

# Data Fundamentals



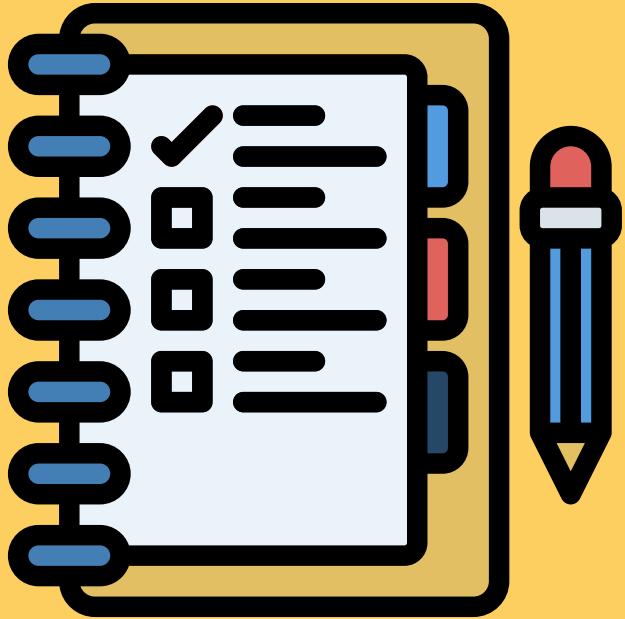
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Project: Analyze  
NYSE Data

# GOALS



- Interpret the measures of central tendency and spread (mean, median, standard deviation, range).
- Use a combination of Excel or Google Sheets functions (e.g., IF statements, INDEX, and MATCH, calculating descriptive statistics with the IF statement, dropdowns, data validation, VLOOKUP).
- Analyze and forecast financial business metrics using Excel or Google Sheets.
- Create visualizations of a business metric and use Excel or Google Sheets to create a financial forecast model.



# AGENDA

- Welcome
- Roadmap
- Overview
- Exploring Dataset Information
- Practical Example
- Introduction to Modeling
- Project Details
- Project Specification
- Q&A

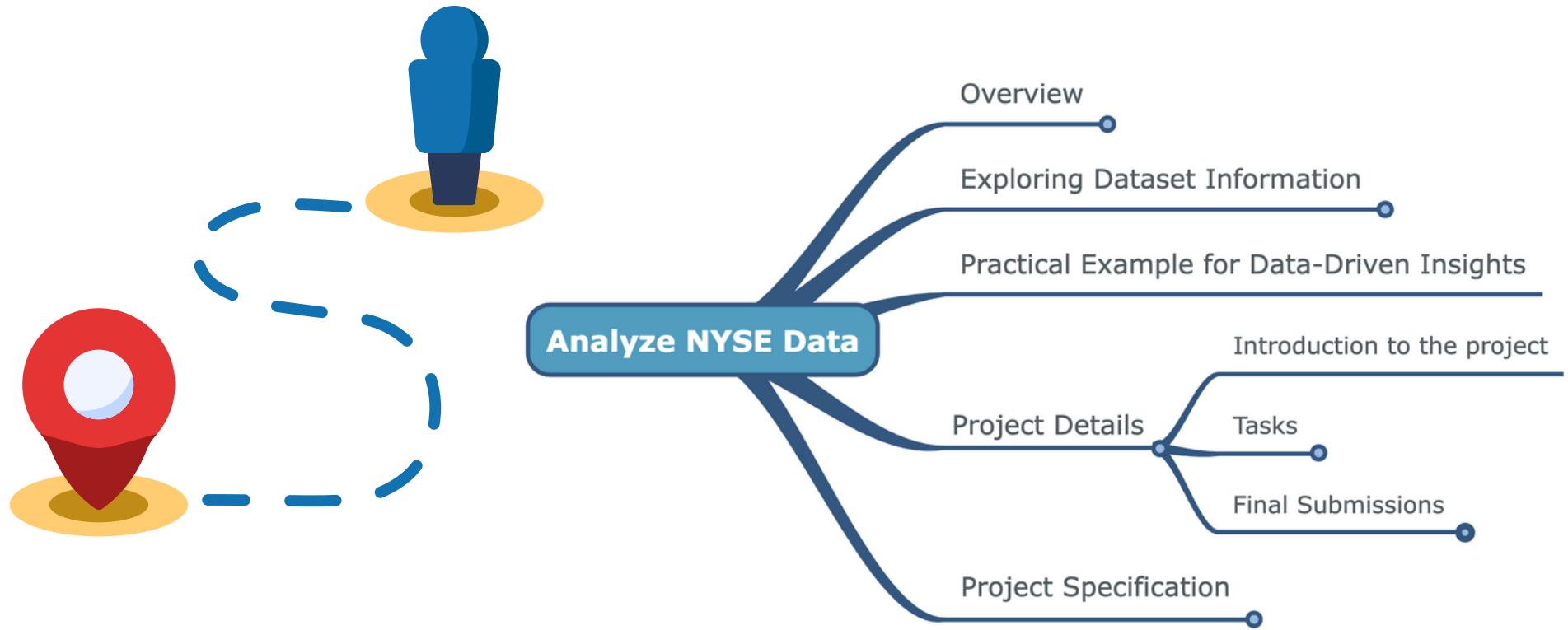


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Behind every data point, there's a story waiting to be told.

