A glimpse into financial ratios of some industries

ANALYZING FINANCIAL STATEMENTS IN PYTHON

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Average current ratio

- Current ratio = $\frac{\text{Current Assets}}{\text{Current Liabilities}}$
- Average Current Ratio of the industries:

```
balance_sheet["current_ratio"] =
                        balance_sheet["Total Current Assets"]/
                        balance_sheet["Total Current Liabilities"]
balance_sheet.pivot_table(index="comp_type", values="current_ratio")
```

comp_type	current_ratio
fmcg	0.869
real_est	1.026
tech	2.562

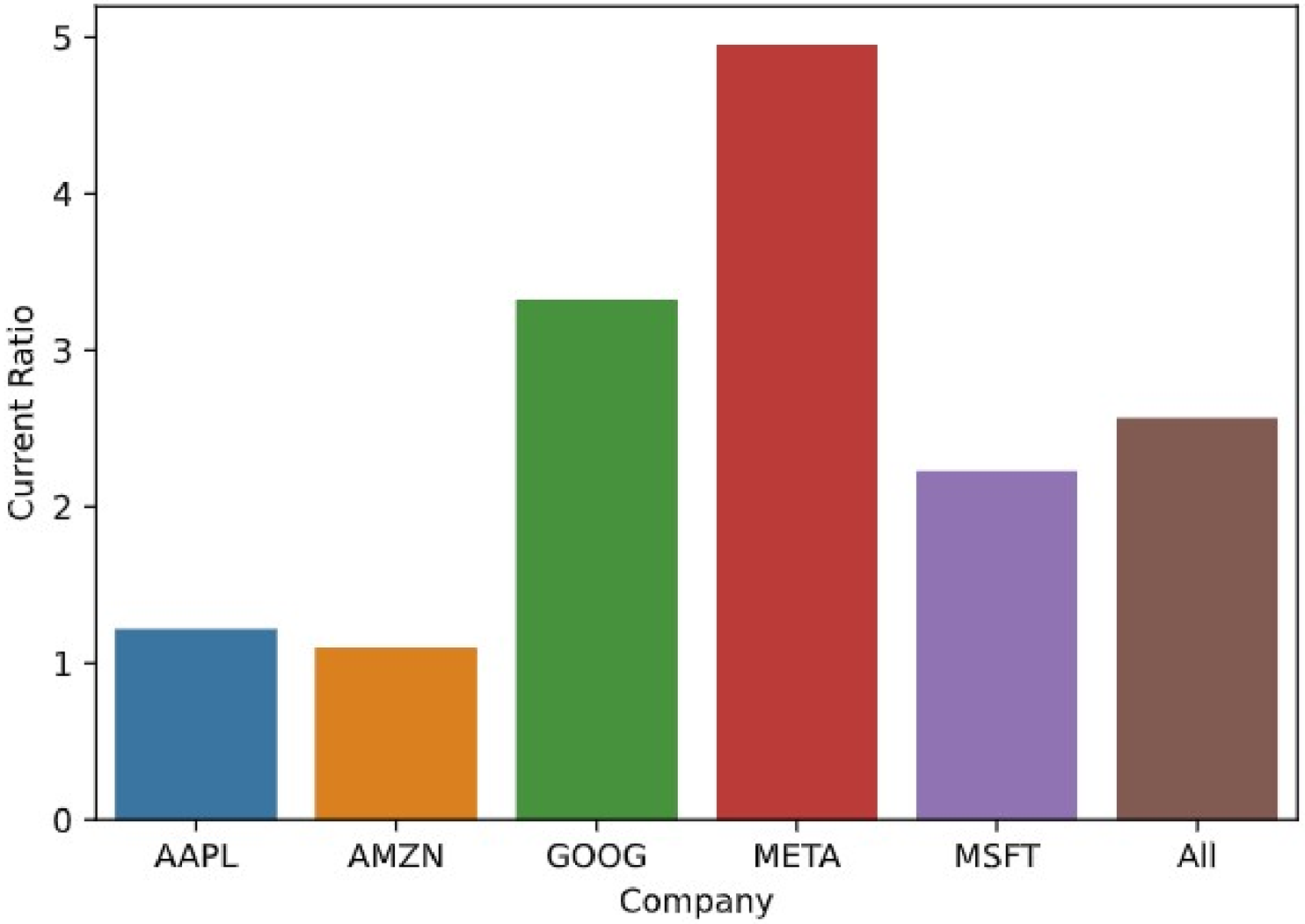
Average debt-to-equity ratio

- Debt-to-equity ratio = $\frac{\text{Total liabilities}}{\text{Total shareholders equity}}$
- Average Current Ratio of the industries:

```
balance_sheet["debt_to_equity"] =
                        balance_sheet["Total Liabilities"]/
                        balance_sheet["Total Shareholders Equity"]
balance_sheet.pivot_table(index="comp_type", values="debt_to_equity")
```

comp_type	debt_to_equity
fmcg	2.998
real_est	5.692
tech	1.777

Visually compare ratios with industry average



Making the bar plot

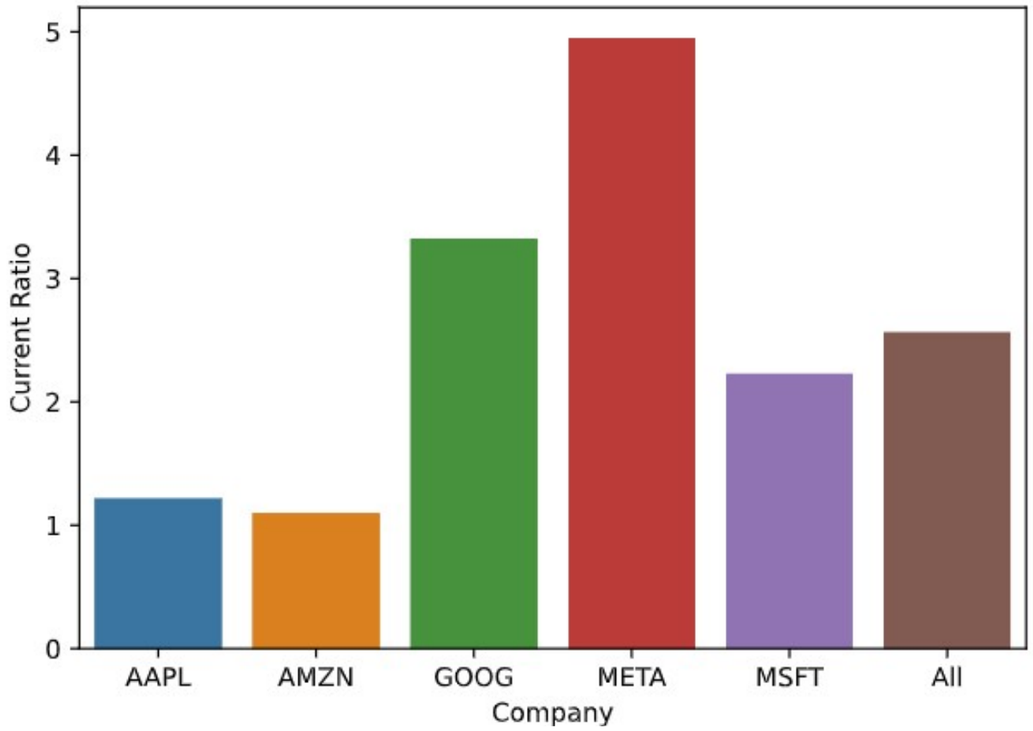
```
plot = balance_sheet_tech.pivot_table(index="company", values = "current_ratio",
                                      margins = True).reset_index()

plot
```

