Assignment: Python Programming for DL

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Problem 1: Inventory Management System

Scenario:

An inventory management system helps track inventory levels, orders, sales, and deliveries. This scenario outlines the development and implementation of an inventory management system using Python .

Tasks:

1. Define Project Requirements, Objective: Outline the main functionalities and features of the system.
2. Design Database Schema
3. Objective: Create the database structure to store inventory, orders, and supplier information.
4. Set Up Development Environment
5. Objective: Prepare the development environment by installing necessary tools and libraries.

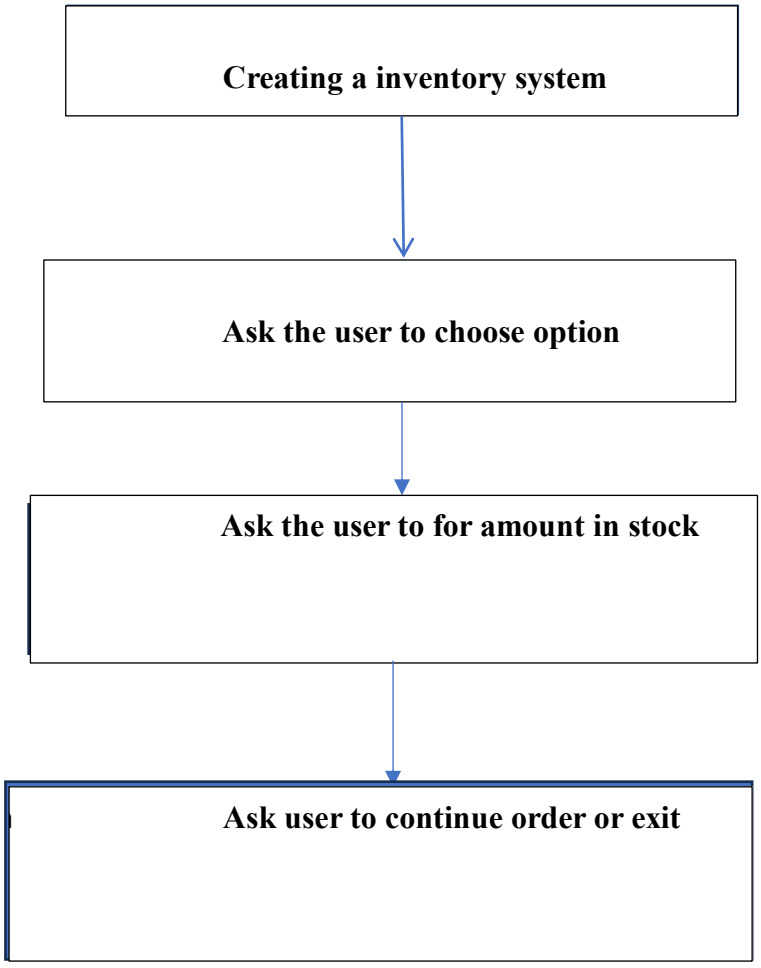
Deliverables:

- Data flow diagram illustrating the interaction between the application and the API.
- Pseudocode and implementation of the weather monitoring system.
- Documentation of the API integration and the methods used to fetch and display weather data.
- Explanation of any assumptions made and potential improvements.

Solution:

