09-26-2024

Principles of Data Science

Assignment -1

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Question 1: Here I am performing the Data cleaning and Data analysis on the Frailty data set.

- **Frailty Raw Data**

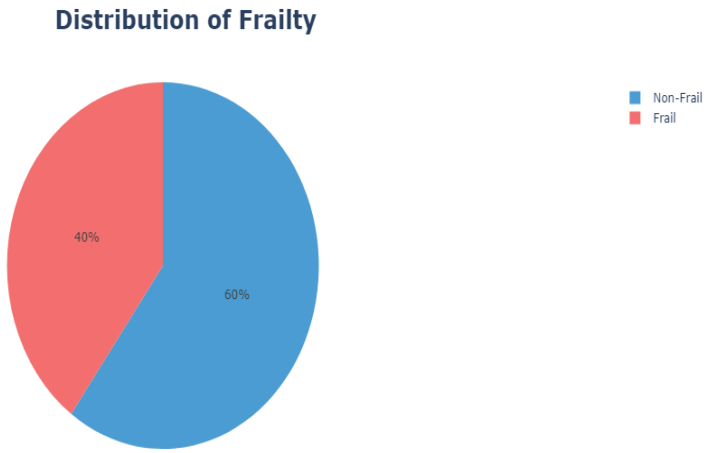
Height (Inches)	Weight (Pounds)	Age	Grip strength	Frailty
65.8	112	30	30	N
71.5	136	19	31	N
69.4	153	45	29	N
68.2	142	22	28	Y
67.8	144	29	24	Y
68.7	123	50	26	N
69.8	141	51	22	Y
70.1	136	23	20	Y
67.9	112	17	19	N
66.8	120	39	31	N

- **Cleaned Data**

```
Cleaned_Frailty = pd.read_csv('/content/Frailty_Cleaned_Dataset.csv')
Cleaned_Frailty
```

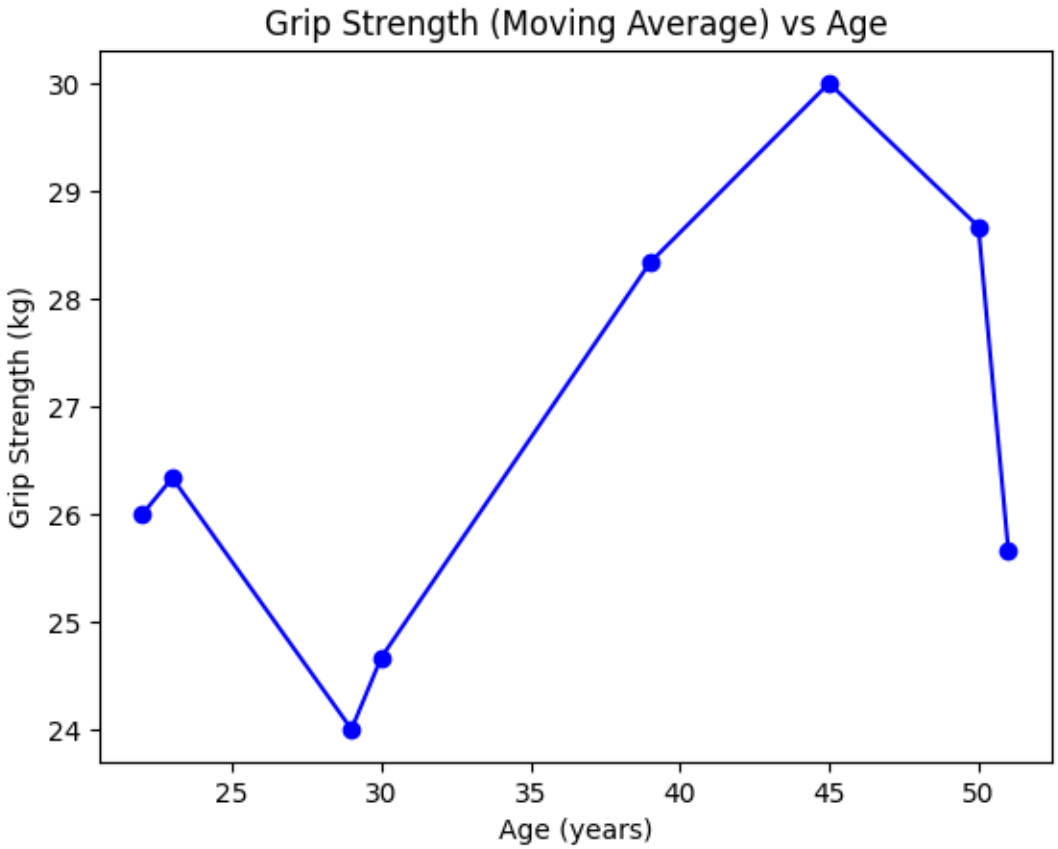
	Height (Inches)	Weight (Pounds)	Age	Grip strength	Frailty
0	67.9	112	17	19	1
1	71.5	136	19	31	1
2	68.2	142	22	28	0
3	70.1	136	23	20	0
4	67.8	144	29	24	0
5	65.8	112	30	30	1
6	66.8	120	39	31	1
7	69.4	153	45	29	1
8	68.7	123	50	26	1
9	69.8	141	51	22	0