	company	current_ratio
0	AAPL	1.214
1	AMZN	1.095
2	GOOG	3.322
3	META	4.950
4	MSFT	2.227
5	All	2.562

Making the bar plot

```
sns.barplot(data=plot, x = "company", y = "current_ratio")
plt.ylabel("Current Ratio"), plt.xlabel("Company")
plt.show()
```



Let's practice!

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Profitability metrics

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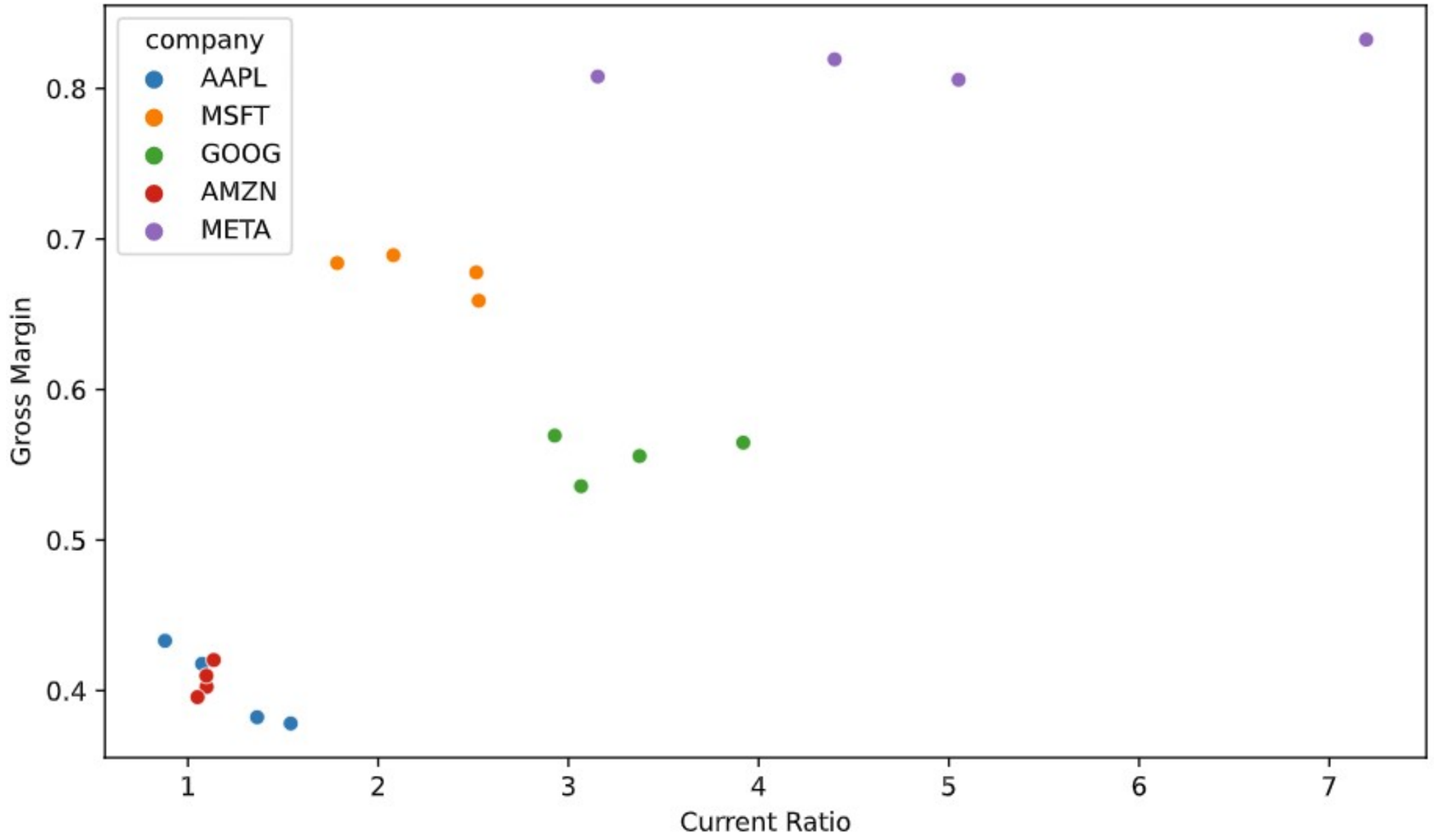
Profitability ratios

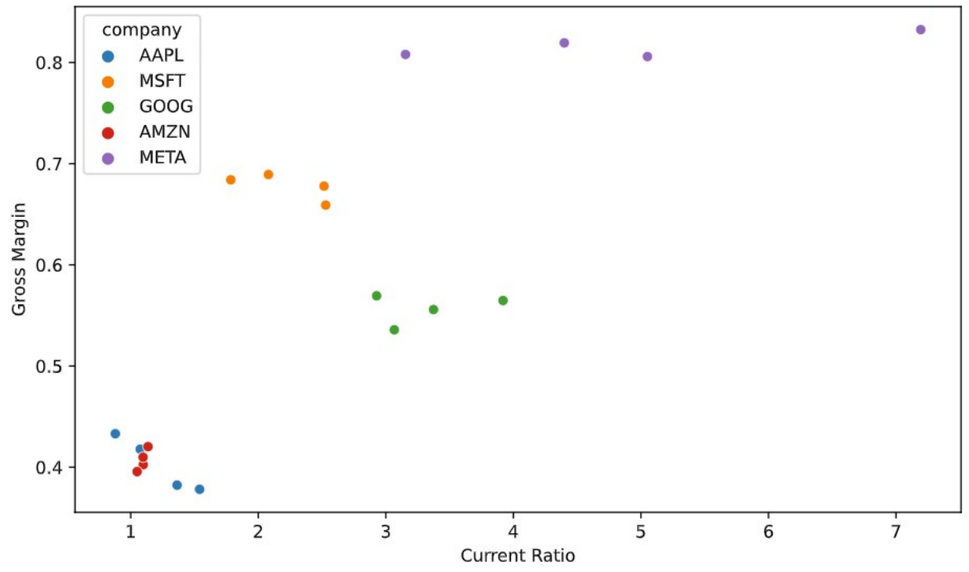
- Metric of how a company can generate profits from its revenue
- Some efficiency ratios are also profitability ratios:
  - Gross margin = $\frac{\text{Total Revenue - Cost of Goods Sold}}{\text{Total Revenue}}$
  - Operating Margin = $\frac{\text{Total Revenue - Operating Expenses}}{\text{Total Revenue}}$

