**Code snippets:**

package corejavaassigbnment;

import java.io.Serializable;

import java.time.LocalDate;

public class Book implements Serializable{

long bookId;

String title;

double price;

Integer volume;

LocalDate publishDate;

@Override

public String toString() {

return "Book [bookId=" + bookId + ", title=" + title + ", price="

+ price + ", volume=" + volume + ", publishDate=" + publishDate

+ "]";

}

public Book(long bookId, String title, double price, Integer volume,

LocalDate publishDate) {

super();

this.bookId = bookId;

this.title = title;

this.price = price;

this.volume = volume;

this.publishDate = publishDate;

}

public Book(){

}

public long getBookId() {

return bookId;

}

public void setBookId(long bookId) {

this.bookId = bookId;

}

public String getTitle() {

return title;

}

public void setTitle(String title) {

this.title = title;

}

public double getPrice() {

return price;

}

public void setPrice(double price) {

this.price = price;

}

public Integer getVolume() {

return volume;

}

public void setVolume(Integer volume) {

this.volume = volume;

}

public LocalDate getPublishDate() {

return publishDate;

}

public void setPublishDate(LocalDate publishDate) {

this.publishDate = publishDate;

}

}

**package** corejavaassigbnment;

**import** java.io.Serializable;

**import** java.util.HashSet;

**import** java.util.Set;

**public** **class** **Subject** **implements** Serializable {

**long** subjectId;

String subtitle;

**int** durationInHours;

Set<Book> references=**new** HashSet<Book>();

**public** **long** getSubjectId() {

**return** subjectId;

}

**public** **void** setSubjectId(**long** subjectId) {

**this**.subjectId = subjectId;

}

**public** String getSubtitle() {

**return** subtitle;

}

**public** **void** setSubtitle(String subtitle) {

**this**.subtitle = subtitle;

}

**public** **int** getDurationInHours() {

**return** durationInHours;

}

**public** **void** setDurationInHours(**int** durationInHours) {

**this**.durationInHours = durationInHours;

}

**public** Set<Book> getReferences() {

**return** references;

}

**public** **void** setReferences(Set<Book> references) {

**this**.references = references;

}

**public** Subject(**long** subjectId, String subtitle, **int** durationInHours,

Set<Book> references) {

**super**();

**this**.subjectId = subjectId;

**this**.subtitle = subtitle;

**this**.durationInHours = durationInHours;

**this**.references = references;

}

@Override

**public** String toString() {

**return** "Subject [subjectId=" + subjectId + ", subtitle=" + subtitle

+ ", durationInHours=" + durationInHours + ", references="

+ references + "]";

}

}

package corejavaassigbnment;

import java.io.FileInputStream;

import java.io.FileNotFoundException;

import java.io.FileOutputStream;

import java.io.IOException;

import java.io.InputStream;

import java.io.ObjectInputStream;

import java.io.ObjectOutputStream;

import java.text.ParseException;

import java.text.SimpleDateFormat;

import java.time.Instant;

import java.time.LocalDate;

import java.time.format.DateTimeFormatter;

import java.util.ArrayList;

import java.util.Date;

import java.util.HashMap;

import java.util.HashSet;

import java.util.List;

import java.util.Map;

import java.util.Scanner;

import java.util.Set;

public class AppTest {

public static void main(String[] args) throws IOException,

ClassNotFoundException {

Scanner sc = new Scanner(System.in);

int ch, k, v;

String t, d;

double p;

while (true) {

System.out.println("01. Add a Book");

System.out.println("02. Add a Subject");

System.out.println("03. Delete a Book");

System.out.println("04. Delete a Subject");

System.out.println("05. Search for a book");

System.out.println("06. Search for a subject");

System.out.println("07. Exit");

System.out.print("Enter Your Choice : ");

ch = sc.nextInt();

switch (ch) {

case 1:

System.out.println("01. Add a Book");

