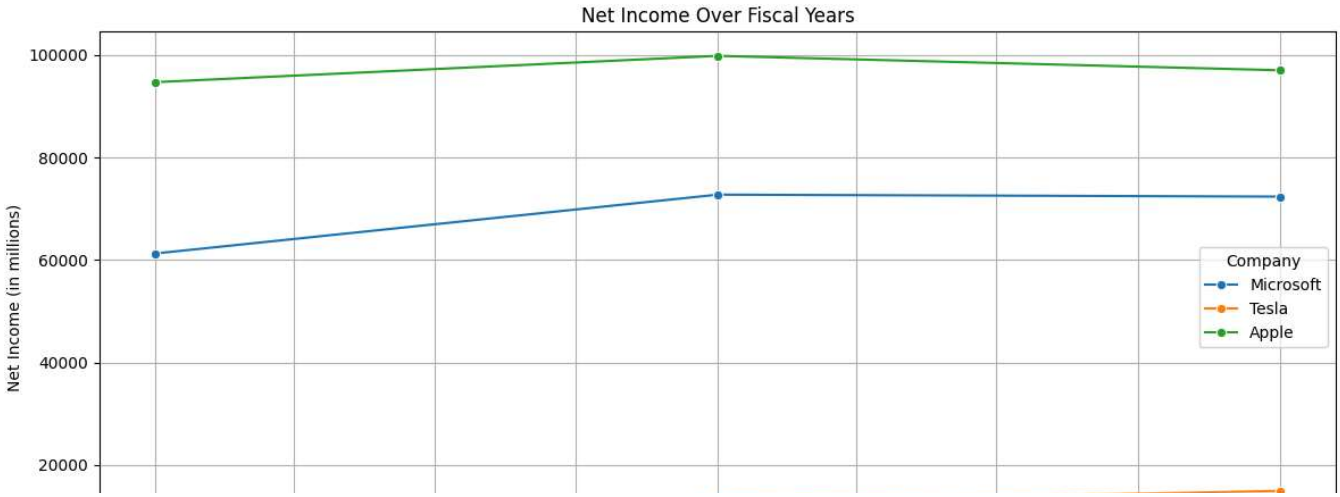
```
# Calculate year-over-year percentage changes
df['Revenue Growth (%)'] = df.groupby('Company')['Total Revenue'].pct_change() * 100
df['Net Income Growth (%)'] = df.groupby('Company')['Net Income'].pct_change() * 100
df['Total Assets Growth (%)'] = df.groupby('Company')['Total Assets'].pct_change() * 100
df['Total Liabilities Growth (%)'] = df.groupby('Company')['Total Liabilities'].pct_change() * 100
df['Cash Flow Growth (%)'] = df.groupby('Company')['Cash Flow from Operating Activities'].pct_change() * 100



print(df)
```

```
      Company Fiscal Year  Total Revenue  Net Income  Total Assets  \
0  Microsoft  2023-01-01       211915.0     72361.0      411976.0
1  Microsoft  2022-01-01       198270.0     72738.0      364840.0
2  Microsoft  2021-01-01       168088.0     61271.0      333779.0
3      Tesla  2023-01-01        96773.0     14974.0      106618.0
4      Tesla  2022-01-01        81462.0     12587.0       82338.0
5      Tesla  2021-01-01        53823.0      5644.0       62131.0
6      Apple  2023-01-01       383285.0     96995.0      352583.0
7      Apple  2022-01-01       394328.0     99803.0      352755.0
8      Apple  2021-01-01       365817.0     94680.0      351002.0

   Total Liabilities  Cash Flow from Operating Activities  Revenue Growth (%)  \
0           205753.0                              87582.0                 NaN
1           198298.0                              89035.0           -6.438902
2           191791.0                              76740.0          -15.222676
3            43009.0                              13256.0                 NaN
4            36440.0                              14724.0          -15.821562
5            30548.0                              11497.0          -33.928703
6           290437.0                             110543.0                 NaN
7           302083.0                             122151.0            2.881146
8           287912.0                             104038.0           -7.230275

   Net Income Growth (%)  Total Assets Growth (%)  \
0                    NaN                      NaN
1               0.520999                -11.441443
2             -15.764800                 -8.513595
3                    NaN                      NaN
4             -15.940964                -22.772890
5             -55.160086                -24.541524
6                    NaN                      NaN
7               2.894995                  0.048783
8              -5.133112                 -0.496945

   Total Liabilities Growth (%)  Cash Flow Growth (%)
0                           NaN                   NaN
1                     -3.623276              1.659017
2                     -3.281425            -13.809176
3                           NaN                   NaN
4                    -15.273547             11.074231
5                    -16.169045            -21.916599
6                           NaN                   NaN
7                      4.009820             10.500891
8                     -4.691095            -14.828368
```

```
# Plotting Total Revenue
plt.figure(figsize=(12, 6))
sns.lineplot(data=df, x='Fiscal Year', y='Total Revenue', hue='Company', marker='o')
plt.title('Total Revenue Over Fiscal Years')
plt.ylabel('Total Revenue (in millions)')
plt.xlabel('Fiscal Year')
plt.xticks(rotation=45)
plt.legend(title='Company')
plt.grid()
plt.tight_layout()
```

