Project Flow :

Web application:

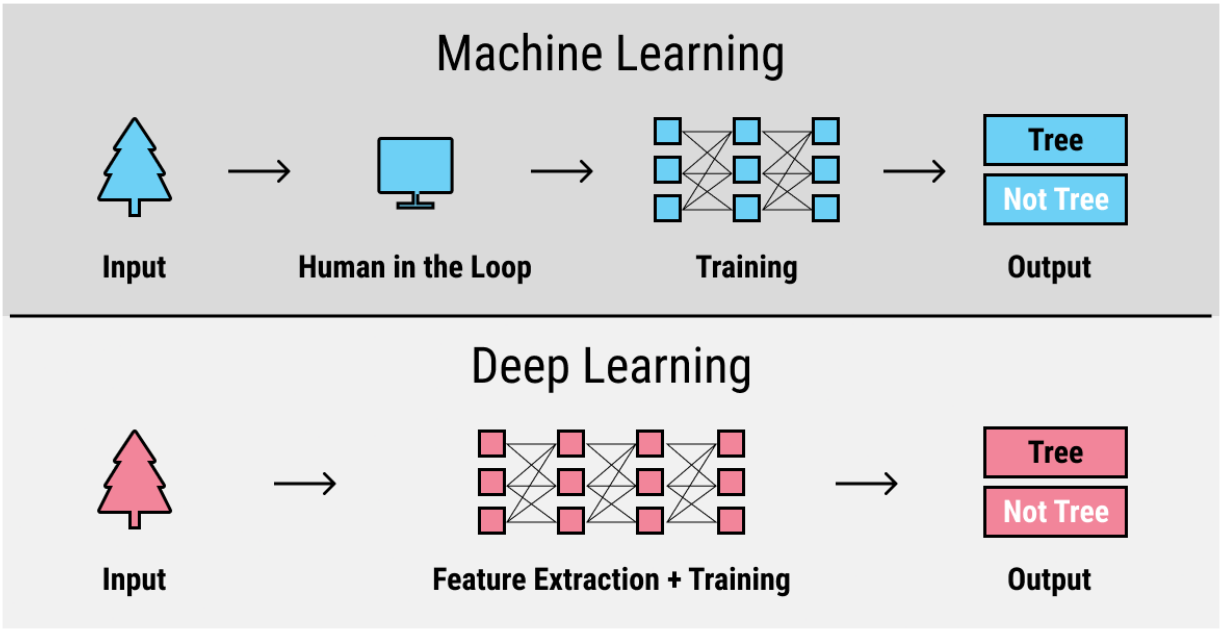
A Web application (Web app) is an application program that is stored on a remote server and delivered over the Internet through a browser interface.

Farmers can interact with the portal build with a single window access of Information and services in Agricultural Sector in India for farmers and other stakeholders Use of icons/pictures/ images and graphical interfaces to represent links and information for quicker understanding of the farmers. Alternate lighter Home page and alternate text display for icons/pictures/images for faster access depending upon connectivity speed. Consistent and Easy to Use interface-Consistent design of the web pages for common look and feel. Design in way so that the desired document can be traced in maximum 3 clicks. Interacts with the user interface to upload images of diseased leaf. Well designed home page conveying theme and purpose. Single Sign-on to access all information and services on the portal. Self service-Interface to user to set/reset his/her own password. Our model built analyses the Disease and suggests the farmer with fertilizers are to be used. The portal should allow the user to fulfill his needs, wherever possible, through self-service.

Dataset:

A dataset is a collection of data in which data is arranged in some order. A dataset can contain any data from a series of an array to a database table. During the development of the project, the developers completely rely on the datasets. The datasets are divided into two parts:

- **Training Set:** A subset of dataset to train the machine learning model, and we already know the output.
- **Test set:** A subset of dataset to test the machine learning model, and by using the test set, model predicts the output.