INVENTORY MANAGEMENT SYSTEM

1.Data Flow Diagram



```python
import pandas as pd
import json
import os.path
import time
import random

# Creating Dictionary to store data
available_products = {1001: {"name": "avocado", "price": 230,
                             "category": "grocery",
                             "quantity": 10, "date": "10/03/2021"},
                      1002: {"name": "lotion", "price": 250,
                             "category": "beauty & personal",
                             "quantity": 100,
                             "date": "15/07/2021"},
                      1003: {"name": "pain reliever", "price": 500,
                             "category": "health",
                             "quantity": 200, "date": "12/04/2021"},
                      1004: {"name": "dry pasta", "price": 20,
                             "category": "grocery",
                             "quantity": 50, "date": "27/06/2021"},
                      1005: {"name": "toothbrush", "price": 700,
                             "category": "beauty & personal",
                             "quantity": 100,
                             "date": "30/01/2021"},
                      1006: {"name": "halloween candy", "price": 33,
                             "category": "grocery",
                             "quantity": 56, "date": "22/02/2021"},
                      1007: {"name": "mascara", "price": 765,
                             "category": "beauty & personal",
                             "quantity": 70,
                             "date": "11/03/2021"},
                      1008: {"name": "capsicum", "price": 764,
                             "category": "grocery",
                             "quantity": 90, "date": "16/02/2021"},
                      1009: {"name": "blush", "price": 87,
                             "category": "beauty & personal",
                             "quantity": 50, "date": "17/07/2021"},
                      1010: {"name": "granola bars", "price": 24,
                             "category": "grocery", "quantity": 60,
                             "date": "20/05/2021"},
                      }

# Formatting Dictionary into JSON format
js = json.dumps(available_products)

#  json.dumps() function converts a
# Python object into a json string
js  # so we got all data in json string format here

# Create Json File for DataBase and Write data Into File
```

```
fd = open("data.json", 'w')
# it will open file into write mode if file
# does not exists then it will create file too'''
fd.write(js)  # writing string into file
fd.close()  # Close File After Inserting Data

def admin():
    print("========\
    Welcome to the Admin Inventory Management System \
    ==============")
    while (1):
        print("1)Display DataBase/All Products with there details")
        print("2)Display Specific Product with its details")
        print("3)Insert Data Into DataBase")
        print("4)Update Product in Database")
        print("5)Delete Product in DataBase")
        print("6)Display User Purchase Reports")
        print("7)Exit")
        print("Enter Your Choice :- ")
        n = int(input())
        if (n == 1):
            display_data()
        elif (n == 2):
            display_specific_data()
        elif (n == 3):
            add_new()
        elif (n == 4):
            update_prod_data()
        elif (n == 5):
            delete_prod()
        elif (n == 6):
            display_reports_admin()
        elif (n == 7):
            break
        else:
            print("Invalid Choice...!!!")


def display_data():

    fd = open("data.json", 'r')
    txt = fd.read()  # reading data from file
    data = json.loads(txt)

    # This will parse the JSON data, populates a
    # Python dictionary with the data
    fd.close()
    print("Enter '0' To Display Data Category Wise or '1' \
    To Show Data As its Sequence Of Insertion :- ")
    n = int(input())
```

```
    # Display All Records
    if (n == 1):
        table = pd.DataFrame(
            columns=['ID', 'name', 'price', 'category', 'quantity',
'date'])

        # Creating Pandas dataframe to show data in table format later
        for i in data.keys():

            # Fetch all keys in dictionary
            temp = pd.DataFrame(columns=['ID'])
            temp['ID'] = [i]
            for j in data[i].keys():
                temp[j] = [data[i][j]]
            table = table.append(temp)
        table = table.reset_index(drop=True)
        '''This will reset index of dataframe'''
        from IPython.display import display
        display(table)

    elif (n == 0):

        # Display Records by Category
        table = pd.DataFrame(
            columns=['ID', 'name', 'price', 'category',
                     'quantity', 'date'])
        cat = []

        for i in data.keys():
            temp = pd.DataFrame(columns=['ID'])
            temp['ID'] = [i]
            for j in data[i].keys():
                temp[j] = [data[i][j]]
                if (j == 'category'):
                    cat.append(data[i][j])
            table = table.append(temp)
            table = table.reset_index(drop=True)
            cat = set(cat)
            cat = list(cat)

        for k in cat:
            temp = pd.DataFrame()
            temp = table[table['category'] == k]
            print("Data Of Products Of Category "+k+" is:- ")
            from IPython.display import display
            display(temp)
    else:
        print("Enter Valid Choice...!!!")
```

```
# display_data() # Uncomment This Line To Run This Function
def display_specific_data():
    fd = open("data.json", 'r')
    txt = fd.read()
    data = json.loads(txt)
    fd.close()
    print("Enter Product ID Whose Details You Want to Have a Look
on :- ")
    i = input()

    # Following Code will Filter out Product ID from Records
    if i in data.keys():
        temp = pd.DataFrame(columns=['ID'])
        temp['ID'] = [i]
        for j in data[i].keys():
            temp[j] = [data[i][j]]
        from IPython.display import display
        display(temp)
    else:
        print("You Have Entered Wrong Product ID\
        that is not Present in DataBase...!!!")


# display_specific_data() # Uncomment This Line To Run This Function
def add_new():
    fd = open("data.json", 'r')
    txt = fd.read()
    data = json.loads(txt)
    fd.close()
    print("Enter New Product ID :- ")
    id = input()

    if id not in data.keys():
        print("Enter Product Name :- ")
        name = input()
        print("Enter Price of Product(price for product quantity as 1)