# ROADMAP

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# OVERVIEW

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# NEW YORK STOCK EXCHANGE S&P 500 DATASET

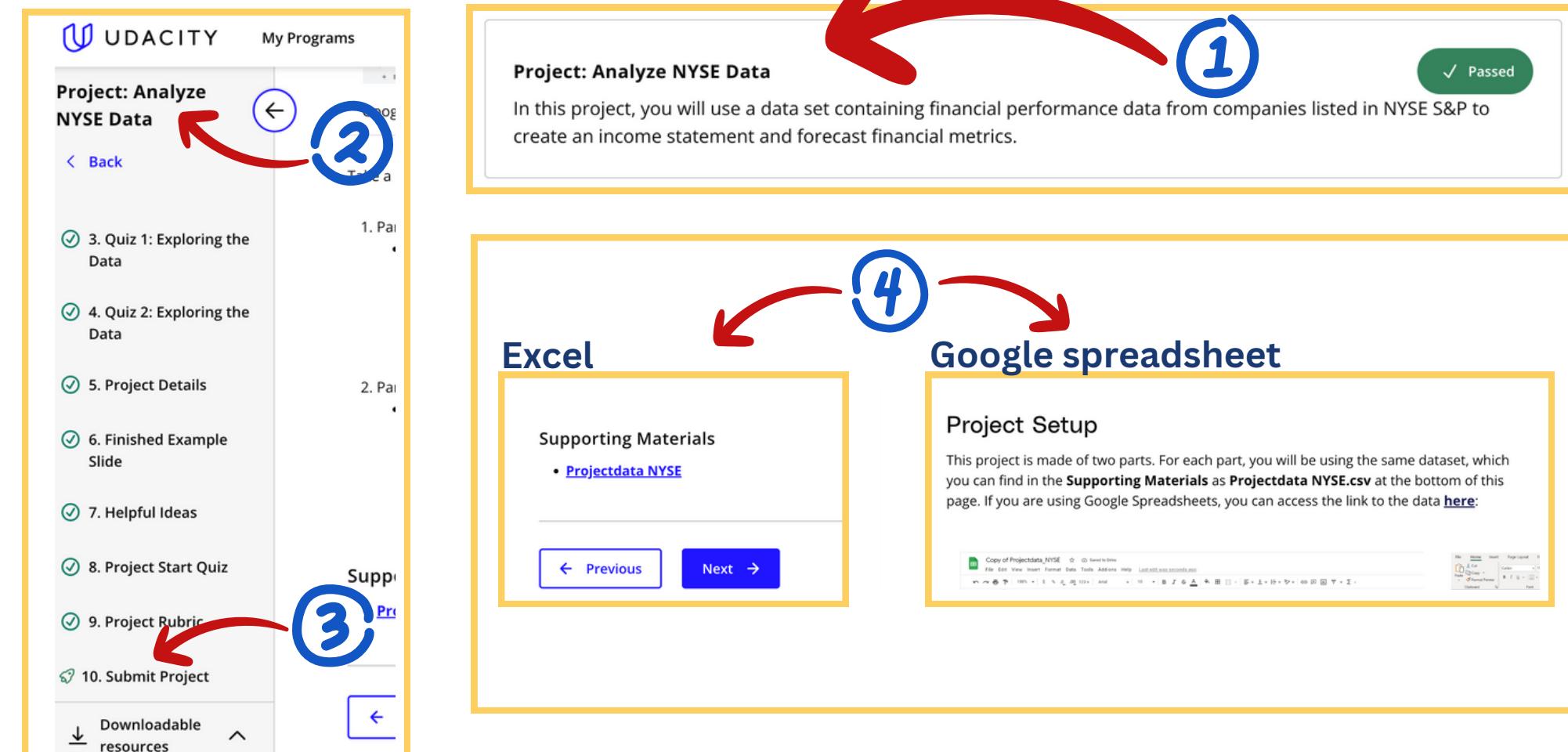
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The project involves analyzing real-life data from the New York Stock Exchange (NYSE).

The dataset is a subset of a larger dataset obtained from Kaggle, which includes historical financial data from S&P 500 companies.

The project focuses on using this smaller dataset for analysis purposes.

# DOWNLOAD DATASET



# DATASET INFORMATION

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- **Ticker symbol:** Stock identifier.
- **Years:** Timeframe covered.
- **Period ending:** Conclusion date.
- **Total revenue:** Overall income.
- **Cost of goods sold:** Expenses for goods. Sales, General, and  
**Administrative expenses:** Costs for sales and operations.
- **Research and Development expenses:** Expenditures for innovation.
- **Other Operating expense items:** Additional operational costs.
- **GICS Sector:** Industry classification.
- **GICS Sub Industry:** Further industry categorization.