- **Distribution of Frailty:**



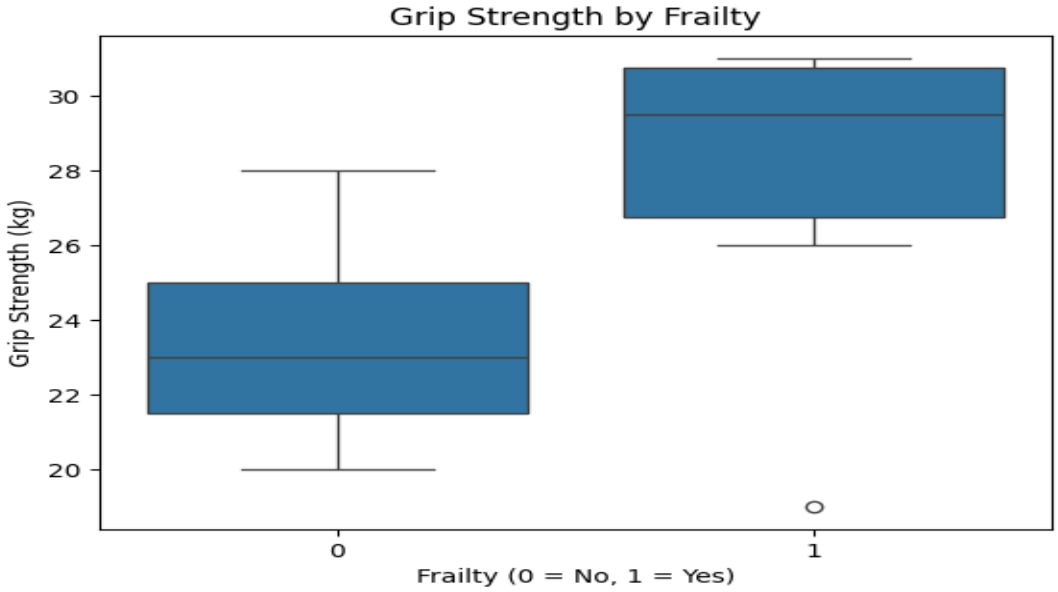
The Above pie chart depicts the percentage of Frailty, blue represents the 60% of non-frailty and red represents the percentage of Frail (40%).

