MAJOR PROJECT 2 LMS - Sanjay Anand V

Library Management System

1)Importing Libraries

In [1]:

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

2)Creating Dictionaries,Dataframes and JSON files

In [2]:

```
books={
  "1": {"book_name": "The Alchemist","book_id": "B001","quantity": 10,"genre": "Fiction"
  "2": {"book_name": "The Hitchhiker's Guide to the Galaxy","book_id": "B002","quantity"
  "3": {"book_name": "The Lord of the Rings","book_id": "B003","quantity": 8,"genre": "F
  "4": {"book_name": "The Girl with the Dragon Tattoo","book_id": "B004","quantity": 3,"
  "5": {"book_name": "1984","book_id": "B005","quantity": 12,"genre": "Dystopian Fiction
  "6": {"book_name": "The Da Vinci Code","book_id": "B006","quantity": 7,"genre": "Myste
  "7": {"book_name": "The Hunger Games","book_id": "B007","quantity": 9,"genre": "Young
  "8": {"book_name": "The Catcher in the Rye","book_id": "B008","quantity": 4,"genre": "
  "9": {"book_name": "Gone Girl","book_id": "B009","quantity": 6,"genre": "Thriller","pr
  "10":{"book_name": "Harry Potter and the Philosopher's Stone","book_id": "B010","quant
}
```

In [3]:

```
b=pd.DataFrame.from_dict(books)
b
df=b
```

In [4]:

```
students={
    "1":{"student_name":"Sanjay","student_id":"101","grad_year":"2024","grad_degree":"BE
    "2":{"student_name":"Anand","student_id":"102","grad_year":"2025","grad_degree":"BE
    "3":{"student_name":"Nandhini","student_id":"103","grad_year":"2024","grad_degree":"
    "4":{"student_name":"Nandy","student_id":"104","grad_year":"2023","grad_degree":"BE
    "5":{"student_name":"Vijay","student_id":"105","grad_year":"2025","grad_degree":"BE
    "6":{"student_name":"Lokesh","student_id":"106","grad_year":"2024","grad_degree":"BE
    "7":{"student_name":"Akshaya","student_id":"107","grad_year":"2026","grad_degree":"B
    "8":{"student_name":"Achintya","student_id":"108","grad_year":"2025","grad_degree":"
    "9":{"student_name":"Kumar","student_id":"109","grad_year":"2024","grad_degree":"BE
    "10":{"student_name":"Ashish","student_id":"110","grad_year":"2023","grad_degree":"B

}
```

In [5]:

```
s=pd.DataFrame.from_dict(students)
s
df1=s
```

In [6]:

```
df
```

Out[6]:

	1	2	3	4	5	6	7	8
book_name	The Alchemist	The Hitchhiker's Guide to the Galaxy	The Lord of the Rings	The Girl with the Dragon Tattoo	1984	The Da Vinci Code	The Hunger Games	The Catcher in the Rye
book_id	B001	B002	B003	B004	B005	B006	B007	B008
quantity	10	5	8	3	12	7	9	4
genre	Fiction	Science Fiction	Fantasy	Thriller	Dystopian Fiction	Mystery	Young Adult, Dystopian Fiction	Fiction
price	Rs.599	Rs.499	Rs.399	Rs.559	Rs.699	Rs.459	Rs.659	Rs.759
author	Paulo Coelho	Douglas Adams	J.R.R. Tolkien	Stieg Larsson	George Orwell	Dan Brown	Suzanne Collins	J.D. Salinger

In [7]:

```
df1
```

Out[7]:

	1	2	3	4	5	6	
student_name	Sanjay	Anand	Nandhini	Nandy	Vijay	Lokesh	Aksha
student_id	101	102	103	104	105	106	1
grad_year	2024	2025	2024	2023	2025	2024	20
grad_degree	BE Mechanical	BE IT	BE CS	BE AIDS	BE AIML	BE ECE	BE E
book_issued	01/04/2023	20/03/2023	30/03/2023	05/04/2023	15/03/2023	02/04/2023	26/03/20
book_return	20/04/2023	10/04/2023	20/04/2023	25/04/2023	05/04/2023	22/04/2023	16/04/20