# PROJECT DETAILS

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# INTRODUCTION TO THE PROJECT

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The final project involves three tasks: data analysis with a presentation, creating a Profit and Loss Statement dashboard, and developing a Financial Forecasting Model using three scenarios.

Start by examining the dataset and selecting a sub-category and company for analysis.

There is no definitive solution as the project is open-ended.

# TASKS

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# TASK 1

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# TASK 1

- Identify question for data analysis
- Include categorical and quantitative variables
- Use summary statistics

**Do students who study more hours per week get higher grades?**

In this question:

1. We are looking at two things: "how many hours a student studies each week" and "the grades they get".
2. To answer this question, we might ask students about their study habits and also look at their grades.
3. Then, we will check if students who study more really do get better grades.
4. If they do, this could tell us that studying more helps improve grades.

**Does the type of breakfast a student eats (cereal, fruit, eggs, or none) affect their performance on a math test?**

In this question:

1. We are looking at two things: "how many hours a student studies each week" and "the grades they get".
2. To answer this question, we might ask students about their study habits and also look at their grades.
3. Then, we will check if students who study more really do get better grades.

**What is the most common color of car in our town?**

In this question:

1. "Color of car" is a categorical variable, because color is a category, not a number.
2. To answer this question, you might count cars in various parts of the town and note their color.
3. The most common color (the mode in statistical terms) is the summary statistic we're interested in.
4. Knowing this could be interesting for car dealers or advertisers in your town.

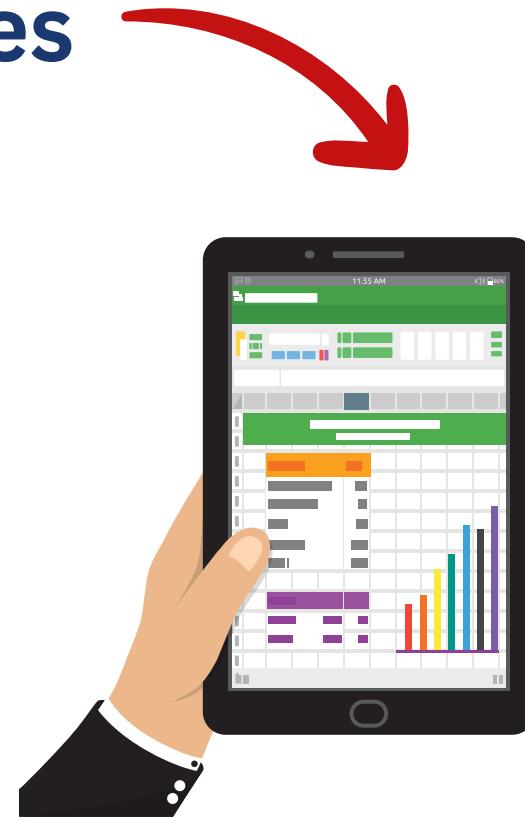
# TASK 1



## Deliverables



Slide presentation



Spreadsheet with summary statistics

# TASK 2

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# TASK 2

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- Create Profit and Loss (P&L) dashboard
- Calculate Gross Profit, Operating Profit, or EBIT
- Include all companies from dataset

# TASK 2

## Create Profit and Loss (P&L) dashboard

**The Profit and Loss Statement is a document that informs you if your enterprise (in this context, the small ice cream stand) earned a profit (made money) or incurred a loss (lost money).**

1. **Revenues:** This is the money you make from selling ice cream. Say you sell 200 ice cream cones at \$3 each, your revenue is \$600.
  2. **Cost of Goods Sold (COGS):** This is the cost of making the ice cream and buying the cones. So if you spent \$150 on dairy products, sugar, flavorings, and cones, this is your COGS.
  3. **Gross Profit:** This is what you get when you subtract COGS from Revenues. So if your revenue was \$600 and your COGS was \$150, your gross profit is  $\$600 - \$150 = \$450$ .
  4. **Selling, General, and Administrative expenses (SGAs):** These are costs like marketing (maybe you spent \$50 on social media ads) and salaries (you paid a friend \$100 to help you sell the ice cream).
  5. **Operating Expenses:** These are costs that aren't directly related to making ice cream but are necessary for running the stand. For example, you paid \$50 for a permit to have your stand at a local park.
  6. **Total Operating Expenses:** This is just the SGAs and Operating Expenses added together. So  $\$50 \text{ (ads)} + \$100 \text{ (salary for your friend)} + \$50 \text{ (permit)} = \$200$ .
  7. **Operating Income:** This is your Gross Profit minus your Total Operating Expenses. So  $\$450 \text{ (gross profit)} - \$200 \text{ (total operating expenses)} = \$250$ .
  8. **Net Income:** This is your Operating Income minus any additional costs, like taxes. For a small ice cream stand, taxes might be minimal or non-existent, but let's say you paid \$20 in small business taxes, so your Net Income would be  $\$250 - \$20 = \$230$ .
- So, if everything goes as planned, your small ice cream stand could make a net income of \$230 per day. Of course, these numbers are just hypothetical, and your actual costs and revenues could be different.



