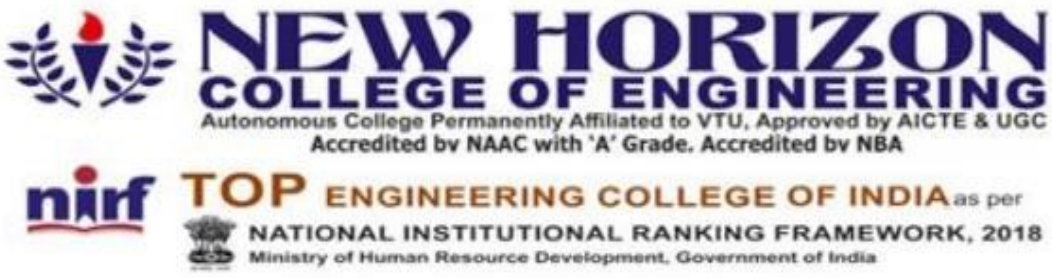


LIBRARY INFORMATION TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

A MINI PROJECT REPORT

Submitted by

P.SAHITHYA

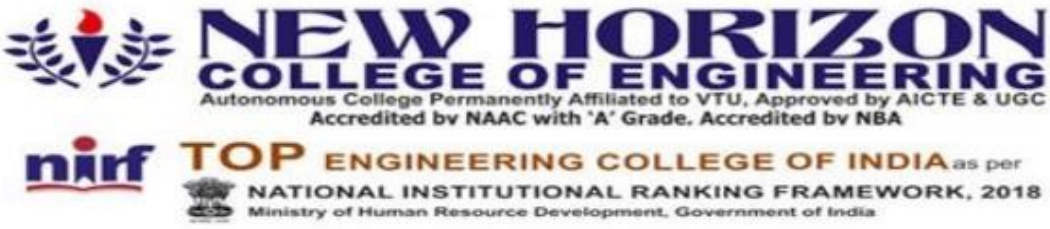
USN: 1NH18CS133

In partial fulfilment for the award of the degree of

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE AND ENGINEERING



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Certificate

This is to certify that the mini project work titled

LIBRARY INFORMATION TECHNOLOGY

Submitted in partial fulfilment of the degree of Bachelor of

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Library Information Technology

ORIGINALITY REPORT

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SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Vaskaran Sarcar. "Interactive Object-Oriented Programming in Java", Springer Science and Business Media LLC, 2020 Publication	1%
2	Daniel Solis, Cal Schrotenboer. "Illustrated C# 7", Springer Science and Business Media LLC, 2018 Publication	<1%
3	Tony Jenkins, Graham Hardman. "How to Program Using Java", Springer Science and Business Media LLC, 2004 Publication	<1%
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5	Jayasundara, Chaminda Chiran. "A Modular approach to Customer Satisfaction in Relation to Service Quality", Journal of the University Librarians Association of Sri Lanka, 2011. Publication	<1%

ABSTRACT

The main goal of Library Information technology is to store, organize, share and retrieve vital information needed to carry out daily operational functions of the library. Which will facilitates the number of options like maintenance of books data, updating book data, borrower information, updating borrower information, issuing a book, retuning a book etc. By this we can maintain issue and return data every day. We can maintain a file in an easier way.

The manual maintenance of library daily activities is very difficult. In a day there may be hundreds or thousands of persons used to take and return the books which will confuse more time for issuing and returning and for maintaining the data. Thus it reduces the time consumption library information technology is been implemented on java.

ACKNOWLEDGEMENT

The satisfaction and euphoria that accompany the successful completion of any task would be impossible without the mention of the people who made it possible, whose constant guidance and encouragement crowned our efforts with success.

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P.SAHITHYA

(1NH18CS133)

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CHAPTER 1

INTRODUCTION

The Library information Technology is supposed for maintaining info of books, borrower's information and primarily concerning the issues and returns. It provides search facility of books, borrowers, issues and returns information. It facilitates to issue and returns books in a better manner during which it shows the higher information. It's all concerning organizing, managing the library and library directed tasks. Library is a crucial place for the folks particularly the scholars that helps the scholars in their learning method and understands the ideas in higher manner. Because it appears necessary for the scholars, library ought to be able to offer a peaceful atmosphere so as to assist the scholars to try and do their revision. In different words, student satisfaction is a crucial live of quality whereas providing the services in libraries. However, students' perceptions concerning libraries appear to possess been for the most part neglected by library management in developing countries. So, the assessment of quality whereas giving the services provides a crucial feedback for libraries to assess and improve its services to its use

Good service delivery to students is one in all the first goals of service organizations like libraries and is that the ability of any service supplier to produce secure product or services. Historically, the success of any library is measured in terms of the dimensions of its assortment, staff, and budget. However within the gift day competitive world, the libraries got to transcend the normal modes of assessments and apply selling techniques for understanding client necessities. Students focus in services delivery is important for satisfying the scholars. The success depends on students' perceptions or judgment on the standard of products/services provided by the service personnel in libraries and quality is that the live off however well the products/ services delivered meet student's expectations.

