# Subject.java

**package** com.fsd.corejava.bo;

**import** java.io.Serializable;

**import** java.util.Set;

/\*\*

\* **@author** Sudhir Kumar Thakur

\*

\*/

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

**private** **static** **final** **long** ***serialVersionId*** = 1L;

**private** **long** subjectId;

**private** String subjectTitle;

**private** **int** durationInHours;

**private** Set<Book> references;

**public** Subject() {

};

**public** Subject(**long** subjectId, String subTitle, **int** durationInHours, Set<Book> references) {

**super**();

**this**.subjectId = subjectId;

**this**.subjectTitle = subTitle;

**this**.durationInHours = durationInHours;

**this**.references = references;

}

/\*\*

\* **@return** the subjectId

\*/

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

**return** subjectId;

}

/\*\*

\* **@param** subjectId the subjectId to set

\*/

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

**this**.subjectId = subjectId;

}

/\*\*

\* **@return** the subTitle

\*/

**public** String getSubTitle() {

**return** subjectTitle;

}

/\*\*

\* **@param** subTitle the subTitle to set

\*/

**public** **void** setSubTitle(String subTitle) {

**this**.subjectTitle = subTitle;

}

/\*\*

\* **@return** the durationInHours

\*/

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

**return** durationInHours;

}

/\*\*

\* **@param** durationInHours the durationInHours to set

\*/

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

**this**.durationInHours = durationInHours;

}

/\*\*

\* **@return** the references

\*/

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

**return** references;

}

/\*\*

\* **@param** references the references to set

\*/

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

**this**.references = references;

}

/\*

\* (non-Javadoc)

\*

\* @see java.lang.Object#toString()

\*/

@Override

**public** String toString() {

**return** "Subject [subjectId=" + subjectId + ", subTitle=" + subjectTitle + ", durationInHours=" + durationInHours

+ ", references=" + references + "]";

}

}

# Book.java

**package** com.fsd.corejava.bo;

**import** java.io.Serializable;

**import** java.time.LocalDate;

/\*\*

\* **@author** Sudhir Kumar Thakur

\*

\*/

**public** **class** Book **implements** Serializable {

**private** **static** **final** **long** ***serialVersionId*** = 1L;

**private** **long** bookId;

**private** String title;

**private** **double** price;

**private** Integer volume;

**private** LocalDate publishDate;

**public** Book() {

};

**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;

}

/\*\*

\* **@return** the bookId

\*/

**public** **long** getBookId() {

**return** bookId;

}

/\*\*

\* **@param** bookId the bookId to set

\*/

**public** **void** setBookId(**long** bookId) {

**this**.bookId = bookId;

}

/\*\*

\* **@return** the title

\*/

**public** String getTitle() {

**return** title;

}

/\*\*

\* **@param** title the title to set

\*/

**public** **void** setTitle(String title) {

**this**.title = title;

}

/\*\*

\* **@return** the price

\*/

**public** **double** getPrice() {

**return** price;

}

/\*\*

\* **@param** price the price to set

\*/

**public** **void** setPrice(**double** price) {

**this**.price = price;

}

/\*\*

\* **@return** the volume

\*/

**public** Integer getVolume() {

**return** volume;

}

/\*\*

\* **@param** volume the volume to set

\*/

**public** **void** setVolume(Integer volume) {

**this**.volume = volume;

}

/\*\*

\* **@return** the publishDate

\*/

**public** LocalDate getPublishDate() {

**return** publishDate;

}

/\*\*

\* **@param** publishDate the publishDate to set

\*/

**public** **void** setPublishDate(LocalDate publishDate) {

**this**.publishDate = publishDate;

}

/\*

\* (non-Javadoc)

\*

\* @see java.lang.Object#toString()

\*/

@Override

**public** String toString() {

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

+ ", publishDate=" + publishDate + "]";

}

}

# BookManipulation.java

**package** com.fsd.corejava.bo.impl;

/\*\*

\* **@author** Sudhir Kumar Thakur

\*

\*/

**import** java.io.BufferedReader;

**import** java.io.EOFException;

**import** java.io.File;

**import** java.io.FileInputStream;

**import** java.io.FileNotFoundException;

**import** java.io.FileOutputStream;

**import** java.io.IOException;

**import** java.io.InputStreamReader;

**import** java.io.ObjectInputStream;

**import** java.io.ObjectOutputStream;

**import** java.time.LocalDate;

**import** java.util.ArrayList;

**import** java.util.HashSet;

**import** java.util.List;

**import** java.util.Set;

**import** com.fsd.corejava.bo.Book;

**import** com.fsd.corejava.bo.Subject;

**public** **class** BookManipulation {

**static** FileOutputStream *fileOutputStream* = **null**;

**static** ObjectOutputStream *objectOutputStream* = **null**;

**static** {

**try** {

*fileOutputStream* = **new** FileOutputStream(**new** File("MyFileNew.txt"));

*objectOutputStream* = **new** ObjectOutputStream(*fileOutputStream*);

} **catch** (Exception e) {

e.printStackTrace();

}

}

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

**char** select;

**do** {

Boolean isBookType = Boolean.***FALSE***;

System.***out***.println("please select menu items::::::::::::::::");

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

System.***out***.println("b.Add a Book");

System.***out***.println("c.Delete a Subject");

System.***out***.println("d.Delete a book");

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

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

System.***out***.println("g.Exit");

BufferedReader br = **new** BufferedReader(**new** InputStreamReader(System.***in***));

select = br.readLine().charAt(0);

**switch** (select) {

**case** 'a':

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

System.***out***.println("Enter Subject Id: ");

Subject subject = **new** Subject();

**long** subjectId = Long.*parseLong*(br.readLine());

subject.setSubjectId(subjectId);

System.***out***.println("Enter Subject Title: ");

String subjectTitle = br.readLine();

subject.setSubTitle(subjectTitle);

System.***out***.println("Enter Subject Duration in Hours: ");

String durationInHours = br.readLine();

subject.setDurationInHours(Integer.*parseInt*(durationInHours));

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

Book b1 = **new** Book(1L, "Java", 100.0, 300, LocalDate.*now*());

refSet.add(b1);

subject.setReferences(refSet);

*fileWriter*(subject, isBookType);

**break**;

**case** 'b':

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

System.***out***.println("Enter Book Id: ");

Book book = **new** Book();

**long** bookId = Long.*parseLong*(br.readLine());

book.setBookId(bookId);

System.***out***.println("Enter Book Title: ");

String bookTitle = br.readLine();

book.setTitle(bookTitle);

System.***out***.println("Enter price: ");

**double** price = Double.*parseDouble*(br.readLine());

book.setPrice(price);

System.***out***.println("Enter volume: ");

**int** volume = br.read();

book.setVolume(volume);

LocalDate publishDate = LocalDate.*now*();

book.setPublishDate(publishDate);

isBookType = Boolean.***TRUE***;

*fileWriter*(book, isBookType);

**break**;

**case** 'c':

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

System.***out***.println("Enter Subject Id to delete: ");

**long** subId = Long.*parseLong*(br.readLine());

*removeFileObj*(subId, isBookType);

**break**;

**case** 'd':

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

System.***out***.println("Enter Book Id to delete: ");

**long** bId = Long.*parseLong*(br.readLine());

isBookType = Boolean.***TRUE***;

*removeFileObj*(bId, isBookType);

**case** 'e':

System.***out***.println("<---Search for a Book--->");

System.***out***.println("Enter Book Id to Search: ");

**long** bookIdSearch = Long.*parseLong*(br.readLine());

isBookType = Boolean.***TRUE***;

*fileReader*(bookIdSearch, isBookType);

**break**;

**case** 'f':

System.***out***.println("<---Search for a Subject--->");

System.***out***.println("Enter Subject Id to Search: ");

**long** SubIdSearch = Long.*parseLong*(br.readLine());

*fileReader*(SubIdSearch, isBookType);

**break**;

}

} **while** (select != 'g');

}

// Write Object to File method

**public** **static** **void** fileWriter(Object obj, Boolean isBookType) {

**try** {

// Write Object to file

*objectOutputStream*.writeObject(obj);

**if** (isBookType) {

System.***out***.println("Book has been added successfully");

} **else** {

System.***out***.println("Subject has been added successfully");

}

} **catch** (FileNotFoundException e) {

e.printStackTrace();

} **catch** (IOException e) {

e.printStackTrace();

}

}

// Read Object to File method

**public** **static** **void** fileReader(**long** searchId, Boolean isBookType) {

**try** {

FileInputStream fi = **new** FileInputStream(**new** File("MyFileNew.txt"));

ObjectInputStream oi = **new** ObjectInputStream(fi);

List objList = **new** ArrayList();

// Read Object from file

**while** (**true**) {

**try** {

objList.add(oi.readObject());

} **catch** (EOFException e) {

// **TODO**: handle exception

**break**;

} **catch** (ClassNotFoundException e) {

// **TODO** Auto-generated catch block

e.printStackTrace();

}

}

List<Book> bookList = **new** ArrayList<>();

List<Subject> subjectList = **new** ArrayList<>();

**for** (Object obj1 : objList) {

**try** {

Book bookObj = (Book) obj1;

bookList.add(bookObj);

} **catch** (Exception e) {

Subject subObj = (Subject) obj1;

subjectList.add(subObj);

// **TODO**: handle exception

}

}

System.***out***.println("objList: " + objList);

System.***out***.println("BookList: " + bookList);

System.***out***.println("SubjectList: " + subjectList);

Object searchItem = **null**;

**if** (isBookType) {

**for** (Book bObj : bookList) {

**if** (bObj.getBookId() == searchId) {

searchItem = bObj;

System.***out***.println("Book Details: " + searchItem);

**break**;

}

}

**if** (searchItem == **null**) {

System.***out***.println("No Data found...");

}

} **else** {

**for** (Subject sObj : subjectList) {

**if** (sObj.getSubjectId() == searchId) {

searchItem = sObj;

System.***out***.println("Subject Details: " + searchItem);

**break**;

}

}

**if** (searchItem == **null**) {

System.***out***.println("No Data found...");

}

}

} **catch** (FileNotFoundException e) {

e.printStackTrace();

} **catch** (IOException e) {

e.printStackTrace();

}

}

// Remove a object from File

**public** **static** **void** removeFileObj(**long** objectId, Boolean isBookType) {

**try** {

FileInputStream fi = **new** FileInputStream(**new** File("MyFileNew.txt"));

ObjectInputStream oi = **new** ObjectInputStream(fi);

List objList = **new** ArrayList();

// Read Object from file

**while** (**true**) {

**try** {

objList.add(oi.readObject());

} **catch** (EOFException e) {

**break**;

} **catch** (ClassNotFoundException e) {

e.printStackTrace();

}

}

// Create 2 different lists based on object type

List<Book> bookList = **new** ArrayList<>();

List<Subject> subjectList = **new** ArrayList<>();

**for** (Object obj1 : objList) {

**try** {

Book bookObj = (Book) obj1;

bookList.add(bookObj);

} **catch** (Exception e) {

Subject subObj = (Subject) obj1;

subjectList.add(subObj);

}

}

Object removeObj = **null**;

**if** (isBookType) {

**for** (Book bObj : bookList) {

**if** (bObj.getBookId() == objectId) {

System.***out***.println("Book Details: " + bObj);

removeObj = bObj;

**break**;

}

}

} **else** {

**for** (Subject sObj : subjectList) {

**if** (sObj.getSubjectId() == objectId) {

System.***out***.println("Subject Details: " + sObj);

removeObj = sObj;

**break**;

}

}

}

**if** (removeObj == **null**) {

System.***out***.println("No match found..");

} **else** {

objList.remove(removeObj);

}

System.***out***.println("Updated objList: " + objList);

//Writing the updated list to file

FileOutputStream fo = **new** FileOutputStream(**new** File("MyFileNew.txt"));

ObjectOutputStream os = **new** ObjectOutputStream(fo);

**for** (Object obj : objList) {

os.writeObject(obj);

}

**if** (isBookType && removeObj != **null**) {

System.***out***.println("Book has been removed Successfully");

} **else** **if** (isBookType && removeObj != **null**) {

System.***out***.println("Subject has been removed Successfully");

}

} **catch** (FileNotFoundException e) {

e.printStackTrace();

} **catch** (IOException e) {

e.printStackTrace();

}

}

}

# Output Screenshot:



