# TASK 2

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## Calculate Gross Profit, Operating Profit, or EBIT

To calculate the Gross Profit, Operating Profit (also known as EBIT, Earnings Before Interest and Taxes), you need specific financial information about a company.

1. **Income Statement (P&L).**
2. **Operating Statistics:** These are ratios to help understand the business's performance.
  - **Revenue growth (%)**: How much the revenue has increased each year. It was 15% from year 1 to year 2, meaning the total income from selling ice cream increased by 15%.
  - **Gross margin**: This is the Gross Profit divided by Revenue. It shows how much of each dollar of revenue is left over after paying the cost of making the ice cream (COGS). The higher this number, the more efficient the production process. It was 0.91 in year 1 and year 2, meaning 91 cents of every dollar of income was profit after paying for the cost of making the ice cream.
  - **Operating margin**: This is the Operating Income divided by Revenue. It shows how much of each dollar of revenue is left over after all operating expenses. It was 0.16 in year 1, meaning 16 cents of every dollar of income was profit after all operating expenses.
3. **Scenarios:** These are predictions of the future based on different circumstances.
  - **Base case**: This is the expectation if things continue as they are now.
  - **Strong case**: This is the expectation if things go better than expected, like more customers buying or lower costs.
  - **Weak case**: This is the expectation if things don't go as well as planned, like fewer customers or higher costs.Each scenario has different predicted growth rates and margins.

# TASK 2



The screenshot shows a Microsoft Excel spreadsheet with a table of salesperson data. A dropdown menu is open over the first cell of the 'Salesperson' column (cell A3). A red arrow points from the top right towards the 'Data Tools' button in the ribbon. Another red arrow points from the bottom left towards the 'Source' field in the 'Data Validation' dialog box, which is overlaid on the spreadsheet. The dialog box shows 'List' selected under 'Allow' and the range '\$I\$3:\$I\$15' entered in the 'Source' field. The table data is as follows:

Salesperson	Department	Target (min=5 max=25)	Total Sales	Date	Initials (3 letters)	Approved List
Adrian	B	10	500			Adrian
Ben	B	12	600			Ben
Claire	C	8	400			Claire
David	C	15	750			David
Emily	A	6	300			Emily
Frank	C	5	250			Frank
Graham	C	2	100			Graham
Henry	C	5	250			Henry
Ingrid	B	7	350			Ingrid

## Include all companies from dataset

Perform a calculation based on the selected Ticker Symbol

### 1. Create a dropdown list with the unique Ticker Symbols:

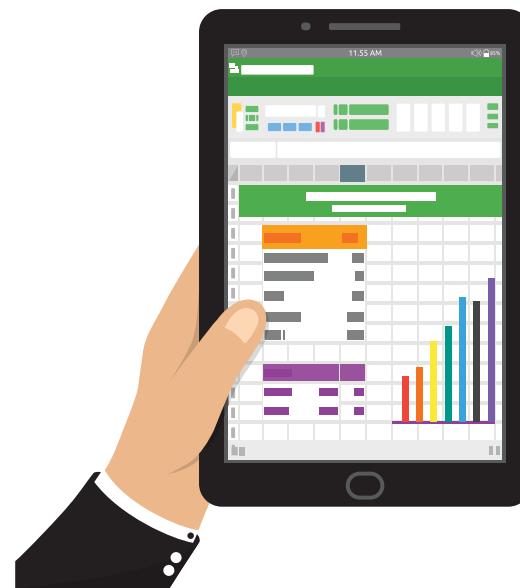
- o Choose a cell where you want to create a dropdown list.
- o Go to the Data tab again, click on "Data Validation".
- o In the Data Validation window, under "Allow", select "List".
- o In the "Source" box, select the range of cells that contain your unique Ticker Symbols.
- o Click "OK". Now you should have a dropdown list in your selected cell.

# TASK 2

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## Deliverables



Spreadsheet with dynamic P&L  
statement

# TASK 3

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# TASK 3

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- Create financial forecasting model
- Select a company
- Forecast Gross Profit, Operating Profit, or EBIT for 2 years
- Use three scenarios (Best case, Weak case, and Base case)
- Assumptions change for each scenario
- Forecast Gross Profit, Operating Profit, or EBIT for 2 years