1.1 PROBLEM DEFINATION

The manual maintenance of library daily activities is extremely troublesome. During a day there is also lots of or thousands of persons accustomed take and return the books which are able to confuse longer for issuance and returning and for maintaining the information. Therefore it reduces the time consumption library information technology is been enforced on java.

Quality services in library square measure vital facet so as to satisfy the scholars through having continuous improvement and also the students perception is a crucial facet to reveal however glad the scholars towards the library contribution in serving to them in learning method. Library should offer a decent quality of services, adequate of collection/information, smart activities and employee's perspective at constant time determination the difficult featured by them. If the challenges featured not being solved,

it'll create student's satisfaction become lower and it's exhausting for the scholars to search out what they need within the library. Therefore, library should establish what reasonably resolution that must be drained order to face the challenges since once a year new students go together with completely different wants and expectations.

The main goal of Library information technology is to store, organize, share and retrieve very important information required to hold out daily operational functions of the library. This is able to facilitate the quantity of choices like maintenance of books information, change book information, recipient info, change recipient info, issuance a book, retuning a book etc. By this we will maintain issue and return information a day. We will maintain a get into a better manner.

1.2 OBJECTIVES

The main objective of the library information technology is to manage the main points of Address member, problems books; student. The purpose of the project is to create a program to scale back the manual work for managing the address, member, librarian, issues. The package keeps the track of all the knowledge concerning the books and their complete details.

It will mainly establishment of a well storage and retrieval system. To develop and update the objectives of a library square measure related to its parent body i.e. community and its duty is to cater to the knowledge and recreational wants of its users i.e. community members.

This maintains the most record of the books within the library. It's a main growing organism that primarily needs the constant positive changes to the most changes of the users.

The most objectives of a library square measure as follows:

1. To produce up-to-date and authentic info on all subjects;
2. To produce services freed from value or at nominal rates to every member of the society with none discrimination;
3. To produce a harmless and elevating use of leisure;
4. To be answerable for preservation and development of cultural and antiquarian heritage of the community

1.3 METHODOLOGY TO BE FOLLOWED

In this project I am using the object oriented concepts a main topic to determine how to use the Library information technology. To collect the actual information about the library from the original record of the organization.

- In this project, it gives the choice for the user that whether they want to create book files, add records to the book file, search by book number or generate report.
- If a user wants to create a book file or add to the book file then they gets option such as create, search, and update. User can choose based on their needs.
- If the user wants to search the book then they have to enter the book number. If book is present then it displays the whole details of book.
- If user clicks on the option generate report then it displays all the books along with the details.

This is how the project deals with the Library Information Technology.

1.4 EXPECTED OUTCOMES

The output of the system is displayed on the console during a formatted manner. The output may attend a file (file style already explained).

* Books information

* Borrowers information

* Issues and returns

* Exit

1.5 REQUIREMENT SPECIFICATIONS:

1.51HARDWARE REQUIREMENTS

Processor	: Any Processor above 500 MHz
RAM	: 512Mb
Hard Disk	: 10 GB
Input device	: Standard Keyboard and Mouse
Output device	: VGA and High Resolution Monitor

1.52 SOFTWARE REQUIREMENTS

- Operating system : Windows XP
- Front End : ASP.Net 2.0
- Server : Internet Information Services
- Database Connectivity : ODBC Sources (with SQL Server)

CHAPTER 2

OBJECT ORIENTED CONCEPTS

Java is an object-oriented program, platform independent, multi-purpose programming language which is produced by Sun Micro system which is currently the subsidiary of Oracle. Java is a high-level programming language which is portable and platform independent. Java is fast, secure and reliable. It was first released in the year 1995; it was developed to be a machine independent web technology. It was developed based on C and C++ language syntax to make it easy and simple for programmers. Since then, Java has earned a prominent place in the world of computer programming.

FEATURES OF JAVA / CHARACTERISTICS OF JAVA / BUZZWORDS OF JAVA ARE:

- Simple
- Secure
- High performance
- Object oriented
- Distributed
- Complied and Interpreted
- Portable
- Dynamic
- Architecture neutral
- Robust
- Multithread

SIMPLE

Java was designed to make easy for professional programmers to learn quickly and use effectively. It is simple and easy to learn for the programmer who already know the basic concepts of C / C++ language because It was developed from C / C ++ Language syntax.

