Task 1: A customer has a budget of 350,000 PLN and wants an EV with a minimum range of 400 km. A) Your task is to filter out EVs that meet these criteria.

use **filtering method** or **selection method**.

Technically, it's a form of **constraint-based filtering** because you're applying two specific constraints (price and range) to select the options.

In data processing terms, you could also call it a **filter** or **query** operation.

b) Group them by the manufacturer

- Filtering (select EVs meeting budget and range criteria).
- Grouping (organize the filtered EVs based on the **manufacturer**).

C) Calculate the average battery capacity for each manufacturer.

- **Filtering** (selecting EVs that meet budget and range conditions) → **Constraint-based filtering**.
- **Grouping** (arranging EVs by manufacturer) → **Grouping** or **categorization**.
- **Aggregation** (computing average battery capacity) → **Aggregation** or **statistical summarization**.

Task 2: You suspect some EVs have unusually high or low energy consumption. Find the outliers in the mean- Energy consumption [kWh/100 km] column

- **Outlier Detection** method.
- You can use techniques like:
  - **Statistical methods** (e.g., values beyond 1.5×IQR — interquartile range — from the quartiles).
  - **Z-score method** (values with a Z-score above 3 or below -3).
  - **Visualization methods** (like **box plots** to spot outliers visually).

Task 3: Your manager wants to know if there's a strong relationship between battery capacity and range. a) Create a suitable plot to visualize.

This is a **relationship analysis** or **correlation analysis**.

- You are using **data visualization** to check the strength and direction of the relationship.

Specifically:

- **(a) Suitable plot:**
  - A **scatter plot** is the best choice here!
    - X-axis: **Battery Capacity (kWh)**
    - Y-axis: **Range (km)**

- Optionally, you can also add a **trendline** (like a linear regression line) to make the relationship even clearer.

b) Highlight any insights

Insights:

- After plotting, you would look for:
  - Is there a **positive correlation**? (Higher battery = longer range?)
  - Is it a **strong** or **weak** relationship?
  - Are there any **outliers**? (Cars with big batteries but short range or vice versa?)

Task 4: Build an EV recommendation class. The class should allow users to input their budget, desired range, and battery capacity. The class should then return the top three EVs matching their criteria

Class construction → You are using **object-oriented programming (OOP)** to organize the solution.

- **Filtering** → You apply **constraint-based filtering** to find EVs that match the user's budget, range, and battery capacity conditions.
- **Sorting** → After filtering, you **sort** the EVs (for example, based on range or price) to find the "top" options.
- **Recommendation logic** → Selecting the **top 3** results based on the sorted list is a form of **recommendation algorithm**, though it's basic (not machine learning-based).

Task 5: Inferential Statistics– Hypothesis Testing: Test whether there is a significant difference in the average Engine power [KM] of vehicles manufactured by two leading manufacturers i.e. Tesla and Audi. What insights can you draw from the test results? Recommendations and Conclusion: Provide actionable insights based on your analysis. (Conduct two sample t-test using ttest_ind from scipy.stats module)

This is an **Inferential Statistics** method, not just descriptive.

Specifically:

- **Two-sample t-test** → a type of **hypothesis test** used to compare **the means of two independent groups**.
- You are checking if the **mean engine power** of Tesla vehicles is **significantly different** from that of Audi vehicles.