Project proposal

Title: Deep Learning for Flower Classification Using the Flowers102 Dataset

Course Name: Deep Learning with Pytorch

Instructor: Mohammed Yousefhussien

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Institution: Fanshawe College

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Project Description:
For my capstone project, I'll be working on an image classification model using deep learning to identify different types of flowers. I'll be using the **Flowers102** dataset, which contains images of 102 different flower species. The goal is to train a model that can accurately classify these flowers based on their images.

Why This Project?

Flower classification is useful in areas like botany and environmental science. Building a deep learning model for this task will help automate the process and improve my skills in **data preprocessing, model training, and evaluation**. Plus, working with images is always fun and gives me a chance to experiment with **visualizations** to better understand how the model works.

How Will I Do It?

1. **Prepare the dataset** – Resize, normalize, and split the images into training, validation, and test sets.
2. **Data Augmentation** – Apply transformations like flipping and rotating to make the model more robust.
3. **Model Selection** – Start with a CNN-based model (or a custom architecture).
4. **Training & Tuning** – Adjust learning rates, batch sizes, and optimizers to get the best results.
5. **Evaluation & Visualization** – Use accuracy, precision, recall, and F1-score to measure performance. I'll also visualize:
    - Confusion matrices
    - Sample predictions (both correct and incorrect)
    - Training loss and accuracy curves

What Data Will I Use?

I'll use the **Flowers102** dataset from Torchvision. Since it has 102 classes, I may use a **subset of 10-20 classes** to keep training manageable.

How Will I Evaluate It?

I'll test the model on unseen images and check its **accuracy, precision, recall, and F1-score**. I'll also look at misclassified images to understand where the model struggles. Visualizations will help me interpret the results and improve the model if needed.

This project will give me hands-on experience with deep learning and show how well a model can classify flowers just by looking at an image. Looking forward to seeing how it turns out!