🧬 Problem Statement: Skin Disease Classification using CNN

🔍 Objective:

To design and implement a **Convolutional Neural Network (CNN)** based deep learning model to classify images of skin conditions into one of the 20 predefined disease categories, aiming to assist dermatologists in faster, more accurate diagnosis.

📂 Dataset:

- **Name**: 20 Skin Diseases Dataset
- **Source**: Kaggle Dataset by Haroon Alam
- **Download Code**:

```
import kagglehub

# Download the latest version of the dataset
path = kagglehub.dataset_download("haroonalam16/20-skin-diseases-dataset")

print("Path to dataset files:", path)
```

🎯 Goals:

- Load and preprocess the image dataset (resizing, normalization, augmentation).
- Build and train a **CNN classifier** to predict the skin disease category.
- Evaluate the model using accuracy, precision, recall, F1-score, and confusion matrix.
- Integrate the model into a **Streamlit web app** for easy user interaction.
- Use **MLflow** for:

- Experiment tracking
- Model performance comparison
- Logging hyperparameters and metrics
- Model versioning and reproducibility

🧪 Expected Outcome:

An interactive AI tool that can classify an uploaded skin image into one of 20 disease categories with reliable accuracy, assisting in telemedicine and clinical workflows.

🛠️ Tools and Frameworks:

- **Deep Learning**: TensorFlow / Keras
- **UI**: Streamlit
- **Experiment Tracking & Versioning**: MLflow
- **Deployment**: Local or Docker-based Streamlit app