AddBook();

break;

case 2:

System.out.println("02. Add a Subject");

AddSubject();

break;

case 3:

System.out.println("03. Delete a Book");

Scanner sc3 = new Scanner(System.in);

System.out.println("Enter Book tittle");

String tittle1 = sc3.next();

deleteBook(tittle1);

break;

case 4:

System.out.println("03. Delete a Subject");

Scanner sc4 = new Scanner(System.in);

System.out.println("Enter Book tittle");

String tittle3 = sc4.next();

deleteSubject(tittle3);

break;

case 5:

System.out.println("05. Search for a book");

try {

Scanner sc6 = new Scanner(System.in);

System.out.println("Enter Book tittle");

String tittle5 = sc6.next();

Set<Book> sb1 = retriveBook(tittle5);

System.out.println("searched book =====" + sb1);

} catch (ClassNotFoundException e) {

e.printStackTrace();

}

break;

case 6:

System.out.println("06. Search for a subject");

try {

// Set<Book> sb1=retriveBook("www");

Scanner sc2 = new Scanner(System.in);

System.out.println("Enter subject tittle");

String tittle = sc2.next();

retriveSubject(tittle);

// System.out.println("sb1====="+sb1);

} catch (ClassNotFoundException e) {

// TODO Auto-generated catch block

e.printStackTrace();

}

break;

case 7:

System.out.println("Exited");

System.exit(0);

default:

System.out.println("Wrong Entry");

}

}

}

private static void deleteSubject(String subjecttittle)

throws ClassNotFoundException, IOException {

Set<Book> setbook = new HashSet<Book>();

Map<Integer, Subject> map = new HashMap<Integer, Subject>();

FileInputStream fint = new FileInputStream("D:\\f2.txt");

ObjectInputStream oint = new ObjectInputStream(fint);

Subject subject = (Subject) oint.readObject();

System.out.println("Before remove subject>>>>>>>>>>>>>>>>>>"

+ subject.toString());

if (subject.getSubtitle().equals(subjecttittle)) {

setbook = subject.getReferences();

}

for (Book book : setbook) {

if (book.getTitle().equals(subjecttittle)) {

setbook.remove(book);

}

}

System.out.println("After remove subject>>>>>>>>>>>>>>>>>>" + setbook);

}

private static void deleteBook(String title) throws ClassNotFoundException,

IOException {

Set<Book> s2 = retriveBook(title);

System.out.println("before remove " + s2);

// Scanner sc=new Scanner(System.in);

// System.out.println("enter bookid to delete");

// int bid=sc.nextInt();

for (Book book : s2) {

s2.remove(book);

}

System.out.println("after remove" + s2);

}

private static void AddSubject() throws IOException {

List<Subject> s1 = new ArrayList<Subject>();

Scanner sc0 = new Scanner(System.in);

System.out.println("enter total entry--------\n");

int total = sc0.nextInt();

// Book b1=null;

for (int i = 0; i < total; i++) {

Scanner sc = new Scanner(System.in);

System.out.println("enter subjectId");

long k = sc.nextInt();

System.out.println("enter subtitle");

String t = sc.next();

System.out.println("enter durationInHours");

int p = sc.nextInt();

Set<Book> mapsubject = null;

try {

mapsubject = retriveBook(t);

System.out.println("mapsubject>>>>>>>>>>>>>" + mapsubject);

// mapsubject = getBook(t);

} catch (ClassNotFoundException e) {

// TODO Auto-generated catch block

e.printStackTrace();

}

FileOutputStream fout = new FileOutputStream("D:\\f2.txt");

ObjectOutputStream out = new ObjectOutputStream(fout);

out.writeObject(new Subject(k, t, p, mapsubject));

out.flush();

System.out.println("success");

}

}

private static Set<Book> getBook(String t) throws IOException,

ClassNotFoundException {

Set<Book> sb = new HashSet<Book>();