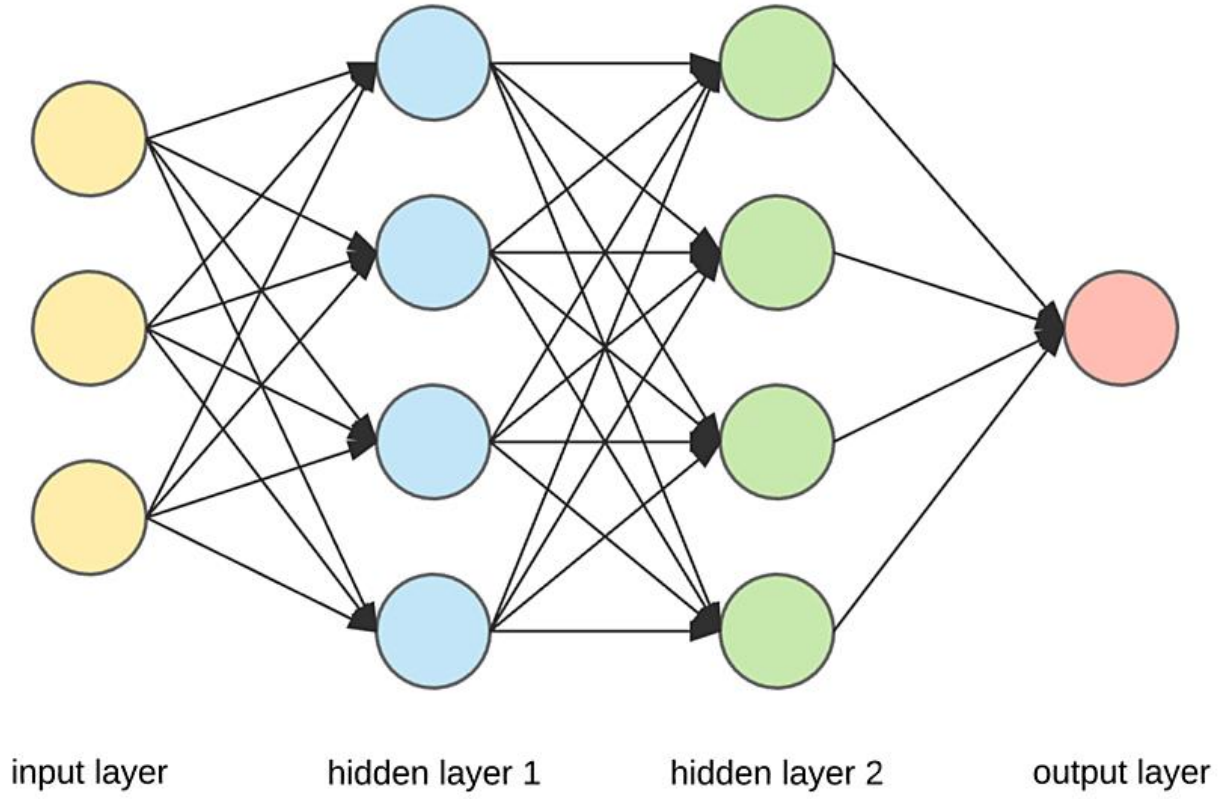


Some of the popular sites to download datasets are Kaggle Datasets, UCI Machine Learning Repository, Datasets via AWS and Google's Dataset Search Engine.

