Project 1 – Penguin Dataset

About the dataset:

Please refer to the official Github page for details and license information. The details below have also been taken from there.

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Palmer Archipelago (Antarctica) penguin data: Data were collected and made available by Dr. Kristen Gorman and the Palmer Station, Antarctica LTER, a member of the Long Term Ecological Research Network. Thank you to Dr. Gorman, Palmer Station LTER and the LTER Network! Special thanks to Marty Downs (Director, LTER Network Office) for help regarding the data license & use.

License & citation

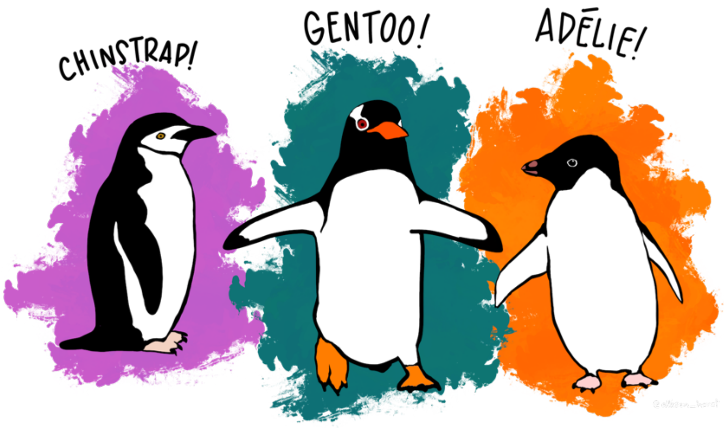
- Data are available by CC-0 license in accordance with the Palmer Station LTER Data Policy and the LTER Data Access Policy for Type I data.
- Please cite this data using: Gorman KB, Williams TD, Fraser WR (2014) Ecological Sexual Dimorphism and Environmental Variability within a Community of Antarctic Penguins (Genus *Pygoscelis*). PLoS ONE 9(3): e90081. doi:10.1371/journal.pone.0090081

Summary:

The data folder contains a csv file: penguins_size.csv

- penguins_size.csv: Simplified data from original penguin data sets. Contains variables:
  - species: penguin species (Chinstrap, Adélie, or Gentoo)
  - culmen_length_mm: culmen length (mm)
  - culmen_depth_mm: culmen depth (mm)
  - flipper_length_mm: flipper length (mm)
  - body_mass_g: body mass (g)
  - island: island name (Dream, Torgersen, or Biscoe) in the Palmer Archipelago (Antarctica)
  - sex: penguin sex

Meet the penguins:



What are culmen length & depth?

The culmen is "the upper ridge of a bird's beak" (definition from Oxford Languages).

Task: Predict the class of penguin species

Questions to Answer:

- Perform a detailed exploratory data analysis on the dataset
- Experiment using two different ratios of training, validation and test data ie 60-20-20 & 80-10-10. On the two different split ratios do the following
    - Implement Grid Search CV to find optimal hyperparameters for any 3 algorithms (out of LR, SVM, MLP, RF, Boosting)
    - Plot the learning curve using the learning curve function from scikit-learn to analyze the model performance. The plot should show the training score and cross validation score against the number of training examples.
    - Analyze the results on Validation set and Test set and mention which model performed the best and why?
    - Compare the performance of models(using precision, recall, accuracy, latency).
- What was the best proportion or split ratio of data from the set of experiments you conducted and why?

Submission Instructions: Please just submit one jupyter notebook containing all the code and make use of markdown cells to include the comments, answers, reasoning, analysis, etc.

Note: Name of your file should be your "Project1-id_Firstname_Lastname.ipynb"