In [8]:

```
lms=df.to_json('lms.json')
std=df1.to_json('std.json')
```

3)Creating Admin Level Functionality

In [9]:

```
def admin():
    print("============== Welcome to the Admin Library Management System =====")

    while (1):
        print("1)Display All Books with there details")
        print("2)Display Specific Book with its details")
        print("3)Insert Book details Into DataBase")
        print("4)Update Book details in Database")
        print("5)Delete Book Details in DataBase")
        print("6)Display All Students with there details")
        print("7)Display Specific Student with its details")
        print("8)Insert Student details Into DataBase")
        print("9)Delete Student Details in DataBase")
        print("10)Exit")
        print("Enter Your Choice :- ")

        n = int(input())
        if (n == 1):
            display_book()
        elif (n == 2):
            display_specific_book()
        elif (n == 3):
            add_book()
        elif (n == 4):
            update_book()
        elif (n == 5):
            delete_book()
        if (n == 6):
            display_student()
        elif (n == 7):
            display_specific_student()
        elif (n == 8):
            add_student()
        elif (n == 9):
            delete_student()
        elif (n == 10):
            break
        else:
            print("Invalid Choice...!!!")
```

a)Function to display all book details

In [10]:

```
def display_book():
    import pandas as pd
    import json
    fd = open("lms.json", 'r')
    txt = fd.read()
    lms = json.loads(txt)


    fd.close()
    print("Enter '0' To Display Book Category Wise or '1' \
    To Show Data As its Sequence Of Insertion :- ")
    n = int(input())


    if (n == 1):
        table = pd.DataFrame(
            columns=['book_name', 'book_id', 'quantity', 'genre',
                     'price', 'author'])


        for i in lms.keys():
            '''Fetch all keys in dictionary'''
            temp = pd.DataFrame(columns=['BOOK_NO'])
            temp['BOOK_NO'] = [i]

            for j in lms[i].keys():
                temp[j] = [lms[i][j]]
            table = pd.concat([table,temp],ignore_index=True)


        from IPython.display import display
        display(table)
    elif (n == 0):


        table = pd.DataFrame(
            columns=['book_name', 'book_id', 'quantity', 'genre',
                     'price', 'author'])
        cat = []

        for i in lms.keys():
            temp = pd.DataFrame(columns=['BOOK_NO'])
            temp['BOOK_NO'] = [i]
            for j in lms[i].keys():
                temp[j] = [lms[i][j]]
                if (j == 'genre'):
                    cat.append(lms[i][j])
            table = pd.concat([table,temp],ignore_index=True)
            cat = set(cat)
            cat = list(cat)

        for k in cat:
            temp = pd.DataFrame()
            temp = table[table['genre'] == k]
            print("Data Of books Of genre "+k+" is:- ")
            from IPython.display import display
            display(temp)
    else:
```

```
        print("Enter Valid Choice...!!!")
```

b)Function to display specific book details

In [11]:

```
def display_specific_book():
    import pandas as pd
    import json
    fd = open("lms.json", 'r')
    txt = fd.read()
    lms = json.loads(txt)
    fd.close()
    print("Enter Book ID Whose Details You Want to Have a Look on :- ")
    i = input()


    if i in lms.keys():
        temp = pd.DataFrame(columns=['BOOK_NO'])
        temp['BOOK_NO'] = [i]

        for j in lms[i].keys():
            temp[j] = [lms[i][j]]

        from IPython.display import display
        display(temp)
    else:
        print("You Have Entered Wrong Book ID \
        that is not Present in DataBase...!!!")
```

c)Function to add book details

In [12]:

```
def add_book():
    import json
    fd = open("lms.json", 'r')
    txt = fd.read()
    lms = json.loads(txt)
    fd.close()
    print("Enter New book ID :- ")
    id = input()

    if id not in lms.keys():
        print("Enter book Name :- ")
        book_name = input()
        print("Enter id of book :- ")
        book_id = input()
        print("Enter Quantity of book :- ")
        quantity = input()
        print("Enter genre of book :- ")
        genre = input()
        print("Enter Price of book(price for product quantity as 1) :- ")
        price = input()
        print("Enter The Author of the book :- ")
        author = input()

        lms[id] = {'book_name': book_name, 'book_id': book_id,
                   'quantity': quantity, 'genre': genre, 'price': price,'author':author
        print("Please Press '0' to Add New Attributes\
        /Properties of Book or Press '1' to Continue :- ")
        z = int(input())

        if(z == 0):
            print("Enter Number of New Attributes/Properties of Book :- ")
            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("Book ID "+str(id)+" Added Successfully...!!!")

    else:
        print("The Book ID you Have Entered Is Already Present\
        t in DataBase Please Check...!!!")
    js = json.dumps(lms)
    fd = open("lms.json", 'w')
    fd.write(js)
    fd.close()
```

