Project Design Phase-I
Solution Architecture

Date: 08 November 2023	
Team ID: 591954	
Project Name: Weather Classification Using Deep Learning	
Maximum Marks: 5	

Building a solution architecture for weather classification using transfer learning involves multiple components and steps. Here is a high-level architecture to guide you through the process:

Data Collection:

Gather a diverse dataset of weather images, including various weather conditions like sunny, cloudy, rainy, snowy, etc.

Data Preprocessing:

Normalize the pixel values to bring them within a similar range. Augment the dataset by applying transformations like rotation, flipping, and zooming

Transfer Learning Model Selection:

Choose a pre-trained deep learning model that has been successful in image classification tasks, such as VGG, ResNet, Inception, or EfficientNet.

Feature Extraction:

Freeze the initial layers of the pre-trained model to prevent them from being retrained. Add new layers, including fully connected layers and a final softmax layer for the specific weather classification task.

Model Training:

Train the modified model using the preprocessed data. Fine-tune the hyperparameters, such as learning rate, batch size, and number of epochs, to achieve optimal performance.

Model Evaluation:

Evaluate the trained model on a separate validation dataset to assess its performance metrics, such as accuracy, precision, recall, and F1-score.

Model Deployment:

Save the trained model and integrate the model into a production environment, such as a web application or a mobile app, to enable real-time weather classification.
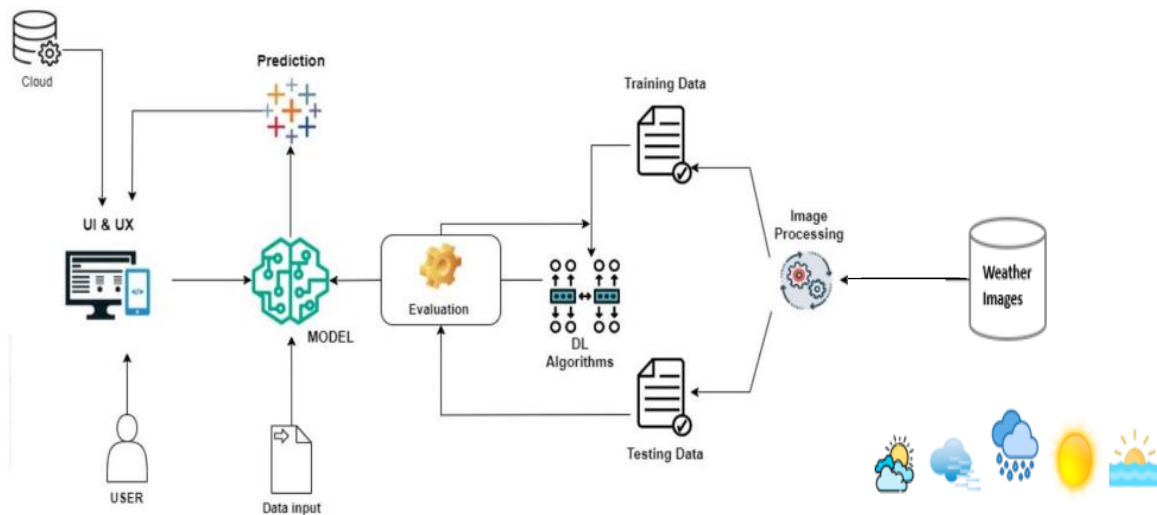
Solution Architecture Diagram:

Figure 1: Architecture of Weather Classification Using Deep Learning