:- ")
        price = input()
        print("Enter Category of Product :- ")
        category = input()
        print("Enter Quantity of Product :- ")
        quantity = input()
        print("Enter The Date on Which Product is Added in
Inventory :- ")
        date = input()
        data[id] = {'name': name, 'price': price,
                    'category': category, 'quantity': quantity,
'date': date}
        print("Please Press '0' to Add New\
        Attributes/Properties of Product or Press '1' to Continue :-
```

```
")
        z = int(input())
        if(z == 0):
            print("Enter Number of New Attributes/Properties of
Product :- ")
            n = int(input())
            for i in range(n):
                print("Enter Attribute Name That you Want To Add :- ")
                nam = input()
                print("Enter The "+str(nam)+" of Product :- ")
                pro = input()
                data[id][nam] = pro
        print("Product ID "+str(id)+" Added Successfully...!!!")
    else:
        print("The Product ID you Have Entered Is\
        Already Present in DataBase Please Check...!!!")
    js = json.dumps(data)
    fd = open("data.json", 'w')
    fd.write(js)
    fd.close()

# add_new() # Uncomment This Line To Run This Function
def delete_prod():
    fd = open("data.json", 'r')
    txt = fd.read()
    data = json.loads(txt)
    fd.close()
    print("Enter The Product ID of The Product Which You Want To
Delete :- ")
    temp = input()
    if temp in data.keys():
        data.pop(temp)  # here we are removing that particular data
        print("Product ID "+str(temp)+" Deleted Successfully...!!!")
    else:
        print("Invalid Product ID...!!!")
    js = json.dumps(data)
    fd = open("data.json", 'w')
    fd.write(js)
    fd.close()

# delete_prod() # Uncomment This Line To Run This Function
def update_prod_data():
    fd = open("data.json", 'r')
    txt = fd.read()
    data = json.loads(txt)
    fd.close()
    print("Enter The Product ID of The Product\
    Which You Want To Update :- ")
    temp = input()
```

```
    if temp in data.keys():
        print("Want to update whole product data\
        press '0' else '1' for specific data :- ")
        q = int(input())

        if (q == 0):
            print("Enter Product Name :- ")
            name = input()
            print("Enter Price of Product(price for\
            product quantity as 1) :- ")
            price = input()
            print("Enter Category of Product :- ")
            category = input()
            print("Enter Quantity of Product :- ")
            quantity = input()
            print("Enter The Date on Which Product\
            is Added in Inventory :- ")
            date = input()
            data[temp] = {'name': name, 'price': price,
                          'category': category, 'quantity': quantity,
                          'date': date}
            print(
                "Please Press '0' to Add more Attributes/Properties of
Product or Press '1' to Continue :- ")
            z = int(input())

            if(z == 0):
                print("Enter Number of New Attributes/Properties of
Product :- ")
                n = int(input())
                for i in range(n):
                    print("Enter Attribute Name That you Want To
Add :- ")
                    nam = input()
                    print("Enter The "+str(nam)+" of Product :- ")
                    pro = input()
                    data[temp][nam] = pro
            print("Product ID "+str(temp)+" Updated
Successfully...!!!")

        elif(q == 1):
            print("Enter Which Attribute of Product You want to Update
:- ")
            p = input()

            if p in data[temp].keys():
                print("Enter "+str(p)+" of Product :- ")
                u = input()
                data[temp][p] = u
                print("Product ID "+str(temp)+"'s attribute " +
```

```
        for i in user_data.keys():
            temp = pd.DataFrame()
            for j in user_data[i].keys():
                d = dict()
                d['User ID'] = i
                d['Purchase Number'] = j
                for k in user_data[i][j].keys():
                    d[k] = user_data[i][j][k]
                temp = temp.append(d, ignore_index=True)
                d = dict()
            table = table.append(temp)
        table = table.reset_index(drop=True)
        from IPython.display import display
        display(table)
    else:
        print("Please Enter Valid Choice...!!!")

# display_reports_admin() # Uncomment This Line To Run This Function
def delete_all():
    fd = open("data.json", 'r')
    txt = fd.read()
    data = json.loads(txt)
    fd.close()
    data = {}  # Replacing Data with NULL Dictionary
    js = json.dumps(data)
    fd = open("data.json", 'w')
    fd.write(js)
    fd.close()


def user():
    print("======= Welcome to the User Inventory Management System
====")
    while (1):
        print("1)Display All Products With Details")
        print("2)Display Specific Product With Details")
        print("3)Display All Purchase Bills")
        print("4)Buy The Product")
        print("5)Exit")
        print("Enter Your Choice :- ")
        n = int(input())
        if (n == 1):
            display_data()
        elif (n == 2):
            display_specific_data()
        elif (n == 3):
            display_user_data()
        elif (n == 4):
            buy_product()
        elif (n == 5):
```

```
            break
        else:
            print("Invalid Choice...!!!")


def display_user_data():

    if (os.path.isfile("user_data.json") is False):
        print("No User Reports are Present")
        return
    fd = open("user_data.json", 'r')
    txt = fd.read()
    user_data = json.loads(txt)
    fd.close()
    print("Enter your User ID to Display All your Bills :- ")
    i = input()
    temp = pd.DataFrame()

    if i in user_data.keys():
        for j in user_data[i].keys():
            d = dict()
            d['User ID'] = i
            d['Purchase Number'] = j
            for k in user_data[i][j].keys():
                d[k] = user_data[i][j][k]
            temp = temp.append(d, ignore_index=True)
            d = dict()
        temp = temp.reset_index(drop=True)
        from IPython.display import display
        display(temp)
    else:
        print("You Have Entered Wrong User ID that is not Present in
DataBase...!!!")


def generate_bill(user_id, prod_id, price, time_date, purchase_no,
                  name, category, quantity_all, transaction_id):
    print("========= Bill ========")