High current ratio leads to high profitability?

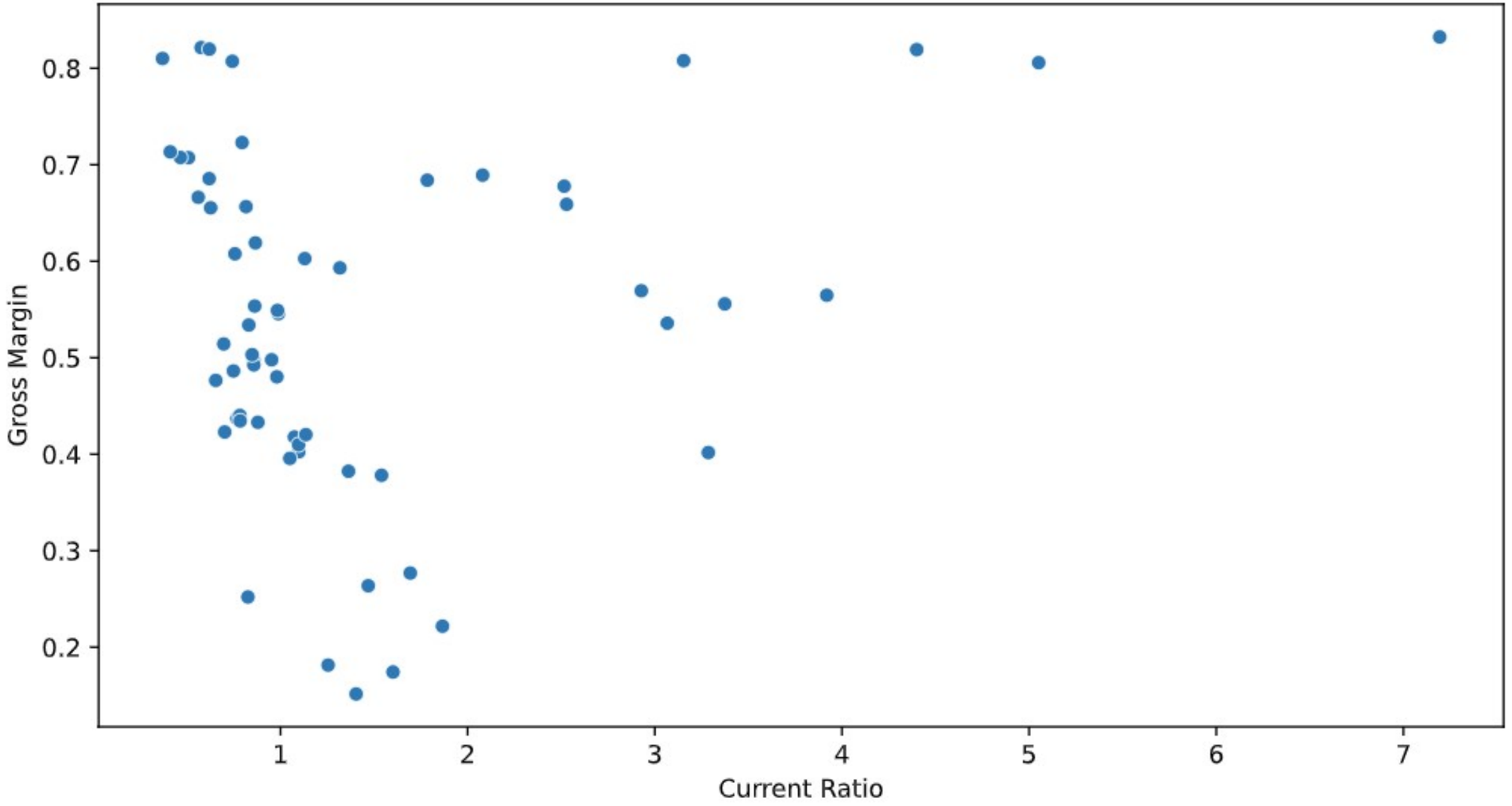


Make the scatter plot

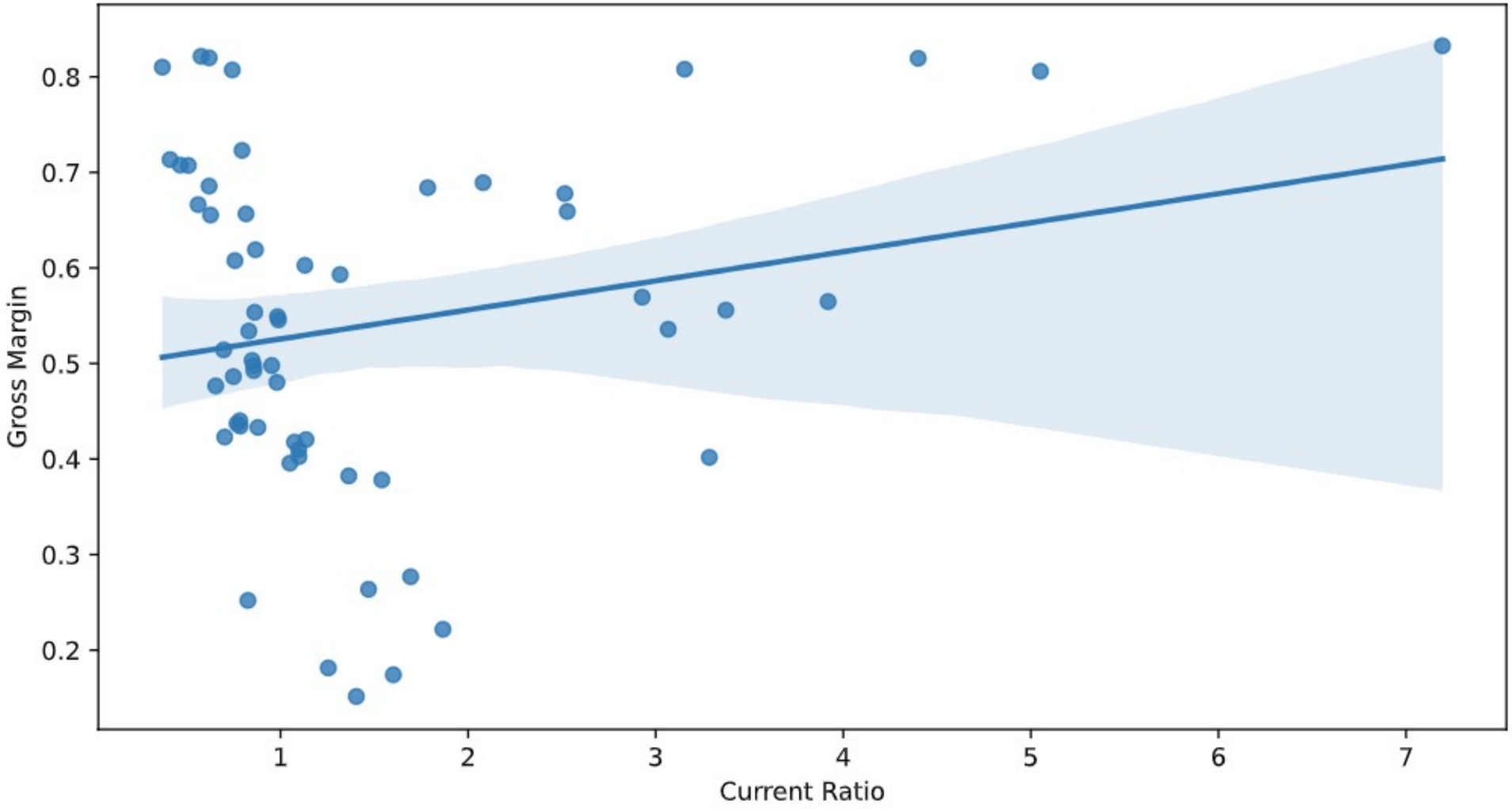
```
sns.scatterplot(data=dataset_tech, x="current_ratio", y="gross_margin",
                hue="Company")
plt.xlabel("Current Ratio")
plt.ylabel("Gross Margin")
plt.show()
```



Scatter plot with all the companies

