Aim Lab Data Cleaning and Visualisation

1. Project Description:
Aim Lab is an online aim training software program for PC competitive video games. I extracted data from my Aim Lab profile, and then cleaned and visualised the data using Pandas and Matplotlib. The goal was to gain experience in using Matplotlib and Pandas in a self-guided environment, and display my aim improvement over time.

2. Problem Statement:
This project aimed to address my lack of experience in utilizing Matplotlib and Pandas in a self-guided setting. The availability of Aim Lab data provided an engaging opportunity to apply these tools effectively. With Aim Lab already offering in-software statistics, the project sought to explore and visualize this data in a more informative and customized manner.

3. Solution Implementation:
Upon opening the data frame initially I could see several things wrong. Incorrect column titles, useless columns which no meaning can be derived from (e.g., Map: v0.98.5.-5103, which is not relevant as Aim Lab tasks are differentiated by their task name), and null values.
The solution goes as follows:
1. Imported Pandas and Matplotlib libraries
2. Used df.drop to remove all useless columns (e.g., weapon name, mode, map, version)
3. Then df.rename to rename all the columns appropriately (e.g., 'accTotal': 'Accuracy Rate')
4. I started visualising using Matplotlibs, df.plot.line, set_xlim and plt.show
5. Then I faced the biggest problem. Upon visualising, some of my visuals were not adding up. I noticed halfway down the rows, 2 columns had been swapped in the original data, so I had to swap them back to the correct columns. The solution was:
df.iloc[row:, [column1, column2]] = df.iloc[row:, [colunmn2, column1]]
6. Now all my visualisations made sense, and I plotted over time: Total hits, Hits per second, Accuracy Rate, Total Shots and Reaction Time.
7. Visualisations were inspected to determine trends over time.

4. Results and Impact:
In alignment with the project's objectives, the outcomes were as anticipated. The project provided me with the valuable opportunity to apply Pandas and Matplotlib in a self-guided context, significantly enhancing my data cleaning and visualization skills. It also offered me unique insights into my personal growth in terms of aiming proficiency.

Four out of five graphs exhibited a consistent increase in values over the ten-month period, while one graph, Reaction Time, displayed a gradual decrease. These results demonstrate progress in my aiming skills across a range of standardized metrics over the ten-month period.

5. Technical Skills Demonstrated:
Python, Pandas, Matplotlib, Jupyter Notebook, Data cleaning, Data visualisation, Data analysis

6. GitHub Repository:
https://github.com/Davidooj/Projects/tree/main/AimLab

7. Key Takeaways:

Leveraging Pandas for Scalable Data Cleaning: This project highlighted to me the scalability of using Pandas for data cleaning, underlining its potential as a valuable tool for handling and processing data efficiently.

The Power of Intense Deliberate Practice: The project's findings reinforce the notion that engaging in intense deliberate practice, particularly at the boundary of one's skill level, yields performance improvements. This principle holds true not only in the realm of programming but also in competitive video games. Even in domains where expertise has been developed and progress may seem slow, a constant pushing of one's skill boundaries leads to visible improvements, as demonstrated by the data.