Neural network layers:

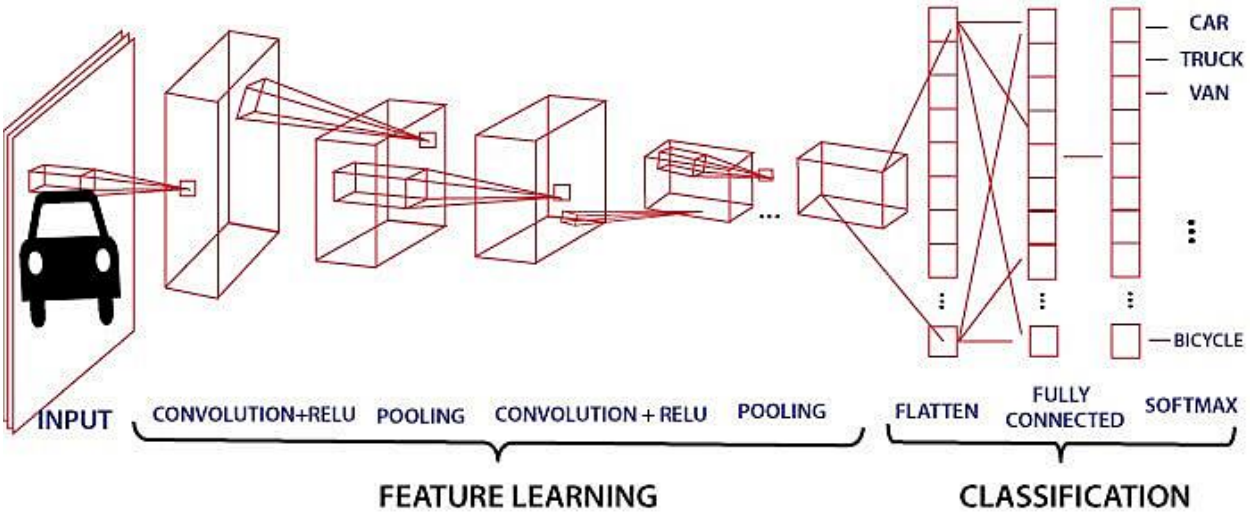
A neural network is made up of vertically stacked components called **Layers**. Each dotted line in the image represents a layer. There are three types of layers in a NN-

- **Input Layer**– First is the input layer. It will accept the data and pass it to the rest of the network.
- **Hidden Layer**– The second type of layer is called the hidden layer. Hidden layers are either one or more in number for a neural network.
- **Output layer**– The last type of layer is the output layer. The output layer holds the result or the output of the problem. Raw images get passed to the input layer and we receive output in the output layer.



Convolutional Neural Network:

It is one of the main categories to do image classification and image recognition in neural networks. Scene labeling, objects detections, and face recognition, etc., are some of the areas where convolutional neural networks are widely used. CNN takes an image as input, which is classified and process under a certain category such as dog, cat, lion, tiger, etc. The computer sees an image as an array of pixels and depends on the resolution of the image.



Load the trained images and fit the model:

Loading and transformation are two main concepts which are essential to do image recognition in Keras. Loading and transformation of the images is the starting step of the recognition process.

We used a deep neural network to classify the endless dataset, and we found that it will not classify our data best. When we used the deep neural network, the model accuracy was not sufficient, and the model could improve. This improvement will be made with the help of the convolutional neural network.

Training and Testing the images:

In the training section, we trained our CNN model on the dataset (Endless dataset), and it seemed to reach a reasonable loss and accuracy. If the model can take what it has learned and generalize itself to new data, then it would be a true testament to its performance. This will be done in the same way as we have done in our previous topic.

After validation, we test our model by grabbing an image from the web page.

Save the model and its dependencies:

Keras separates the concerns of saving your model architecture and saving your model weights. Model weights are saved to an HDF5 format. This grid format is ideal for storing multi-dimensional arrays of numbers. The model structure can be described and saved using two different formats: JSON and YAML.

Deploying using Flask:

Flask is a micro web framework written in Python. It is classified as a microframework because it does not require particular tools or libraries. It has no database abstraction layer, form validation, or any other components where pre-existing third-party libraries provide common functions. Flask is used for developing web applications using python, implemented on Werkzeug and Jinja2.

Advantages of using Flask framework are: There is a built-in development server and a fast debugger provided. This means flask provides you with tools, libraries and technologies that allow you to build a web application.

Task By

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