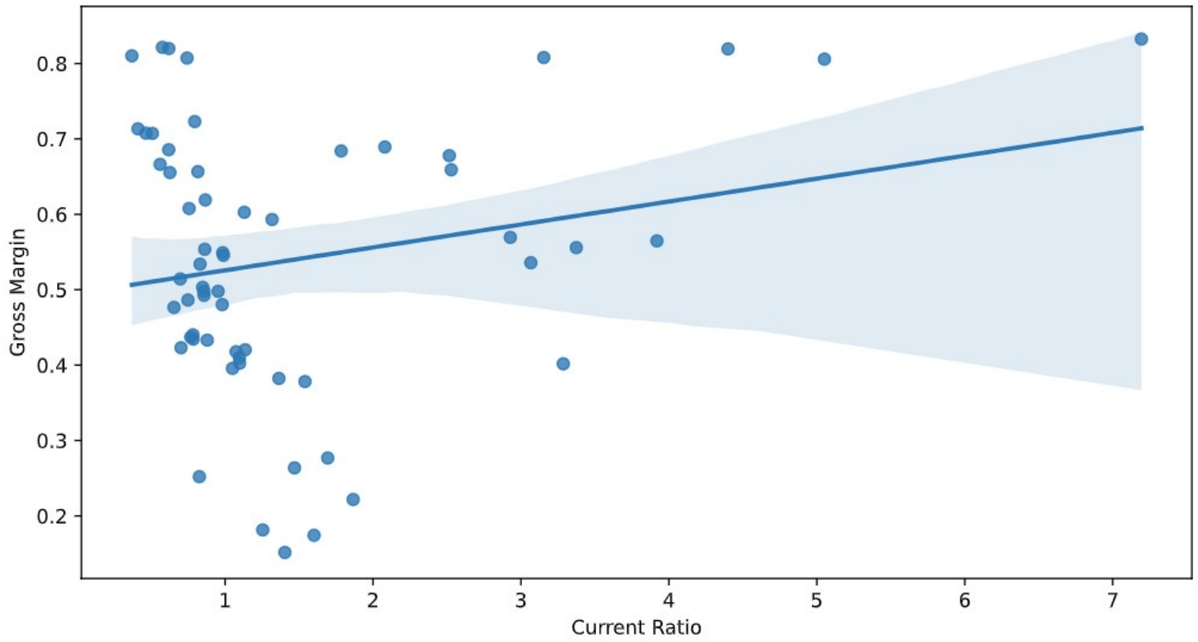


Add a line of best fit



Making scatter plot with a line of best fit

```
sns.regplot(data=dataset_tech, x="current_ratio", y="gross_margin")
plt.xlabel("Current Ratio")
plt.ylabel("Gross Margin")
plt.show()
```



Let's practice!

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More on analyzing profitability