FileInputStream fint = new FileInputStream("D:\\f.txt");

ObjectInputStream oint = new ObjectInputStream(fint);

Map<String, Book> sbook = (Map<String, Book>) oint.readObject();

System.out.println("Set of books----------" + sbook);

Book book = new Book();

Set<String> set = sbook.keySet();

for (String str : set) {

if (set.contains(t)) {

sb.add(sbook.get(str));

}

}

fint.close();

oint.close();

return sb;

}

private static Set<Book> retriveSubject(String tittle)

throws ClassNotFoundException, IOException {

Set<Book> sb = new HashSet<Book>();

Set<Book> sb1 = new HashSet<Book>();

FileInputStream fint = new FileInputStream("D:\\f2.txt");

ObjectInputStream oint = new ObjectInputStream(fint);

Subject subject = (Subject) oint.readObject();

System.out.println("subject----------" + subject.toString());

if (subject.getSubtitle().equals(tittle)) {

System.out.println("retriveSubject>>>>>>>>>>>>>>"

+ subject.getSubjectId() + "----"

+ subject.getDurationInHours() + "--------"

+ subject.getSubtitle() + "----" + subject.getReferences());

}

fint.close();

oint.close();

return sb;

}

private static Set<Book> retriveBook(String tittle)

throws ClassNotFoundException, IOException {

Set<Book> sb = new HashSet<Book>();

FileInputStream fint = new FileInputStream("D:\\f.txt");

ObjectInputStream oint = new ObjectInputStream(fint);

Map<String, Book> sbook = (Map<String, Book>) oint.readObject();

System.out.println("Set of books----------" + sbook);

Book book = new Book();

Set<String> set = sbook.keySet();

for (String str : set) {

if (str.equals(tittle)) {

sb.add(sbook.get(str));

}

}

fint.close();

oint.close();

return sb;

}

public static Map<String, Book> AddBook() throws IOException {

// Set<Book> s1 = new HashSet<Book>();

Map<String, Book> map = new HashMap<String, Book>();

Scanner sc0 = new Scanner(System.in);

System.out.println("enter total entry--------");

int total = sc0.nextInt();

// Book b1=null;

for (int i = 0; i < total; i++) {

Scanner sc = new Scanner(System.in);

System.out.println("enter bookid");

int k = sc.nextInt();

System.out.println("enter book title");

String t = sc.next();

System.out.println("enter book price");

double p = sc.nextDouble();

System.out.println("enter book volume");

int v = sc.nextInt();

System.out.println("enter book publish date");

String date = sc.next();

LocalDate d = LocalDate.parse(date);

map.put(t, new Book(k, t, p, v, d));

}

FileOutputStream fout = new FileOutputStream("D:\\f.txt");

ObjectOutputStream out = new ObjectOutputStream(fout);

out.writeObject(map);

out.flush();

System.out.println("success");

return map;

}

}

**Console o/p:-**

01. Add a Book

02. Add a Subject

03. Delete a Book

04. Delete a Subject

05. Search for a book

06. Search for a subject

07. Exit

Enter Your Choice : 01

01. Add a Book

enter total entry--------

2

enter bookid

101

enter book title

che1

enter book price

10000

enter book volume

1

enter book publish date

2014-02-03

enter bookid

102

enter book title

che2

enter book price

20000

enter book volume

2

enter book publish date

2015-01-02

success

01. Add a Book

02. Add a Subject

03. Delete a Book

04. Delete a Subject

05. Search for a book

06. Search for a subject

07. Exit

Enter Your Choice : 05

05. Search for a book

Enter Book tittle

che2

Set of books----------{che2=Book [bookId=102, title=che2, price=20000.0, volume=2, publishDate=2015-01-02], che1=Book [bookId=101, title=che1, price=10000.0, volume=1, publishDate=2014-02-03]}

searched book =====[Book [bookId=102, title=che2, price=20000.0, volume=2, publishDate=2015-01-02]]

01. Add a Book

02. Add a Subject

03. Delete a Book

04. Delete a Subject

05. Search for a book

06. Search for a subject

07. Exit

Enter Your Choice : 02

02. Add a Subject

enter total entry--------

1

enter subjectId

1

enter subtitle

che1

enter durationInHours

12

Set of books----------{che2=Book [bookId=102, title=che2, price=20000.0, volume=2, publishDate=2015-01-02], che1=Book [bookId=101, title=che1, price=10000.0, volume=1, publishDate=2014-02-03]}

mapsubject>>>>>>>>>>>>>[Book [bookId=101, title=che1, price=10000.0, volume=1, publishDate=2014-02-03]]

success

01. Add a Book

02. Add a Subject

03. Delete a Book

04. Delete a Subject

05. Search for a book

06. Search for a subject

07. Exit

Enter Your Choice : 06

06. Search for a subject

Enter subject tittle

che1

subject----------Subject [subjectId=1, subtitle=che1, durationInHours=12, references=[Book [bookId=101, title=che1, price=10000.0, volume=1, publishDate=2014-02-03]]]

retriveSubject>>>>>>>>>>>>>>1----12--------che1----[Book [bookId=101, title=che1, price=10000.0, volume=1, publishDate=2014-02-03]]

01. Add a Book

02. Add a Subject

03. Delete a Book

04. Delete a Subject

05. Search for a book

06. Search for a subject

07. Exit

Enter Your Choice : 02

02. Add a Subject

enter total entry--------

1

enter subjectId

2

enter subtitle

che2

enter durationInHours

13

Set of books----------{che2=Book [bookId=102, title=che2, price=20000.0, volume=2, publishDate=2015-01-02], che1=Book [bookId=101, title=che1, price=10000.0, volume=1, publishDate=2014-02-03]}

mapsubject>>>>>>>>>>>>>[Book [bookId=102, title=che2, price=20000.0, volume=2, publishDate=2015-01-02]]

success

01. Add a Book

02. Add a Subject

03. Delete a Book

04. Delete a Subject

05. Search for a book

06. Search for a subject

07. Exit

Enter Your Choice : 06

06. Search for a subject

Enter subject tittle

che2

subject----------Subject [subjectId=2, subtitle=che2, durationInHours=13, references=[Book [bookId=102, title=che2, price=20000.0, volume=2, publishDate=2015-01-02]]]

retriveSubject>>>>>>>>>>>>>>2----13--------che2----[Book [bookId=102, title=che2, price=20000.0, volume=2, publishDate=2015-01-02]]

01. Add a Book

02. Add a Subject

03. Delete a Book

04. Delete a Subject

05. Search for a book

06. Search for a subject

07. Exit

Enter Your Choice : 03

03. Delete a Book

Enter Book tittle

che1

Set of books----------{che2=Book [bookId=102, title=che2, price=20000.0, volume=2, publishDate=2015-01-02], che1=Book [bookId=101, title=che1, price=10000.0, volume=1, publishDate=2014-02-03]}

before remove [Book [bookId=101, title=che1, price=10000.0, volume=1, publishDate=2014-02-03]]

after remove[]

01. Add a Book

02. Add a Subject

03. Delete a Book

04. Delete a Subject

05. Search for a book

06. Search for a subject

07. Exit

Enter Your Choice : 04

03. Delete a Subject

Enter Book tittle

che1

Before remove subject>>>>>>>>>>>>>>>>>>Subject [subjectId=2, subtitle=che2, durationInHours=13, references=[Book [bookId=102, title=che2, price=20000.0, volume=2, publishDate=2015-01-02]]]

After remove subject>>>>>>>>>>>>>>>>>>[]

01. Add a Book

02. Add a Subject

03. Delete a Book

04. Delete a Subject

05. Search for a book

06. Search for a subject

07. Exit

Enter Your Choice : 07

Exited