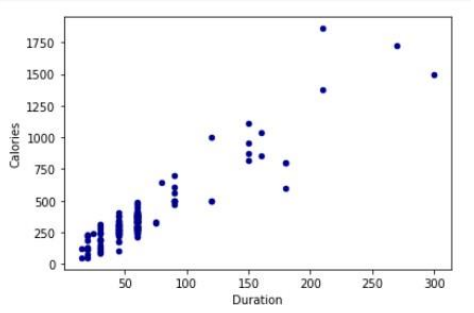
Spring 2023: Machine Learning 5710
(Assignment 4)

Programming elements:
Classification

1. Pandas

1. Read the provided CSV file 'data.csv'.
   https://drive.google.com/drive/folders/1h8C3mLsso-R-sIOLsvoYwPLzy2fJ4IOF?usp=sharing
2. Show the basic statistical description about the data.
3. Check if the data has null values.
   a. Replace the null values with the mean
4. Select at least two columns and aggregate the data using: min, max, count, mean.
5. Filter the dataframe to select the rows with calories values between 500 and 1000.
6. Filter the dataframe to select the rows with calories values > 500 and pulse < 100.
7. Create a new "df_modified" dataframe that contains all the columns from df except for "Maxpulse".
8. Delete the "Maxpulse" column from the main df dataframe
9. Convert the datatype of Calories column to int datatype.
10. Using pandas create a scatter plot for the two columns (Duration and Calories).
    a. Example:



1. (Titanic Dataset)

1. Find the correlation between 'survived' (target column) and 'sex' column for the Titanic use case in class.
   a. Do you think we should keep this feature?
2. Do at least two visualizations to describe or show correlations.
3. Implement Naïve Bayes method using scikit-learn library and report the accuracy.

2. (Glass Dataset)

1. Implement Naïve Bayes method using scikit-learn library.
   a. Use the glass dataset available in Link also provided in your assignment.
   b. Use **train_test_split** to create training and testing part.
2. Evaluate the model on testing part using score and

```
classification_report(y_true, y_pred)
```

1. Implement linear SVM method using scikit library
    a. Use the glass dataset available in Link also provided in your assignment.
    b. Use **train_test_split** to create training and testing part.
2. Evaluate the model on testing part using score and

```
classification_report(y_true, y_pred)
```

Do at least two visualizations to describe or show correlations in the Glass Dataset.

Which algorithm you got better accuracy? Can you justify why?

** Follow the IPC rubric guidelines.

Submission Guidelines:

1. Once finished present your work during class time.
2. Once evaluated submit your source code and documentation to GitHub and represent the work in a ReadMe file properly (short summary for the ICP).

After class submission:

1. Complete your work and submit to your repo before the deadline.
2. Record a short video (1~3) minute, explaining the technical part and method used.
3. Add video link to ReadMe file.