SECURE

Java is confined solely to the Java execution environment- JVM (JAVA VIRTUAL MACHINE). When a web browser of java compatible is used, downloading can be done safely and easily without any concern or fear of viral infections.

HIGH PERFORMANCE

Performance of the Java is high because of usage of the byte code. Byte code is the instruction set designed for the efficient execution. Byte code simply interprets the code into native machine code thus it enables us to execute in any operating system. Java is faster when compared with other traditional interpreted programming language.

OBJECT ORIENTED

Java is an object-oriented language. All the program code and data reside within the objects and classes. The object model in Java is simple, easy to extend, easy to maintain and it is also reusability. Java comes with an extensive group of classes that are organized in packages which may be used in programs through inheritance.

DISTRIBUTED

Java is intended to develop a distributed environment. Java is used for creating applications on network. It permits programmers in multiple remote locations to collaborate and work together on a single project.

COMPILED AND INTERPRETED

Computer language is either compiled or interpreted. But Java combines both compiled and interpreted and makes it into two stage system.

- **COMPILED:** Java enables the creation of a cross platform programs by compiling it into an intermediate representation which is called Java Bytecode.
- **INTERPRETED:** After compiled, Byte code is interpreted which generates machine code that can be directly executed by the machine which provides a Java Virtual Machine.

PORTABLE

It helps in generating Portable executable code by providing a way to download programs dynamically to all various kinds of platforms connected to the internet.

DYNAMIC

Java can link in new methods and strategies, new class libraries and objects. It can also link native methods (the function which is written in different programming language such as C and C++). It additionally has a compilation and automatic memory management.

ARCHITECTURE NEUTRAL

Java language and Java Virtual Machine (JVM) helped in achieving the goal i.e, "WRITE ONCE; RUN ANYWHERE, ANY TIME, FOREVER". change in operating systems or update in operating systems, processor and system resources will not force any changes in Java programs.

ROBUST

It provides strong memory management, avoids security issues, automatic garbagecollection and additionally exception handling. It also provides several options that build the program execute reliably in numerous types of environment. Java is strictly typed language/ written Language which checks the code both at compile time and runtime.

MULTITHREADED

It helps in parallel execution i.e., several tasks performing at once. Multithreaded programs handle multiple tasks at the same time that helps in creating interactive, networked programs. Java run time systems support the synchronization of multi process which is used to construct smoothly interactive systems.

JAVA ENVIRONMENT

The programming Java environment consists of three components mainly:

- Java Development Kit (JDK)
- Java Runtime Environment (JRE)
- Java Virtual Machine (JVM)

These three components / elements are platform dependent because the configuration of each Operating System is totally different from one another. Whereas, Java is platform independent.

1) JAVA DEVELOPMENT KIT (JDK)

JDK is the environment for software development which is used to develop Java applications and applets.

SEVEN MAIN TOOLS IN JDK ARE: -

- The Java compiler - javac
- The Java interpreter - Java
- Generates documentation in HTML - javadoc
- The Java interpreter to execute Java applets - appletviewer
- The java debugger to sort out bugs and fix bugs in Java program - jdb
- The Java disassemble to displays the accessible functions, information and data - javap
- To Create interface between Java and C routines – javah

2) JAVA RUNTIME ENVIRONMENT (JRE)

JRE provides minimum needs (requirements) for executing a Java application. It includes the Java Virtual Machine (JVM), core classes and supporting files.

3) JAVA VIRTUAL MACHINE (JVM)

JVM is an abstract machine. It is additionally called as Virtual Machine because it doesn't exit physically. It can run other programs which are written in other languages and compiled to Java bytecode. It can also provide a run-time environment in which Java bytecode can be executed.

The three notions of JVM are:

- **SPECIFICATION**The operating of Java Virtual Machine (JVM) is fixed whereas the implementation provided was independent to pick out the algorithm. Implementation of JVM was provided by Oracle and other companies.
- **IMPLEMENTATION:** It is a computer program which meets the requirements of the Java Virtual Machine's specification. Its implementation is additionally known as Java Runtime Environment (JRE).
- **RUNTIME INSTANCE:** An instance of JVM is formed when the programmer writes Java command on the command prompt to run the Java class

JVM performs few main tasks such as loads the code, verifies/checks the code and eventually executes the code.