# TASK 2

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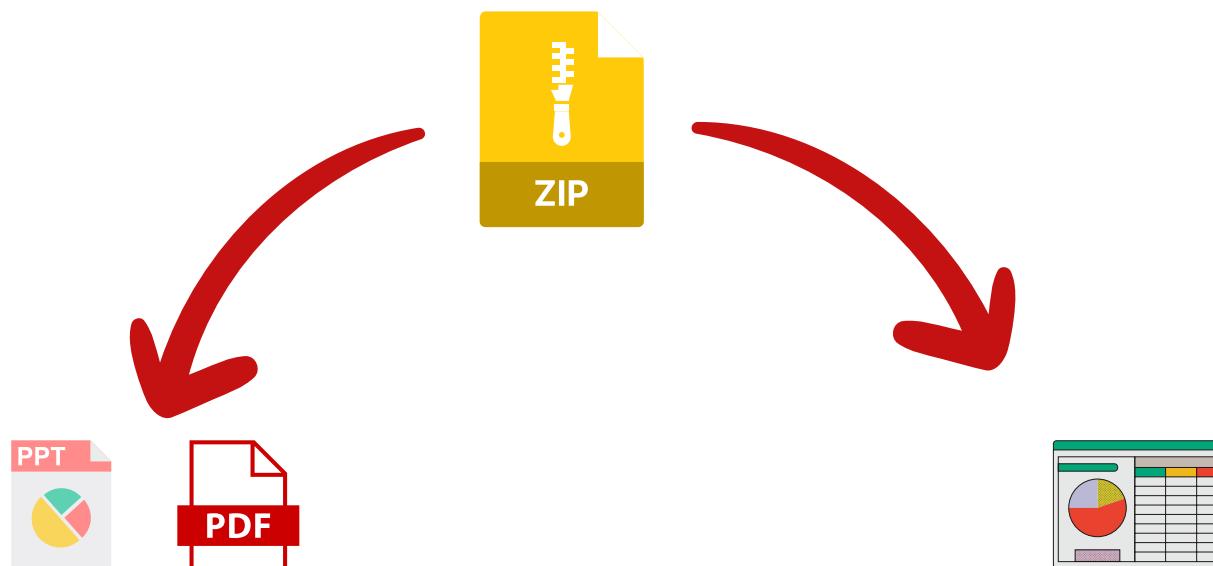
## Deliverables



Spreadsheet with forecasting model

# FINAL SUBMISSIONS

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Presentation with visuals and summary (pdf or ppt)

Spreadsheet workbook with tabs:

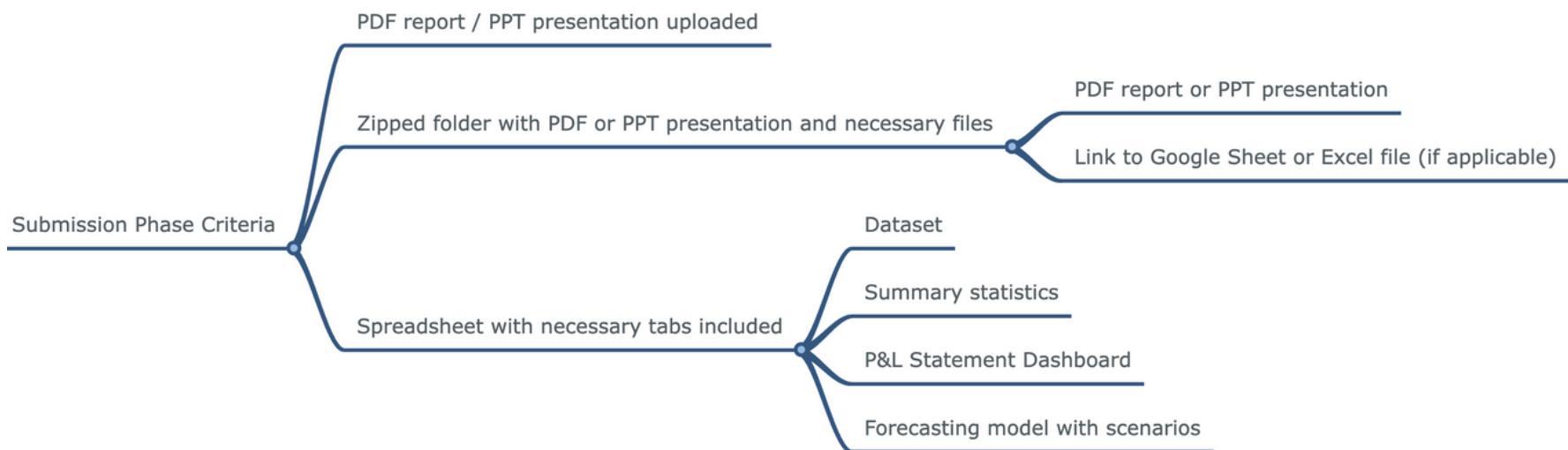
1. Raw data
2. Summary statistics
3. P&L Statement Dashboard
4. Forecast scenarios

