Assignment - 1

Principles of Data Science

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Plot 1:

Boxplot: Grip Strength by Frailty

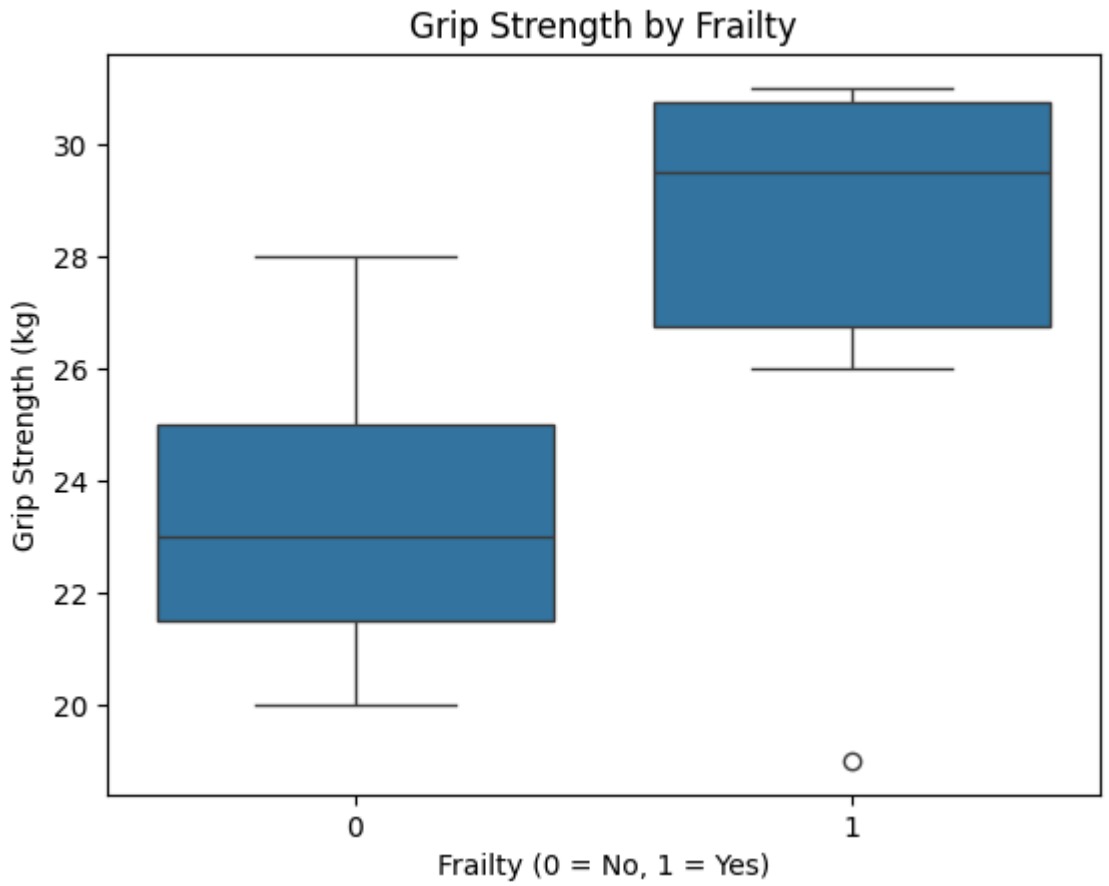
Description:

- This boxplot compares the **distribution of grip strength** between frail (1) and non-frail (0) participants. Each box represents the range of grip strength values for a given frailty category.
- The **box** shows the interquartile range (IQR) where the middle 50% of values lie, while the **whiskers** extend to the minimum and maximum values. Outliers, if any, are shown as points outside the whiskers.

Interpretation:

- Typically, if the boxplot shows that the **frail** participants have a **lower median grip strength** and a smaller IQR than the non-frail group, it suggests that frail individuals have significantly weaker grip strength.
- If the box for the **non-frail** group is positioned higher (with a larger IQR), this shows that non-frail individuals tend to have stronger and more varied grip strength compared to frail individuals.

This plot is useful for visualising the **differences in grip strength** between the two groups, showing if frail individuals consistently have lower grip strength.



Plot 2:

Pie Chart: Distribution of Frailty

Description:

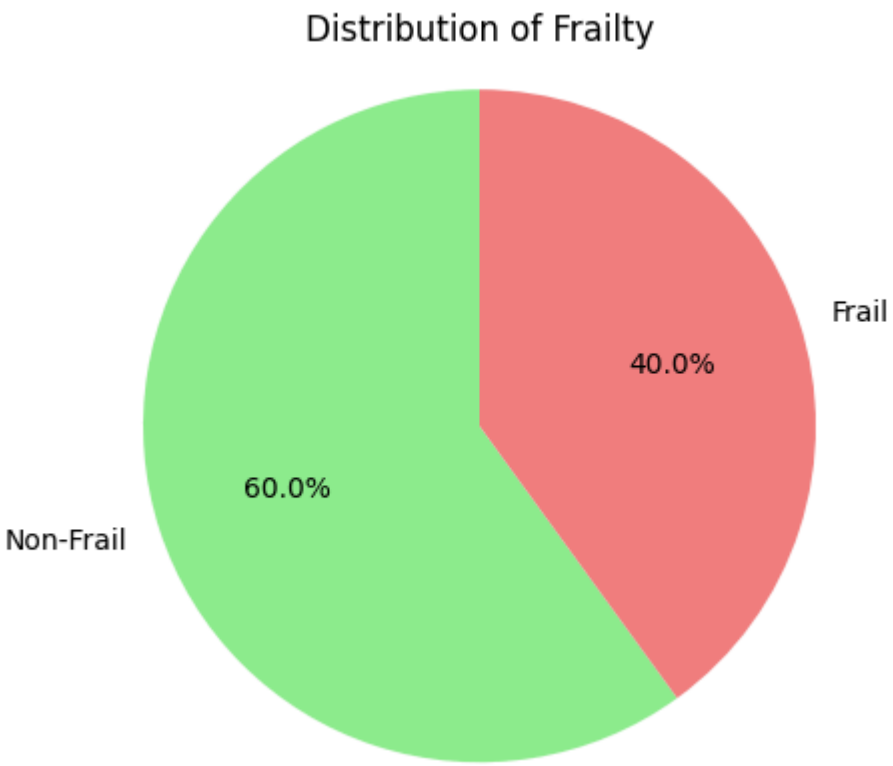
- This pie chart visualises the distribution of **frailty** in the dataset, dividing participants into two categories: **frail (1)** and **non-frail (0)**.
- The chart shows the proportion of participants who are frail versus those who are not.