    print("########################")
    print("   User ID :-", user_id)
    print("##################")
    amount = 0
    n = len(purchase_no)

    for i in range(n):
        print("----------------------------------------")
        amount = amount+float(price[i])*float(quantity_all[i])
        print("Purchase number", purchase_no[i],
              "\nPurchase Time :-", time_date[i], "\nProduct ID :-",
              prod_id[i], "\nName Of Product :-",
```

```
                name[i], "\nCategory Of Product :-", category[i],
                "\nPrice of Product per Item :-", price[i],
                "\nPurchase Quantity :-", quantity_all[i])
            print("-----------------------------------")
        print("*****************************************")
        print("   Total Payable Bill :-",
              amount, "Transaction ID :-", transaction_id)
        print("*****************************************")


def buy_product():

    if (os.path.isfile("user_data.json") is False):
        user_data = {}
    else:
        fd = open("user_data.json", 'r')
        txt = fd.read()
        user_data = json.loads(txt)
        fd.close()
    fd = open("data.json", 'r')
    txt = fd.read()
    data = json.loads(txt)
    fd.close()
    print("Enter Your User ID if You are Old \
    Customer else press '0' To New User ID :- ")
    p = int(input())
    if (p == 0):
        if (len(user_data.keys()) == 0):
            user_id = 1000
        else:
            user_id = int(list(user_data.keys())[-1])+1
    else:
        if str(p) in user_data.keys():
            user_id = p
        else:
            user_id = -1
    if (user_id != -1):
        user_id = str(user_id)
        price = []
        time_date = []
        purchase_no = []
        name = []
        category = []
        quantity_all = []
        prod_id = []
        transaction_id = ''.join(random.choice(
            '0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ') for i in
range(10))
        print("Enter Number of Products You Want To Buy :- ")
        n = int(input())
```

```
        print("Enter Data As Follows :- ")
        if user_id not in user_data.keys():
            user_data[user_id] = {}
            g = 0
        else:
            g = int(list(user_data[user_id].keys())[-1])+1
        for i in range(n):
            print("Enter Product ID of Product " +
                  str(i+1)+" that you want to buy")
            id = input()
            if id in data.keys():
                user_data[user_id][str(i+1+g)] = {}
                user_data[user_id][str(i+1+g)]['time_date'] =
str(time.ctime())
                time_date.append(str(time.ctime()))
                if(float(data[id]['quantity']) == 0.0):
                    print("Product You Want is Currently Out Of
Stock...!!!")
                    continue
                purchase_no.append(i+1+g)
                name.append(data[id]['name'])
                user_data[user_id][str(i+1+g)]['name'] = data[id]
['name']
                prod_id.append(id)
                user_data[user_id][str(i+1+g)]['product_id'] = id
                category.append(data[id]['category'])
                user_data[user_id][str(
                    i+1+g)]['category'] = data[id]['category']
                print("For Product "+str(data[id]['name']) +
                      " Available Quantity is :- "+str(data[id]
['quantity']))
                print("Enter Quantity of Product " +
                      str(i+1)+" that you want to buy")
                quantity = input()
                if (float(quantity) <= float(data[id]['quantity'])):
                    data[id]['quantity'] = str(
                        float(data[id]['quantity'])-float(quantity))
                    quantity_all.append(quantity)
                    user_data[user_id][str(i+1+g)]['quantity'] =
str(quantity)
                    price.append(data[id]['price'])
                    user_data[user_id][str(i+1+g)]['price'] = data[id]
['price']
                    user_data[user_id][str(
                        i+1+g)]['Transaction ID'] =
str(transaction_id)
                else:
                    print(
                        "The Quantity You Have Asked is Quite High
Than\
```

```
                        That is Available in Stock")
                    print(
                        "Did you Want To buy According to The
Quantity\
                        Available in Stock then Enter '0' Else '1'\
                        to skip This Product")
                    key = int(input())
                    if (key == 0):
                        print("Enter Quantity of Product " +
                              str(i+1)+" that you want to buy")
                        quantity = intput()
                        if (float(quantity) <= float(data[id]
['quantity'])):
                            data[id]['quantity'] = str(
                                float(data[id]['quantity'])-
float(quantity))
                            quantity_all.append(quantity)
                            user_data[user_id][str(
                                i+1)]['quantity'] = str(quantity)
                            price.append(data[id]['price'])
                            user_data[user_id][str(
                                i+1)]['price'] = data[id]['price']
                            user_data[user_id][str(
                                i+1+g)]['Transaction ID'] =
str(transaction_id)
                        else:
                            print("Invalid Operation Got
Repeated...!!!")
                    elif (key == 1):
                        continue
                    else:
                        print("Invalid Choice...!!!")
                else:
                    print("Invalid Product ID...!!!")
            if(len(purchase_no) != 0):
                generate_bill(user_id, prod_id, price, time_date,
purchase_no,
                              name, category, quantity_all,
transaction_id)
        else:
            print("User ID Doesn't Exists...!!!")
        js = json.dumps(data)
        fd = open("data.json", 'w')
        fd.write(js)
        fd.close()
        js = json.dumps(user_data)
        fd = open("user_data.json", 'w')
        fd.write(js)
        fd.close()
```

```
while (1):
    print("Choose Any One of The Following :- ")
    print("1)Admin")
    print("2)User")
    print("3)Exit")
    print("Enter Your Choice Here :- ")
    n = int(input())
    if (n == 1):
        admin()
    elif (n == 2):
        user()
    elif (n == 3):
        break
    else:
        print("Invalid Choice...!!!")
```