- The main method which is present in Java code was called by JVM.
- JVM is also known as Runtime Interpreter
- JVM widely helps in the abstraction of the inner implementation for the programmers who utilities the libraries to develop their programs from JDK.

2.1 CLASS

- class is like a blueprint or a template for creating objects in java. It defines the state or behavior of the object created. class can have any number of variables, and methods of various types to access to different values.,
- Each class has a constructor, it can be of type default or parameterized. These constructors are used to initialize objects, with default values. class can also inherit characteristics from other class.
- While defining a class, we can declare its exact form and nature, by specifies the data that it contains and the code which operates on the data.
- The class is declared by use of the class keyword. The general form of a class definition is as follows: Class className { type instance-variable 1; type instance-variable 2;

//…

type instance-variable N; type

method name 1(parameter-list) {

//body of method

}

type method name 2(parameter-list) {

//body of method

}

type method name 3(parameter-list) {

//body of method

}

}

•A class declaration can include these in order:

Access Modifier -> Class name -> Superclass -> Interface -> Body

There are various types of classes such as:

- Nested class

- Anonymous class
- Lambda expressions **Syntax:** class ClassName

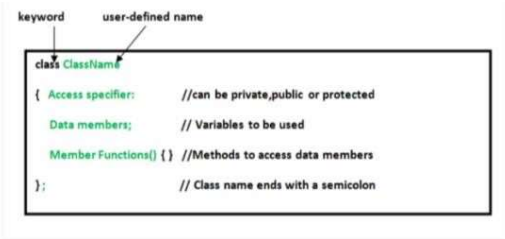

Fig 2.1.1

- The data,or variables,defined wothin a class are called instance variables.The code contained within methods.Collectively the methods and variableddefined within a class are called members of the class. In most classes,the instance variables are acted upon and accessed by the methods defined for that class.thus the methods determine how a class data can be used.
- Putting the number elements and methods into together in the definition of a class is called encapsulation.

2.2 OBJECT

- The object is a self-contained entity that has a state, behavior and identity.
- Examples: A dog has different states colors, names, breeds as well as behaviors.
- Object allocates memory for the template class. It defines the behavior of the class. It is a specimen or instance, of class used to invoke or execute any of the methods or features of the class for which object is created.
- An object contains physical as well as logical entity whereas a class does not. Memory or storage allocation takes place for a class when object is created. The methods and the variables of a class are accessed using objects.
- Objects of a class has a two steps process:
  - The First, must be declare a variable of the class types
  - Second. must acquire an actual, physical copy of the object and assign it to the variable, using the new operator.

Syntax:

Classname objectname;

Classname reference_variable=new Classname();

2.2.1 Method Overriding

- It is a method in a subclass has the same name and type signature as a method in its superclass then the method in the subclass is said to be override method in the superclass.
- Method overriding occurs when the names and also the type signatures of the two methods which are identical. Then the two methods are simply overloaded.
- So, to access the super class version of an overridden method can be called using Super.

2.2.2 Declaring Objects

- When a class is created, we are creating a new data types.
- This type is also used to declare objects of that type.
- However, obtaining the objects of a class is a two-step process,
- In First case, we must declare a variable of the class type. This variable does not define any object. Instead of it is simply a variable that can refer to an object.
- In Second case, we must acquire an actual, physical copy of the object and assign it to that variable by using the new operator.
- The new operator is dynamically allocates memory for an object and returns a to it.

2.2.3 CONSTRUCTOR:

- Constructor in java is a specified type of method which is used to initialize the object. The java constructor is invoked at the time of object creation. So, automatic initialization is performed through the use of a constructor.
- It constructs the value i.e provides data for the thing that's why it is referred to as Constructor
- There are two rules defined to the constructor:
  - Constructor name must be same as its class name
  - Constructor must have no explicit return type

•There are two types of Constructors:

- Default constructor (no-arg constructor)
- Parameterized constructor: It accepts a certain parameter which is called Parameterized constructor.
- Garbage Collection: It occurs only sporadically during the execution of programs. The objects are dynamically allocated by using the new operator, how such objects are destroyed and their memory released for later reallocation.

2.3 INHERITANCE

Inheritance is an oops concept in java that permits us to define a category from an existing class. The keyword 'extends' is employed for inheritance.

• Superclass: The parent/base class from which attributes, methods are inherited.

• Subclass: The child/derived class which inherits attributes, methods.