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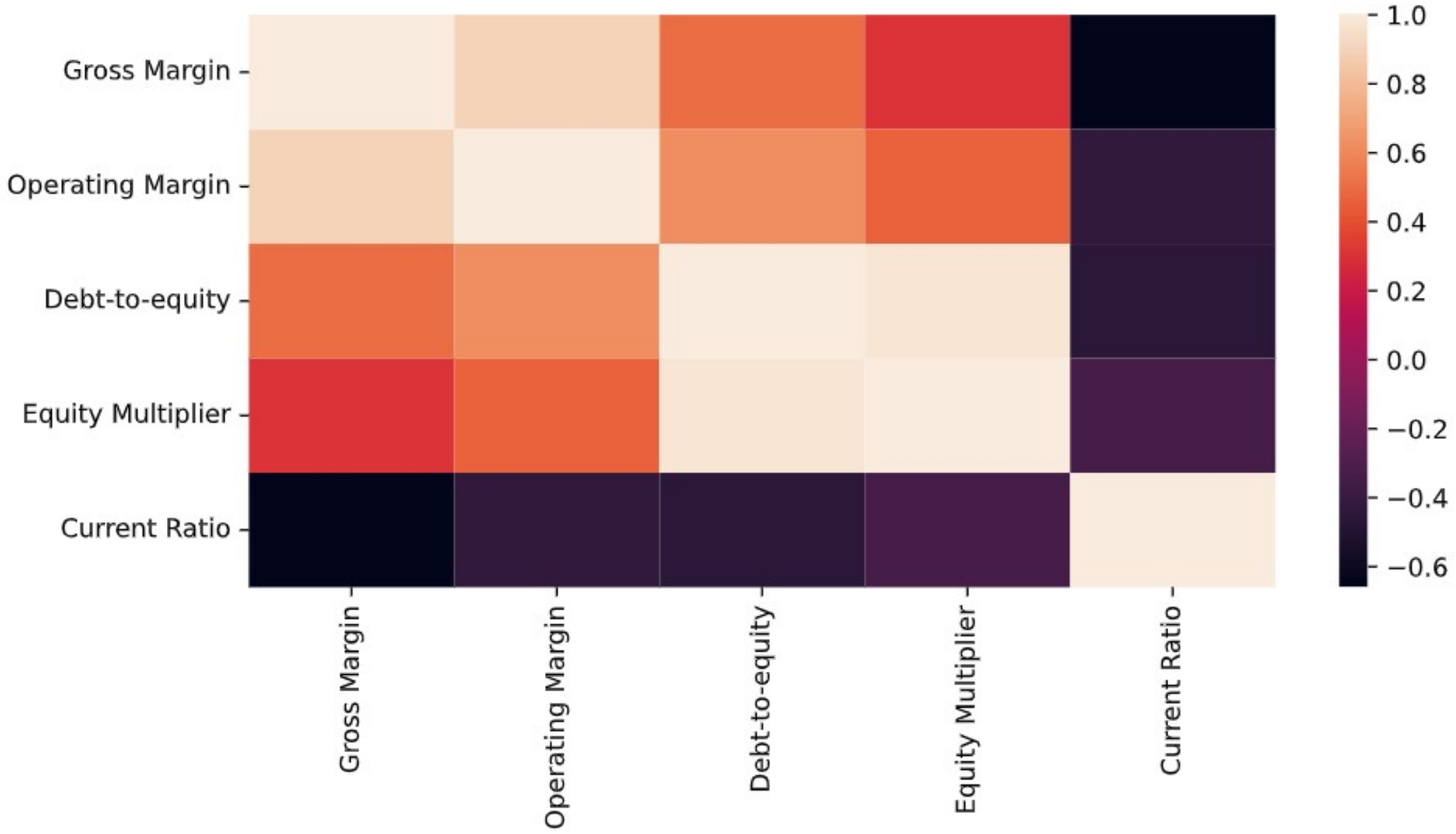
Checking correlations between different ratios



How to make a heat map

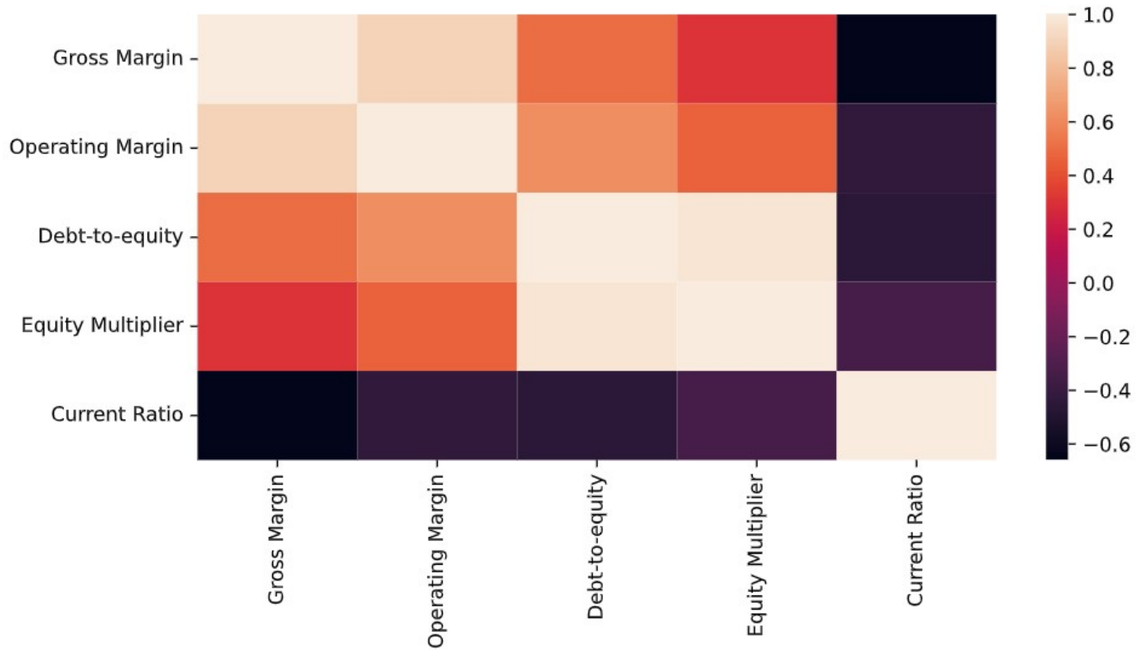
- Making a heat map require a matrix

```
real_est_corr = real_estate[["Gross Margin",
                             "Operating Margin", "Debt-to-equity",
                             "Equity Multiplier", "Current Ratio"]
                            ].corr()
real_est_corr
```

	Gross Margin	Operating Margin	Debt-to-equity	Equity Multiplier	Current Ratio
Gross Margin	1.000	0.896	0.495	0.302	-0.660
Operating Margin	0.896	1.000	0.616	0.457	-0.439
Debt-to-equity	0.495	0.616	1.000	0.969	-0.459
Equity Multiplier	0.302	0.457	0.969	1.000	-0.347
Current Ratio	-0.660	-0.439	-0.459	-0.347	1.000