Interpretation:

- The **"Non-Frail"** group is larger in proportion than the **"Frail"** group, indicating that more participants are healthy (not exhibiting frailty) than those who are frail.

- If the pie chart shows that frail individuals make up, for example, 40% of the total, this suggests that nearly half of the participants are at risk of frailty, which could be significant when assessing overall population health.

This chart provides a quick, visual snapshot of how frailty is distributed in the sample population.



Plot - 3

Line Graph: Grip Strength vs Age

Description:

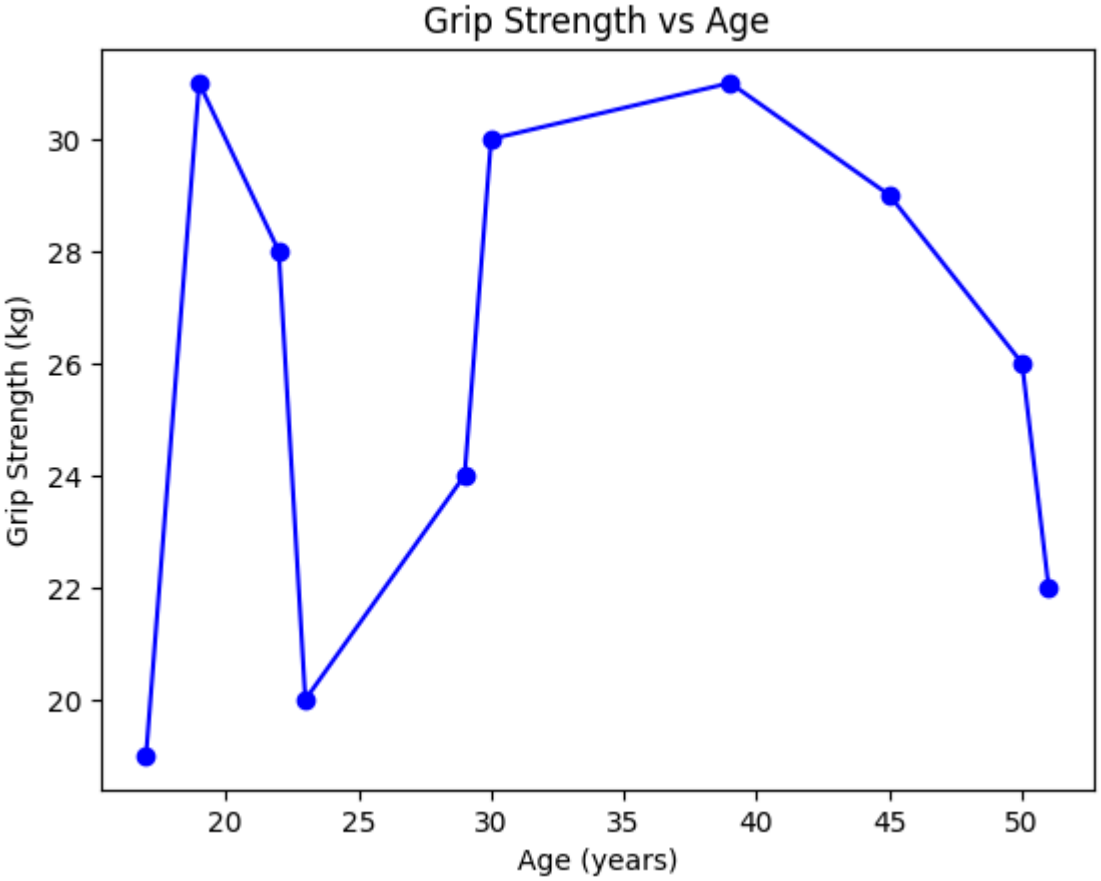
- The line graph displays the relationship between **age** (on the x-axis) and **grip strength** (on the y-axis).

- Each point on the graph represents a participant's grip strength corresponding to their age, and the line connects these points to show the trend as age increases.

Interpretation:

- A **downward trend** may indicate that grip strength generally decreases as participants age, which aligns with common findings in gerontological research.
- The presence of individual data points along the line (via markers) shows variability in grip strength at different ages. For example, grip strength might drop significantly after a certain age, reflecting possible aging effects.

This graph helps to visualise how grip strength correlates with aging, providing insight into whether grip strength decreases significantly in older participants.


Grip Strength vs Age
Grip Strength (kg)
30
28
26
24
22
20
20
25
30
35
40
45
50
Age (years)