# PROJECT SPECIFICATION

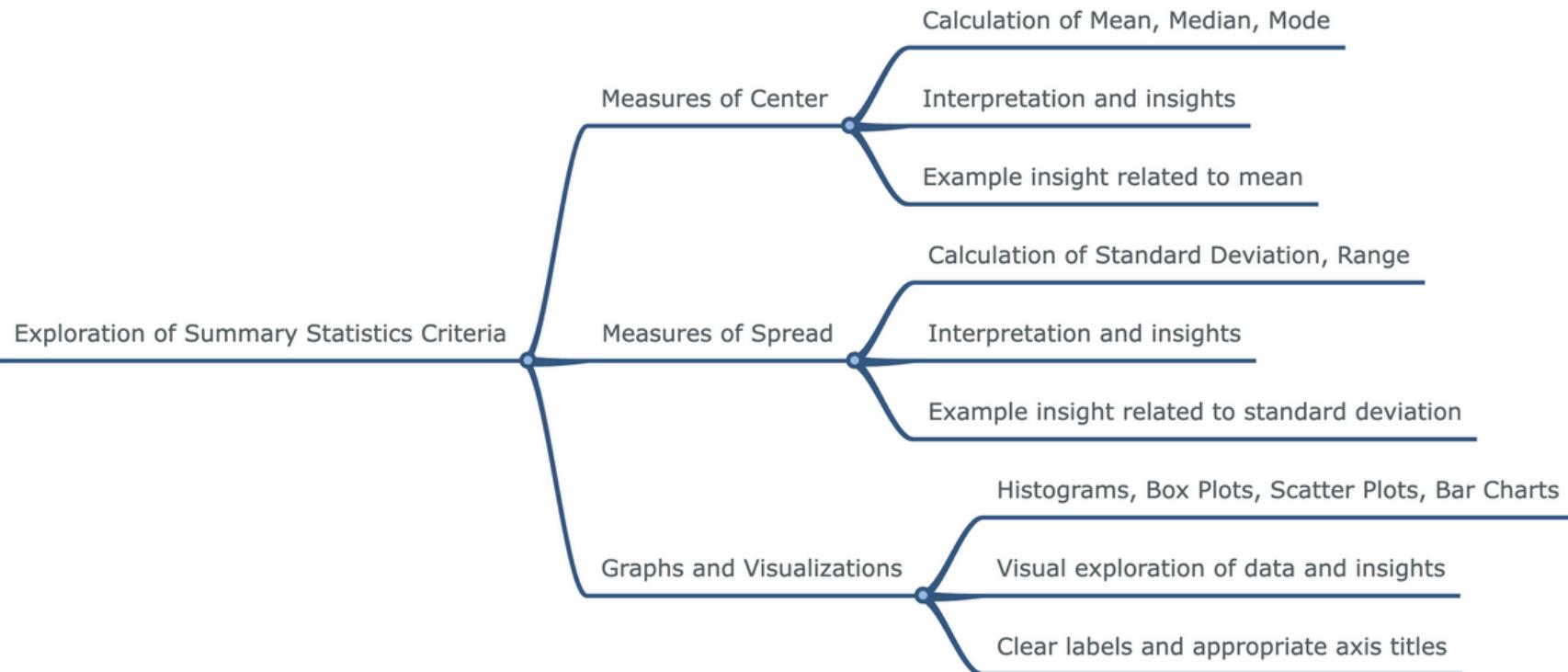
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# SUBMISSION PHASE CRITERIA

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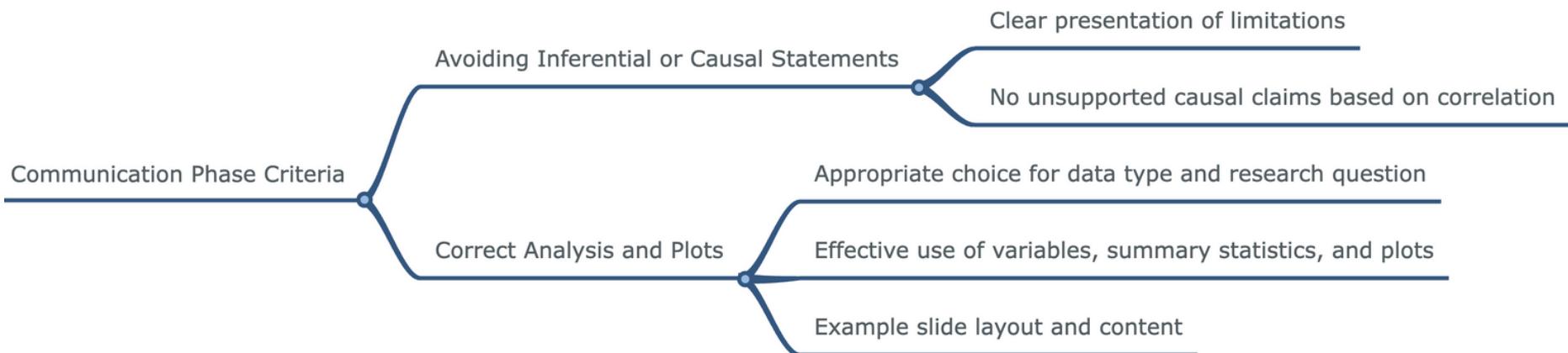