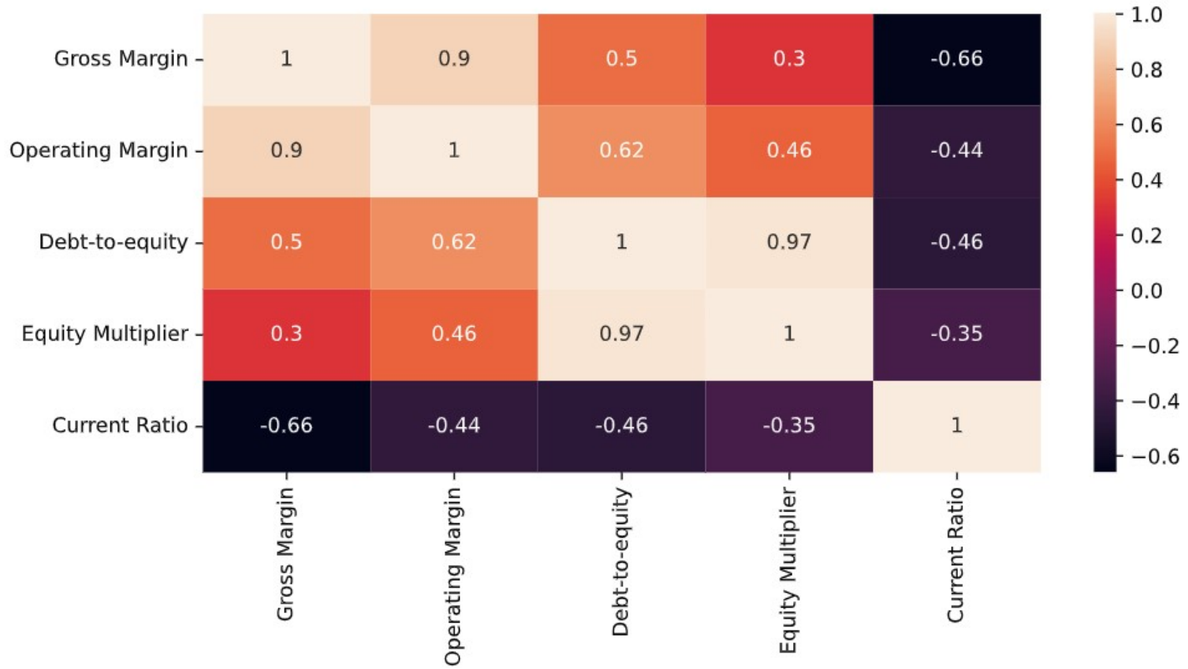
How to make a correlation plot

```
sns.heatmap(real_est_corr)
plt.show()
```

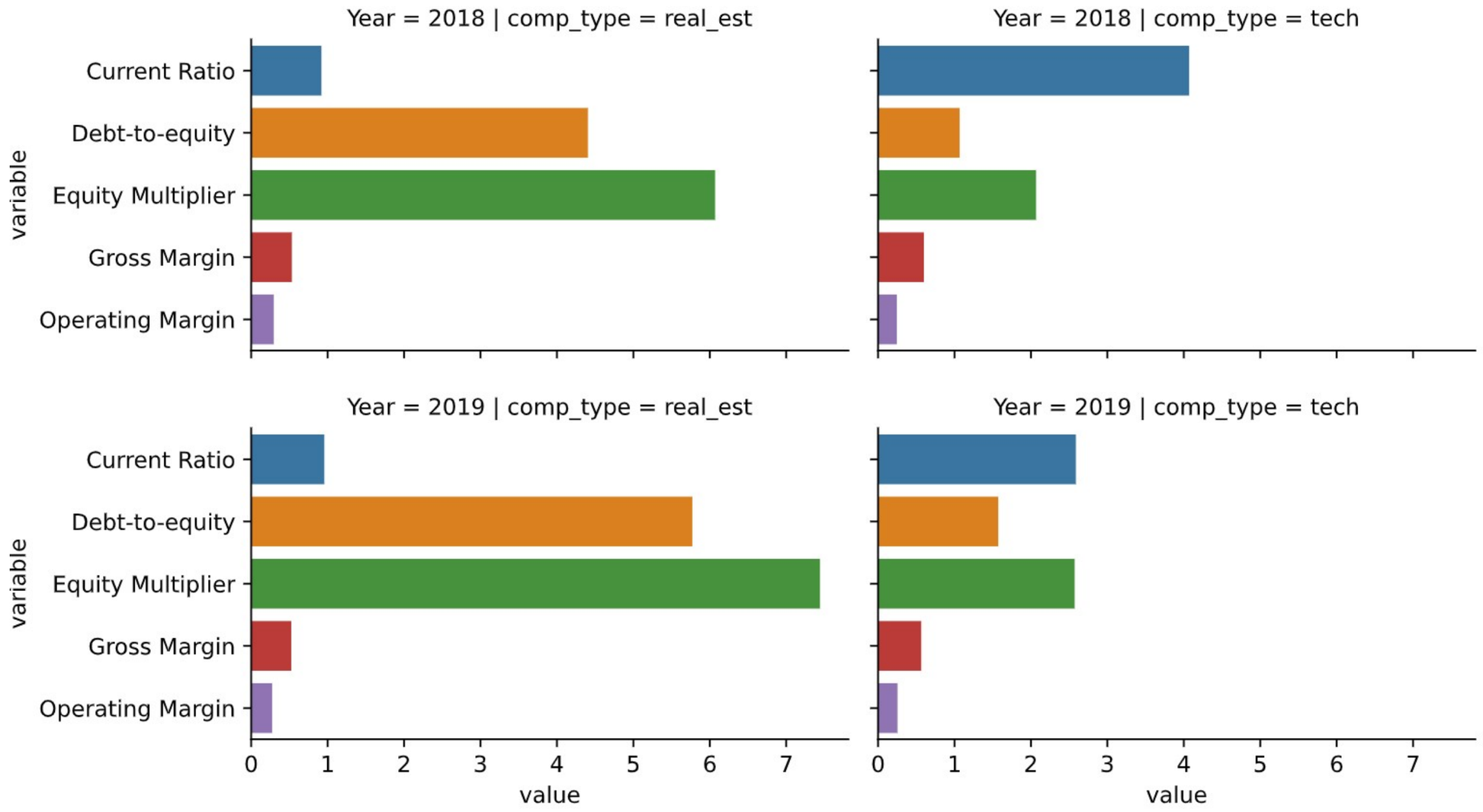


How to make a correlation plot

```
sns.heatmap(real_est_corr, annot=True)
plt.show()
```



