AI-Powered Nutrition Analyzer for Fitness Enthusiasts

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Prerequisites and Prior Knowledge:

- Artificial Intelligence
- Python
- HTML & CSS
- Natural Language Processing
- Cloudant DB

Project Flow:

- The user interacts with the UI (User Interface) and give the image as input.
- Then the input image is then pass to our flask application,
- And finally with the help of the model which we build we will classify the result and showcase it on the UI.

To accomplish this, we must complete all the activities and tasks listed below

- Data Collection.
  - Collect the dataset or create the dataset
- Data Pre-processing.
  - Import the ImageDataGenerator library
  - Configure ImageDataGenerator class
  - ApplyImageDataGenerator functionality to Trainset and Testset
- Model Building
  - Import the model building Libraries

    - Initializing the model
    - Adding Input Layer
    - Adding Hidden Layer
    - Adding Output Layer
    - Configure the Learning Process
    - Training and testing the model
    - Save the Model
- Application Building
    - Create an HTML file
    - Build Python Code

In order to develop this project, we need to install the following software/packages:

- Anaconda Navigator

Anaconda Navigator is a free and open-source distribution of the Python and R programming languages for data science and machine learning-related applications. It can be installed on Windows, Linux, and macOS. Conda is an open-source, cross-platform, package management system. Anaconda comes with great tools like JupyterLab, Jupyter Notebook, QtConsole, Spyder, Glueviz, Orange, Rstudio, Visual Studio Code.

- Flask - Web framework used for building Web applications.

If you are using anaconda navigator, follow the below steps to download the required packages:

Open anaconda prompt as administrator

If you are using Pycharm IDE, you can install the packages through the command prompt and follow the same syntax as above.

Web framework used for building Web applications

- Python packages:
    - open anaconda prompt as administrator
    - Type “pip install numpy” and click enter.
    - Type “pip install pandas” and click enter.
    - Type “pip install scikit-learn” and click enter.
    - Type “pip install tensorflow==2.3.0” and click enter.

- Type “pip install keras==2.4.0” and click enter.
- Type “pip install Flask” and click enter.

Deep Learning Concepts:

Artificial Neural Networks:

Artificial neural networks (ANNs), usually simply called neural networks (NNs) or neural nets are computing systems inspired by the biological neural networks that constitute animal brains.

An ANN is based on a collection of connected units or nodes called artificial neurons, which loosely model the neurons in a biological brain. Each connection, like the synapses in a biological brain, can transmit a signal to other neurons. An artificial neuron receives signals then processes them and can signal neurons connected to it.

Convolution Neural Networks:

A convolutional neural network (CNN or convnet) is a subset of machine learning. It is one of the various types of artificial neural networks which are used for different applications and data types. A CNN is a kind of network architecture for deep learning algorithms and is specifically used for image recognition and tasks that involve the processing of pixel data.