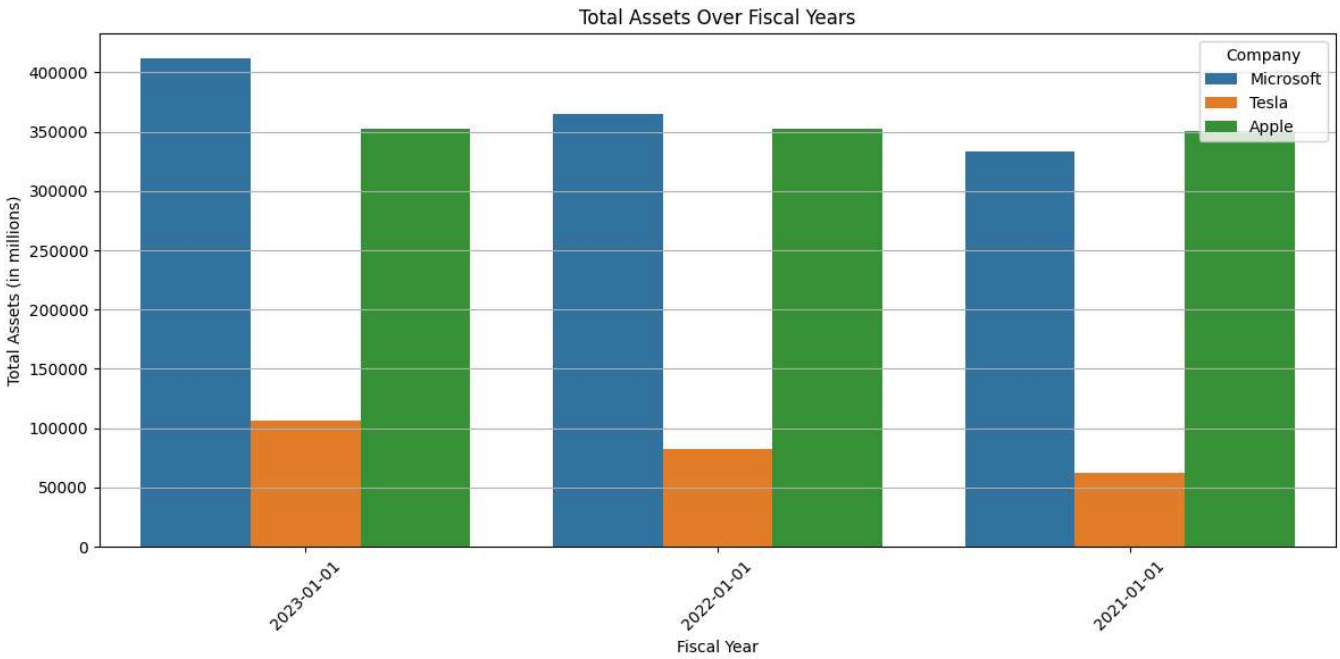
```
plt.show()

# Plotting Net Income
plt.figure(figsize=(12, 6))
sns.lineplot(data=df, x='Fiscal Year', y='Net Income', hue='Company', marker='o')
plt.title('Net Income Over Fiscal Years')
plt.ylabel('Net Income (in millions)')
plt.xlabel('Fiscal Year')
plt.xticks(rotation=45)
plt.legend(title='Company')
plt.grid()
plt.tight_layout()
plt.show()
```