Multifaceted bar chart

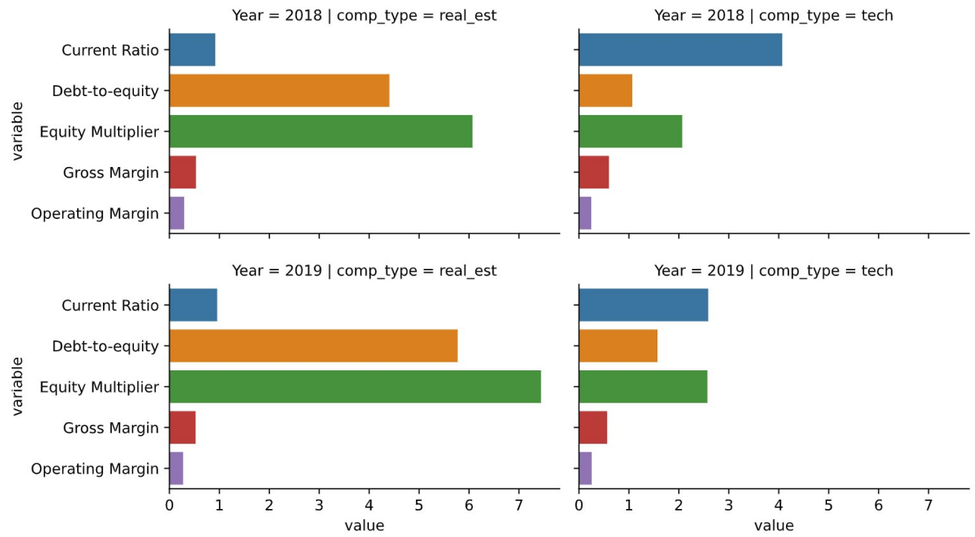


How to make a multifaceted bar chart?

	Year	comp_type	variable	value
0	2018	real_est	Current Ratio	0.919
1	2018	tech	Current Ratio	4.070
2	2019	real_est	Current Ratio	0.957
3	2019	tech	Current Ratio	2.588
4	2018	real_est	Debt-to-equity	4.406
5	2018	tech	Debt-to-equity	1.067
6	2019	real_est	Debt-to-equity	5.772
7	2019	tech	Debt-to-equity	1.572
8	2018	real_est	Equity Multiplier	6.070
9	2018	tech	Equity Multiplier	2.067
10	2019	real_est	Equity Multiplier	7.442
11	2019	tech	Equity Multiplier	2.572
12	2018	real_est	Gross Margin	0.532
13	2018	tech	Gross Margin	0.600

How to make a multifaceted bar chart?

```
sns.catplot(data=dataset, x="value", y="variable", row="Year", col = "comp_type",
            kind="bar")
plt.subplots_adjust(hspace=0.25)
plt.show()
```



Let's practice!

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Well done!

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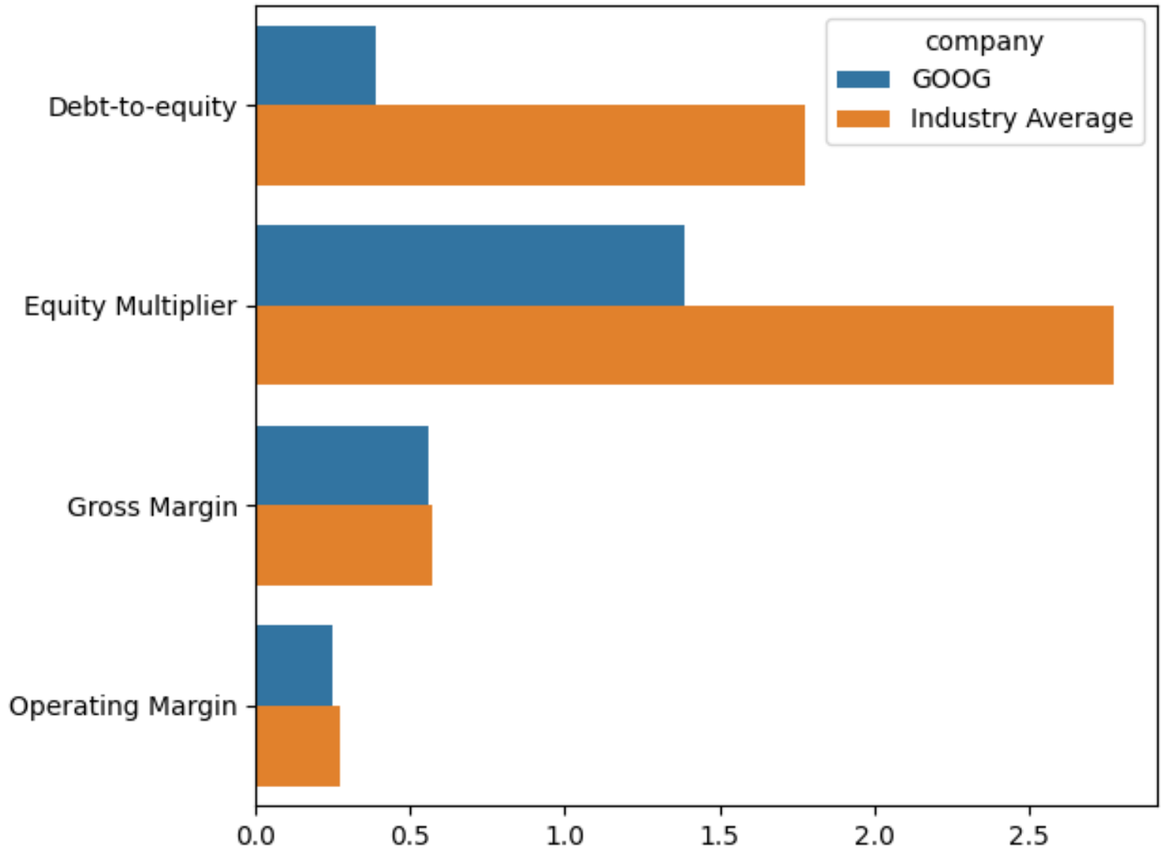
Summary

In this course, you learned how to:

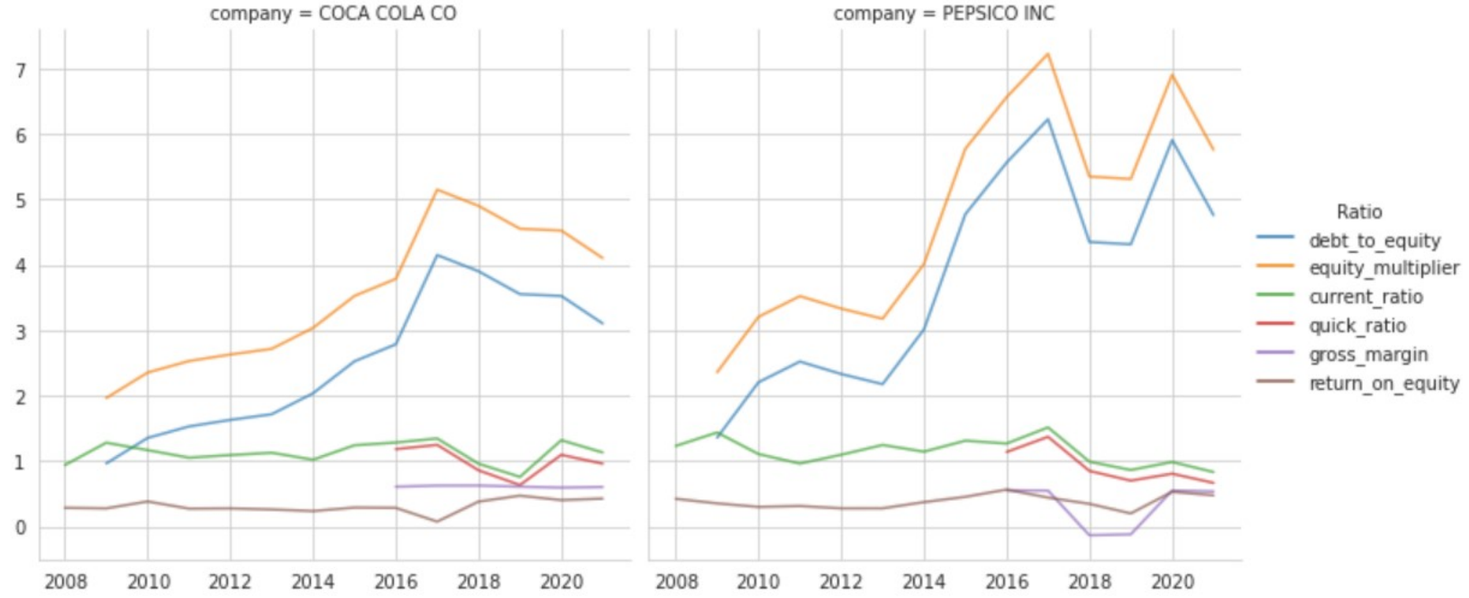
- Read and understand financial ratios from the balance sheet, income statement, and cash flow statement
- Use `pandas` to numerically analyze a company's finances
- Use `seaborn` to visualize a company's financial performance
- Visualize profitability metrics and analyze the

Summary

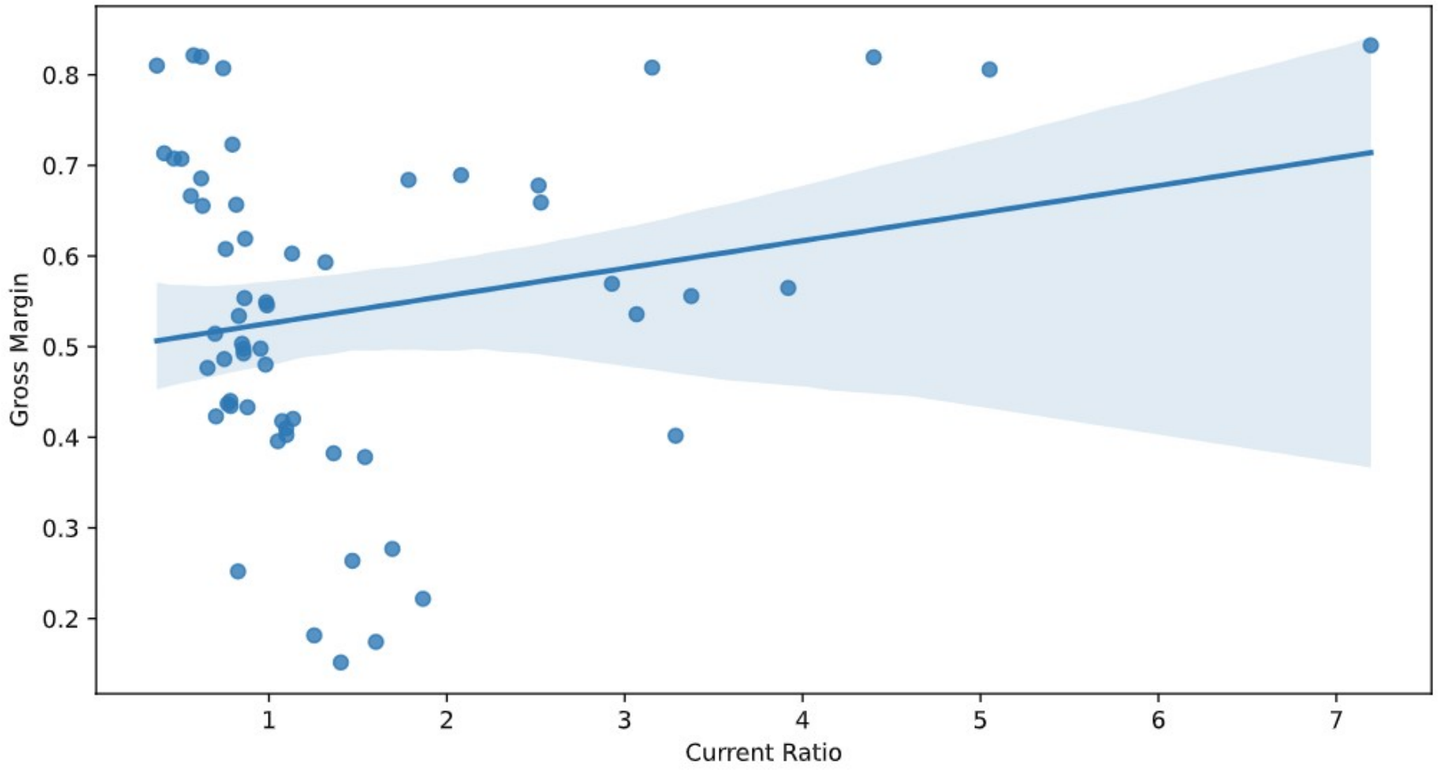
- Chapter 1 - Balance sheet
  - Balance sheet ratios
  - Compute relative difference in ratios
- Chapter 2 - Income statement
  - Financial ratios from the income statement and balance sheet
  - User-defined functions to reduce repetitive work
  - Visualize ratios for within-company analysis



- Chapter 3 - Cash flow statement
  - Financial ratios from cash flow statement, income statement, and balance sheet
  - Read `json` data using `pandas`
  - Impute missing values
  - Merge `pandas` DataFrames
  - Visualize ratios for between-company analysis



- Chapter 4 - Profitability
  - Profitability metrics
  - Difference in ratios between different industries
  - Make visualizations to analyze profitability



Recommended courses for the future

- Course on data science.
  - Understanding Data Science
  - Python Data Science Toolbox (Part 1)
  - Python Data Science Toolbox (Part 2)
- Courses on PowerBI
  - Data Visualization in Power BI

Let's practice!

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