# EXPLORATION OF SUMMARY STATISTICS CRITERIA



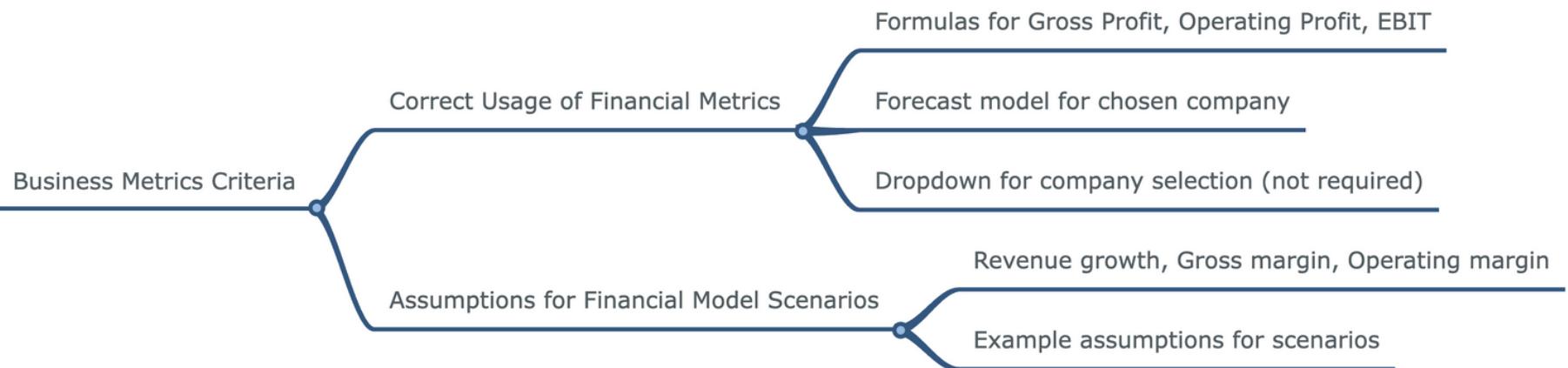
# COMMUNICATION PHASE CRITERIA

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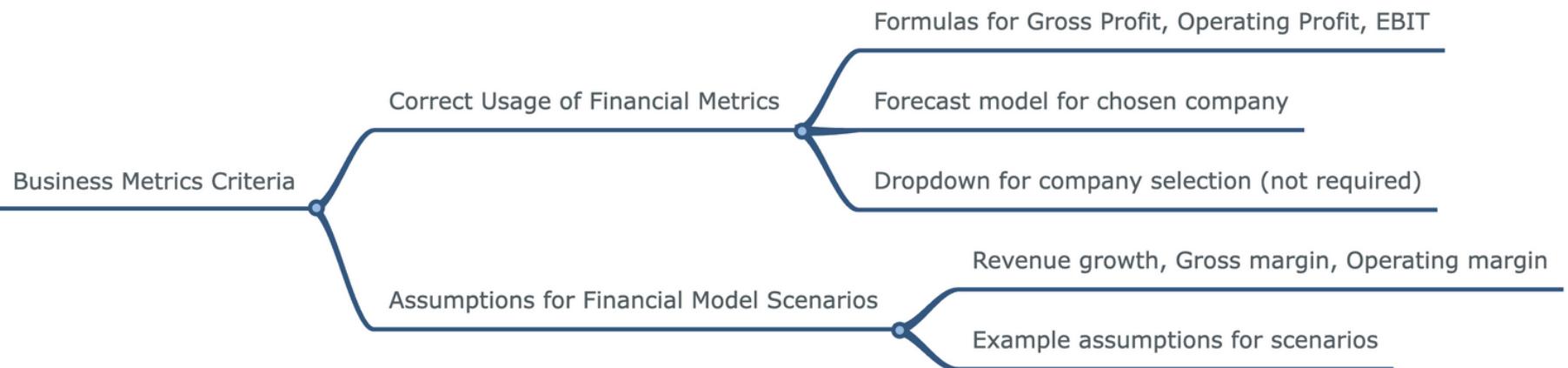
# BUSINESS METRICS CRITERIA

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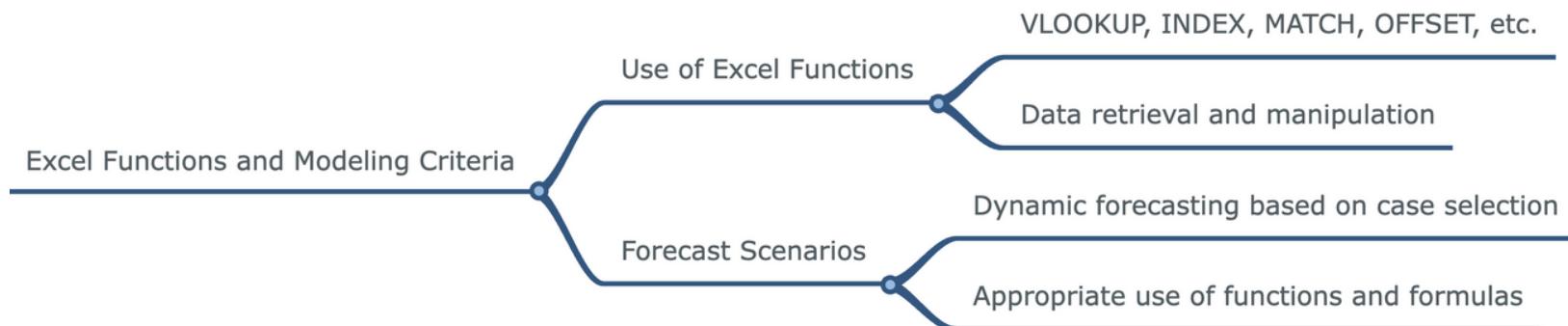
# BUSINESS METRICS CRITERIA