d)Function to delete book details

In [13]:

```
def delete_book():
    import json
    fd = open("lms.json", 'r')
    txt = fd.read()
    lms = json.loads(txt)
    fd.close()
    print("Enter The Book ID of The Book Which You Want To Delete :- ")
    temp = input()

    if temp in lms.keys():


        lms.pop(temp)
        print(" Book ID "+str(temp)+" Deleted Successfully...!!!")
    else:
        print("Invalid Book ID...!!!")
    js = json.dumps(lms)
    fd = open("lms.json", 'w')
    fd.write(js)
    fd.close()
```

e)Function to update book details

In [14]:

```
def update_book():
    import json
    fd = open("lms.json", 'r')
    txt = fd.read()
    lms = json.loads(txt)
    fd.close()
    print("Enter The Book ID of The Book\
    Which You Want To Update :- ")
    temp = input()

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

            print("Enter book Name :- ")
            book_name = input()
            print("Enter Quantity of book :- ")
            quantity = input()
            print("Enter genre of book :- ")
            genre = input()
            print("Enter Price of book(price for product quantity as 1) :- ")
            price = input()
            print("Enter The Author of the book :- ")
            author = input()

            lms[temp] = {'book_name': book_name, 'book_id': book_id,
                    'quantity': quantity, 'genre': genre, 'price': price,'author':author
            print(
                "Please Press '0' to Add more Attributes\
                /Properties of Book or Press '1' to Continue :- ")
            z = int(input())
            if(z == 0):
                print("Enter Number of New Attributes/Properties of Book :- ")
                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 Book :- ")
                    pro = input()
                    lms[temp][nam] = pro
            print("Book ID "+str(temp)+" Updated Successfully...!!!")

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

            if p in lms[temp].keys():
                print("Enter "+str(p)+" of Book :- ")
                u = input()
                lms[temp][p] = u
                print("Book ID "+str(temp)+"'s attribute " +
                    str(p)+" is Updated Successfully...!!!")
            else:
                print("Invalid Book Attribute...!!!")
        else:
            print("Invalid Choice...!!!")
```

```
    else:
        print("Invalid Book ID...!!!")
    js = json.dumps(lms)
    fd = open("lms.json", 'w')
    fd.write(js)
    fd.close()
```

f)Function to delete whole LMS

In [15]:

```
def delete_all():
    fd = open("lms.json", 'r')
    txt = fd.read()
    lms = json.loads(txt)
    fd.close()
    lms = {}
    js = json.dumps(lms)
    fd = open("lms.json", 'w')
    fd.write(js)
    fd.close()
```

g)Function to display all student details

In [16]:

```
def display_student():
    import pandas as pd
    import json
    fd = open("std.json", 'r')
    txt = fd.read()
    std = json.loads(txt)


    fd.close()
    print("Enter '0' To exit or '1' \
    To Show Data As its Sequence Of Insertion :- ")
    n = int(input())


    if (n == 1):
        table = pd.DataFrame(
            columns=['student_name', 'student_id', 'grad_year', 'grad_degree'])

        for i in std.keys():
            '''Fetch all keys in dictionary'''
            temp = pd.DataFrame(columns=['Student_No'])
            temp['Student_No'] = [i]

            for j in std[i].keys():
                temp[j] = [std[i][j]]
            table = pd.concat([table,temp],ignore_index=True)


        from IPython.display import display
        display(table)

    else:
        print("Enter Valid Choice...!!!")
```

h)Function to display Specific student details

In [17]:

```
def display_specific_student():
    import pandas as pd
    import json
    fd = open("std.json", 'r')
    txt = fd.read()
    std = json.loads(txt)
    fd.close()
    print("Enter Student ID Whose Details You Want to Have a Look on :- ")
    i = input()


    if i in std.keys():
        temp = pd.DataFrame(columns=['Student_No'])
        temp['Student_No'] = [i]

        for j in std[i].keys():
            temp[j] = [std[i][j]]

        from IPython.display import display
        display(temp)
    else:
        print("You Have Entered Wrong Student ID \
        that is not Present in DataBase...!!!")
```