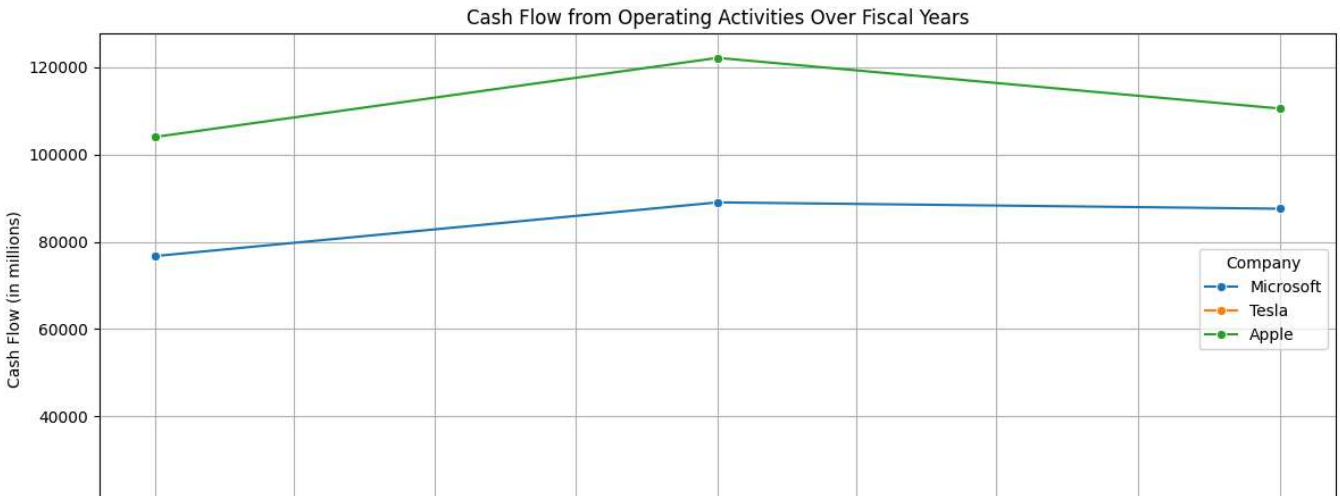





```
#Plotting Total Assets
plt.figure(figsize=(12, 6))
sns.barplot(data=df, x='Fiscal Year', y='Total Assets', hue='Company')
plt.title('Total Assets Over Fiscal Years')
plt.ylabel('Total Assets (in millions)')
plt.xlabel('Fiscal Year')
plt.xticks(rotation=45)
plt.legend(title='Company')
plt.grid(axis='y')
plt.tight_layout()
plt.show()

#Plotting Cash Flow

plt.figure(figsize=(12, 6))
sns.lineplot(data=df, x='Fiscal Year', y='Cash Flow from Operating Activities', hue='Company', marker='o')
plt.title('Cash Flow from Operating Activities Over Fiscal Years')
plt.ylabel('Cash Flow (in millions)')
plt.xlabel('Fiscal Year')
plt.xticks(rotation=45)
plt.legend(title='Company')
```

```
plt.grid()
plt.tight_layout()
plt.show()
```





Observations

Microsoft

- Total Revenue declined by 6.44% from 2022 to 2023.
- Net Income decreased by 15.76% in 2023.
- Total Assets decreased significantly, indicating potential challenges.

Tesla

- Total Revenue showed a significant decline of 15.82% in 2023.
- Net Income also fell by 15.94%.
- Cash Flow from Operating Activities improved, indicating better cash generation capabilities.

Apple

- Revenue saw a slight decline of 2.88% from 2022 to 2023.
- Net Income decreased by 5.13%, reflecting mixed performance.
- Maintained stable cash flow, demonstrating effective management.

Conclusions

All three companies faced financial challenges in the latest fiscal year, with declines in revenue and net income. While Microsoft and Tesla experienced more severe impacts, Apple showed better cash flow management. These insights can guide stakeholders in their decision-making and strategic planning.