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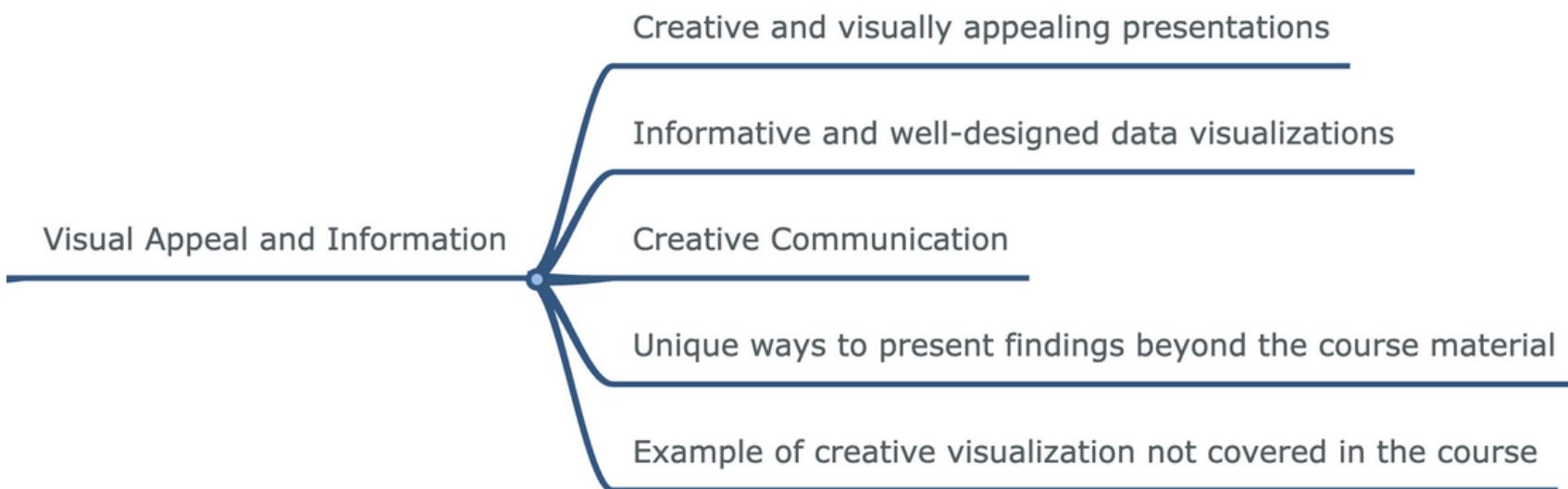
# EXCEL FUNCTIONS AND MODELING CRITERIA

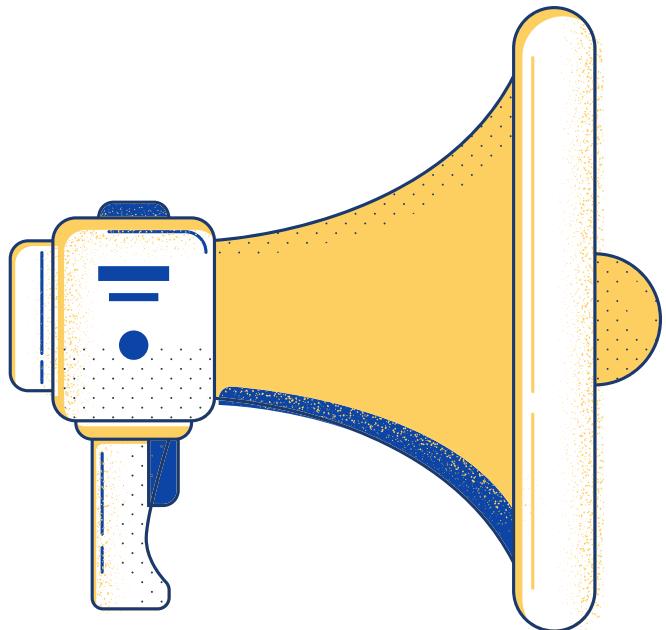
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# SUGGESTIONS TO MAKE YOUR PROJECT STAND OUT!

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**Q&A Session:**  
**Let's explore and**  
**understand**  
**together**

# RESOURCES

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- [Analyze NYSE Data](#)
- [Index & Match and Offset & Match explanation](#)



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Your presence today has added value  
to our shared learning journey. Thank  
you for joining us!