120 Dog Breed Classification

Dataset: https://www.kaggle.com/datasets/amandam1/120-dog-breeds-breed-classification

In this project, you will be trying to create a model to classify the dog breeds using the dataset given above. The aim of the project is to classify the dog's breed using the dataset which consists of 120 files. While creating the project, try to follow the instructions below and make sure that the project is unique.

1. Creating a Google Colaboratory File

● Make sure your project has .ipynb extension.
● Make sure that there are comment lines explaining the details in your project.
● When submitting the project, submit the cells of this .ipynb file so that the cells are run and the results are visible.

2. Importing Required Libraries

● Import the required libraries for the project to the Colab environment.
● Import Pandas, NumPy, Seaborn, Matplotlib, Sklearn and Tensorflow libraries for data analysis.

3. Data Preprocessing

● In this section, prepare the data you have, for training the model.
● Create a dataframe that includes pixel values of images and the labels
● Use Label Encoding or One-Hot Encoding techniques to deal with categorical targets.
● Split your dataset into X_train,X_test, X_val, y_train, y_test and y_val
● Normalize the pixel values.

4. Building a Model

● Build a model using Tensorflow or Pytorch

- Your model should include Conv2D, MaxPooling2D, Flatten, Dense and Dropout.(Number of layers is up to you)
- Compile your model and print the summary of the model.
- Train your model using train and validation subsets
- Plot model's accuracy, validation accuracy, loss and validation loss.

Hint: Use "Softmax" as the activation function of the last Dense Layer.

5. Hyper-parameter Optimization

- Optimize the hyper-parameters of the model.
- Train your model with the opitimized parameters and show the results.

6. Project Delivery

- For the project delivery, you need to run all the cells that your .ipynb file has.
- You need to add these file that you have prepared to a GitHub repo and add the link of this repo to the form that is given down below.
- The project will be done as a team. The teams created should be a maximum of 5 people.
- You can send information about your project team via this form.
- Form Link: ##
- **Deadline: ##**