i)Function to add student details

In [18]:

```
def add_student():
    import json
    fd = open("std.json", 'r')
    txt = fd.read()
    std = json.loads(txt)
    fd.close()
    print("Enter New student ID :- ")
    id = input()

    if id not in std.keys():
        print("Enter student Name :- ")
        student_name = input()
        print("Enter id of student :- ")
        student_id = input()
        print("Enter graduation year of student :- ")
        grad_year = input()
        print("Enter graduation degree of student :- ")
        grad_degree = input()

        std[id] = {'student_name': student_name, 'student_id': student_id,
                   'grad_year': grad_year, 'grad_degree': grad_degree}
        print("Please Press '0' to Add New Attributes\
        /Properties of student or Press '1' to Continue :- ")
        z = int(input())

        if(z == 0):
            print("Enter Number of New Attributes/Properties of student :- ")
            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 student :- ")
                pro = input()
                std[id][nam] = pro
        print("Student ID "+str(id)+" Added Successfully...!!!")

    else:
        print("The Student ID you Have Entered Is Already Present\
        t in DataBase Please Check...!!!")
    js = json.dumps(std)
    fd = open("std.json", 'w')
    fd.write(js)
    fd.close()
```

j)Function to delete student details

In [19]:

```
def delete_student():
    import json
    fd = open("std.json", 'r')
    txt = fd.read()
    std = json.loads(txt)
    fd.close()
    print("Enter The Student ID of The Student Which You Want To Delete :- ")
    temp = input()

    if temp in std.keys():


        std.pop(temp)
        print(" Book ID "+str(temp)+" Deleted Successfully...!!!")
    else:
        print("Invalid Book ID...!!!")
    js = json.dumps(std)
    fd = open("lms.json", 'w')
    fd.write(js)
    fd.close()
```

4)Creating User Level functionality

In [20]:

```
def user():
    print("===============\
    Welcome to the User Library Management System\
    ============================================")

    while (1):
        print("1)Display All Books With Details")
        print("2)Display Specific Book With Details")
        print("3)Display All Purchase Bills")
        print("4)Exit")
        print("Enter Your Choice :- ")
        n = int(input())
        if (n == 1):
            display_book()
        elif (n == 2):
            display_specific_book()
        elif (n == 3):
            generate_bill()
        elif (n == 4):
            break
        else:
            print("Invalid Choice...!!!")
```

a)Function to generate bill

In [21]:

```
def generate_bill():
    print("Enter student id:")
    student_id=input()
    print("Enter the number of books:")
    n=int(input())
    print("================================\
================ Bill ================\
================================")
    print("########################################")
    print(" Student ID :-", student_id)
    print("########################################")
    amount = 0
    for i in range(n):
        print("Enter book id:")
        book_id=input()
        print("Enter book name:")
        book_name=input()
        print("Enter no of this books:")
        quantity=input()
        print("Enter the price of the book:")
        price=input()
        transaction_id = ''.join(random.choice('0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ'))
        print("---------------------------------------")
        amount = amount+float(price)*float(quantity)
        print("Purchase number", i,
            "\nBook ID :-",book_id ,
            "\nName Of book :-",book_name,
            "\nPrice of Product per Item :-", price,
            "\nPurchase Quantity :-", quantity)
        print("-------------------------------------------------")
    print("*************************************************")
    print("  Total Payable Bill :-Rs.",
        amount, "Transaction ID :-",transaction_id)
    print("*********************************")
```

5)User Interface

In [22]:

```
import json
import pandas as pd

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...!!!")
```

```
Enter Your Choice :-
5
Enter The Book ID of The Book Which You Want To Delete :-
11
 Book ID 11 Deleted Successfully...!!!
Invalid Choice...!!!
1)Display All Books with there details
2)Display Specific Book with its details
3)Insert Book details Into DataBase
4)Update Book details in Database
5)Delete Book Details in DataBase
6)Display All Students with there details
7)Display Specific Student with its details
8)Insert Student details Into DataBase
9)Delete Student Details in DataBase
10)Exit
Enter Your Choice :-
6
Enter '0' To exit or '1'        To Show Data As its Sequence Of Inserti
on :-
```

In [ ]: