



IBasicOperations	IBookOperations
void borrow(Patron p, Book b) void return(Patron p, Book b) void fine(Patron p, double amount)	void insertBook(Book b) void removeBook(Book b) Book getBook(int bookId) void showAllBooks()
ITeacherOperations	IStudentOperations
void insertTeacher(Teacher t) void removeTeacher(Teacher t) Teacher getTeacher(String teacherId) void showAllTeachers()	void insertStudent(Student s) void removeStudent(Student s) Student getStudent(String studentId) void showAllStudents()

IBasicOperations, IBookOperations, ITeacherOperations, IStudentOperations are Interface.

Library	Librarian	Book
String libraryName String address Student students[] Teacher teachers[] Book books[] int noOfBooks Librarian librarian	String name String LibrarianId double salary int age void setName(String name) void setID(int nid) void setSalary(double salary) void setAge(int age) String getName() int getID() double getSalary() int getAge() void generateFine(Patron P, double amount)	int id String title String subtitle String authorName String publisherName double price int noOfCopy void setId(int id) void setTitle(String title) void setSubTitle(String subTitle) void setAuthor(String author) void setPublisher(String publisher) void setPrice(double price) void setNoOfCopy(int noOfCopy) int getID() String getTitle() String getAuthorName() String publisherName() Double getPrice() Int getNoOfCopy()

Patron
String ID String name String departmentName String email String contactNo String address double amount
void setId(String id) void setName(String name) void setDepartmentName(String departmentName) void setEmail(String email) void setContactNo(String contactNo) void setAddress(String address) String getId() void setAmount(double amount) String getName() String getDepartmentName() String getEmail() String getContactNo() String getAddress() double getAmount() abstract void showInfo()

Student
String guardianName String guardianContactNo
void setGuardianName(String guardianName) void setGuardianContactNo(String guardianContactNo) String getGuardianName() String getGuardianContactNo()

Teacher
int officeRoomNo
void setOfficeRoomNo(int officeRoomNo) int getOfficeRoomNo()

Start
<p>The Start class contains the main method. Inside the main method the application prompts the user to choose among the following options:</p> <div><div>1. Student Management</div><div>2. Teacher Management</div><div>3. Book Management</div><div>4. Borrow/ Lost management</div><div>5. Exit</div></div> <p>Upon choosing any of the option the user is given some further options to choose from:</p> <p><i>Options for Student Management:</i></p> <div><div>1. Insert New Student</div><div>2. Remove Existing Student</div><div>3. Show All Student</div></div> <p><i>Options for Teacher Management:</i></p> <div><div>1. Insert New Teacher</div><div>2. Remove Existing Teacher</div><div>3. Show All Teacher</div></div> <p><i>Options for Book Management:</i></p> <div><div>1. Insert New Book</div><div>2. Remove Existing Book</div><div>3. Show All Books</div></div> <p>Options for Book Borrow/Lost management:</p> <div><div>1. Borrow book</div><div>2. Return Book</div><div>3. Generate Fine</div></div> <p>The application will prompt the user to give input for the necessary values as per the choice. The application will repeatedly go on according to the user choices.</p>

Requirements:

- Object Oriented Programming Principles must be followed.
- The whole program must be organized using **at least three user defined packages**.
- Whenever a book has been borrowed or returned, the details has to be written in a text file.
- The program must be able to handle exceptions by itself.