✹ Hello Future Infinity X Stars! ✹

Welcome to the exciting world of Infinity X! We are super thrilled to have you embark on this adventurous task. We hope you are ready for a journey filled with fun, learning, and, of course, a bit of challenge! 🚀 Let's see if you can be the Chandler to our Joey, the Monica to our Rachel! 🛋

🐾 Task: Paws and Whiskers Classifier 🐾

You are challenged to develop a two-layer classification model. Your model should be able to first determine whether an image is of a cat 🐱 or a dog 🐶. In the second layer, it should identify the breed or type of the animal.

Model Requirements:
- Utilize a Convolutional Neural Network (CNN) for image classification.
- Integrate k-Nearest Neighbors (KNN) for identifying the type of cat or dog.

📝 Detailed Steps:

🐕 1. Dog/Cat Classification:

a. **Dataset Preprocessing**: i. Load the dataset containing cat and dog images. ii. Preprocess the images: Resize, normalize, augment if necessary. iii. Split the dataset into training, validation, and test sets.

b. **Training**: i. Define and compile your CNN model. ii. Train the model using the training dataset. iii. Save the model after training.

c. **Testing**: i. Load the trained model. ii. Evaluate the model using the test dataset to predict whether the image is a cat or a dog.

d. **Evaluation**: i. Calculate the model's accuracy, precision, recall, and F1-score. ii. Analyze the model's performance and report any overfitting or underfitting observed.

e. **Execution**: i. Execute the model on some new/unseen images. ii. Save and present the results appropriately.

🐈 2. Type Classification:

a. **Dataset Preprocessing**: i. Organize the dataset based on the type (e.g. Husky, Golden, Tiger Cat, Egyptian Cat, etc.) ii. Preprocess the images similarly as done in step 1.

b. **Training**: i. Utilize k-NN to train the model for identifying the type of dog or cat. ii. Validate the model using the validation dataset.

c. **Testing**: i. Test the model using the test dataset to predict the type of cat or dog. ii. Document the results accurately.

d. **Evaluation**: i. Evaluate the model's performance using relevant metrics. ii. Summarize and interpret the results obtained.

e. **Execution**: i. Execute the model on new/unseen images to predict the type. ii. Compile and present the results in a comprehensible manner.

📞 **For Queries and Clarifications:**
Should you find any pivot points or feel lost in the vortex of confusion, don't hesitate to give a shout out to:

- **Bar:** 🔢 0539261211

🕐 **Submission Deadline:**
The deadline for this challenge is 3 days.

So, aspiring data scientists, could you BE more excited? Roll up your sleeves and let's see who can build the "smelly cat" of models…or maybe the "central perk" of models. 🐱 🌑 Good Luck! 🌈

Remember, it's not about winning, it's about learning, making friends, and having fun along the way! So, let's create some memorable moments together! Keep smiling and keep coding! ✳️