3.Display the Inventory details

Choose Any One of The Following :-
1)Admin
2)User
3)Exit
Enter Your Choice Here

4.UseInput

```
Enter Your Choice Here :-
2
======= Welcome to the User Inventory Management System ====
1)Display All Products With Details
2)Display Specific Product With Details
3)Display All Purchase Bills
4)Buy The Product
5)Exit
Enter Your Choice :-
4
Enter Your User ID if You are Old     Customer else press '0' To New User ID :-
1005
User ID Doesn't Exists...!!!
1)Display All Products With Details
2)Display Specific Product With Details
3)Display All Purchase Bills
4)Buy The Product
5)Exit
Enter Your Choice :-
2
Enter Product ID Whose Details You Want to Have a Look on :-
1005
```

	ID	name	price	category	quantity	date
0	1005	toothbrush	700	beauty & personal	100	30/01/2021

```
1)Display All Products With Details
2)Display Specific Product With Details
3)Display All Purchase Bills
4)Buy The Product
5)Exit
Enter Your Choice :-
5
```

5.Documentation

Inventory Management System Documentation

Table of Contents

Introduction

- The Inventory Management System is designed to help businesses manage their inventory effectively. It allows users to track inventory levels, manage stock, and generate reports.

Features

- *Add, update, and delete inventory items*
- *Track inventory levels*
- *Generate inventory reports*
- *User authentication*
- *Search functionality*

Installation

- **Clone the repository.**
- **Create a virtual environment and activate it.**
- **Install the required dependencies.**
- **Set up the database.**
- **Run the application**

Usage

- **Starting the Application:** After running **python app.py**, the application will start, and you can access it through your web browser at **http://localhost:5000**.
- **User Authentication:**
  - Register a new user or log in with existing credentials.
  - Only authenticated users can manage the inventory.
- **Managing Inventory:**
  - **Add Item:** Navigate to the "Add Item" page to add new inventory items.
  - **Update Item:** Edit item details from the inventory list.
  - **Delete Item:** Remove items from the inventory.
  - **View Inventory:** View all inventory items, including their details and current stock levels.
- **Generating Reports:**
  - Navigate to the "Reports" section to generate and view inventory reports.

Conclusion

- This Inventory Management System provides a simple yet effective way to manage and track inventory. It can be extended with additional features like advanced reporting, barcode scanning, and integration with other business systems.