Test for Middle Python Developer (Machine Learning/AI)

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Task 1: MNIST Image Classification with TensorFlow

The purpose of this task is to design and implement a neural network using TensorFlow to classify images from the MNIST dataset. The MNIST dataset consists of 28x28 pixel grayscale images of handwritten digits (0 through 9). The goal is to build a model that accurately predicts the digit represented by each image.

Data Loading and Preprocessing:
The MNIST dataset is loaded(in Task-1.py) using TensorFlow's mnist.load_data() function. The dataset is then preprocessed by normalizing pixel values to the range [0, 1] and reshaping the images to (32, 32, 1) to suit the model input shape.

Design Neural Network Architecture:

The model architecture includes a flattening layer, a dense hidden layer with ReLU activation, and a dense output layer with softmax activation.

Designing 3 type neural network. There are:

1. CNN Model
2. DenseNet Model
3. VGG model

Model Evaluation
After training, the model is evaluated on the test dataset to assess its performance in terms of accuracy and loss.
Save Load the Model
Choosing best model, and the trained model can be saved to a file using the save method

Task 2: Working with databases

I used PostgreSQL database, creating a table, and writing a Python script to interact with the database. The Python script(in Task-2.py) is capable of performing basic operations such as adding, retrieving, updating, and deleting data.

Required Library:
pip install psycopg2-binary

Task 3: Google Sheets API

Description: A Python script that uses the Google Sheets API to retrieve data from a specific sheet.

Code Location: Task-3.py

Dependencies: google-auth, google-auth-oauthlib, google-auth-httplib2, google-api-python-client libraries.

Installation:
pip install google-auth google-auth-oauthlib google-auth-httplib2 google-api-python-client

_____Thank you_____