- **Comparison of Grip strength by Age:**



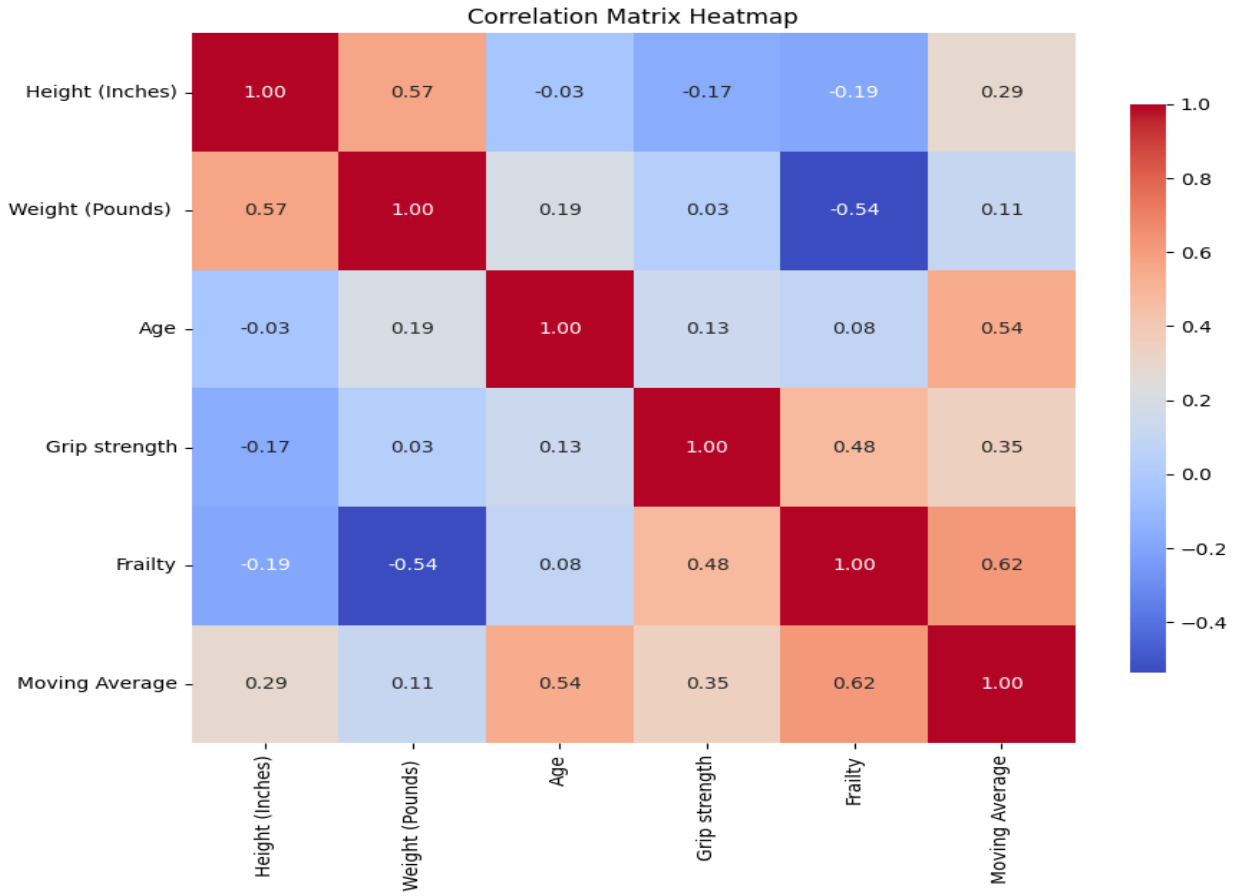
The above graph shows a line plot of the moving average of grip strength versus age. It illustrates that grip strength fluctuates over time, with a significant drop around age 30, then a rise peaking around age 45, followed by a decline towards age 50.

- **Box Plot of Grip Strength by Frailty:**



The box plot shows that individuals classified as frail (1) tend to have significantly higher grip strength compared to non-frail individuals (0), with a wider range of values in the frail group.

- **Correlation Matrix:**



Key insights include:

- **Height and Weight** show a moderate positive correlation (0.57).
- **Weight and Frailty** have a strong negative correlation (-0.54), suggesting that as weight increases, frailty decreases.
- **Age and Moving Average** have a moderate positive correlation (0.54), implying a general trend where age is positively associated with the moving average.
- **Grip strength and Frailty** are moderately correlated (0.48), indicating that stronger grip strength is related to lower frailty.
- **Frailty and Moving Average** have the strongest positive correlation (0.62), suggesting that frailty tends to increase with higher moving averages of grip strength over time.