1.SINGLE INHERITANCE

Single inheritance is when a category inherits properties from one class only. All the attributes except private members are inherited or extended by child class from parent class.

```
class A
{
}
```

```
class B extends A
{
}
```

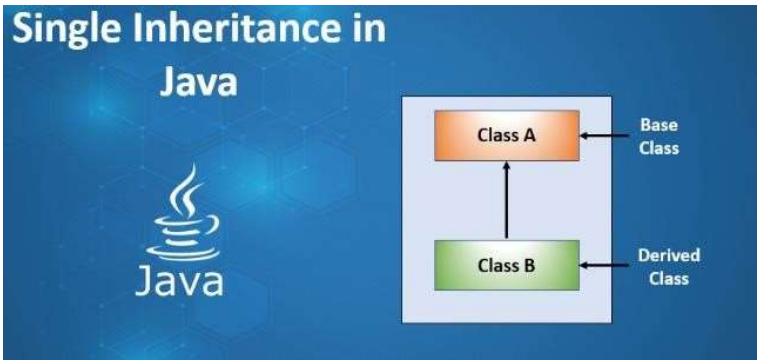

Fig 2.3.1

2.MULTILEVEL INHERITANCE

Multilevel inheritance is when a category inherits properties from derived class. This derived class becomes the parent for the new child class. It allows accessing of grandparent class attributes by the kid class also.

```
class A
{
}
class B extends A
{
}
class C extends B
{
}
```

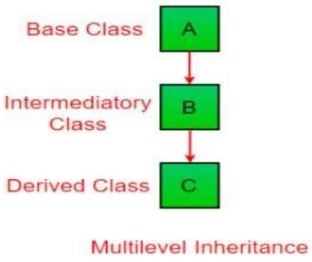

Fig 2.3.2

3.HIERARCHICAL INHERITANCE

Hierarchical inheritance is when a category is inherited two or more classes. during this sort of inheritance all of the super class's sub classes inherit same attributes of the parent class.

```
class A
{
}
class B extends A
{
}
class C extends A
{
}
```

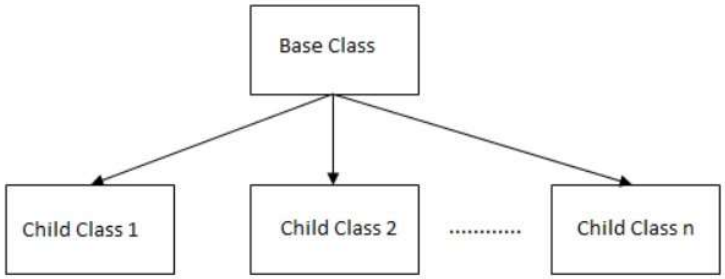

Fig 2.3.3

2.4 POLYMORPHISM

Polymorphism may be a vital concept in object-oriented programming. It means an equivalent object, method or operator acts differently in several cases.

Types of polymorphism are:

- Run-time polymorphism
- Compile-time polymorphism

Run-time polymorphism is completed using method overriding.

Method Overriding: It means different methods have same syntax and return type.

```
class A{ } class B
extends A{ public
void display(){
System.out.println(“Method1”);
}}
class C extends A{ public
void display(){
System.out.println(“Method2”);
}}
```

Compile-time polymorphism is completed through method overloading and operator overloading.

Method Overloading: It means different methods with same name differ in number, type or sequence of arguments passed in them.

```
class A{ public void
display(int a){
System.out.println(a);
}}
class B{ public void
display(String s){
System.out.println(s);
}}
```

class C{ public void display(int

x, int y){

System.out.println(x+" "+y);

}}

Operator overloading: '+' operator is employed for concatenation also as addition operator.

System.out.println(m+"ways");

System.out.println(a+b);

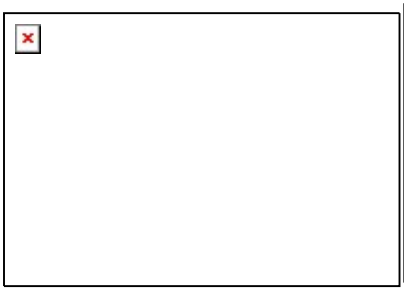

Fig 2.4.1Fig 2.4.2

2.5 ABSTRACT CLASS

An abstract class may be a template definition of methods and variables of a category which may be a category of objects that contains one or more abstracted methods. Abstract classes are utilized in all OOP languages. Objects or classes maybe abstracted, which suggests that they're summarized into characteristics that are relevant to the present program's operation.

Individual instances that are resulting from classes are objects. Declaring a category as abstract means it cannot be directly instantiated, which suggests that an object cannot be created from it. That protects the code from getting used incorrectly. Abstract classes which subclasses are to be further define as attributes are necessary for individual.

Abstract classes similar with main classes, which are the default type. A concrete class has no abstracted methods and should be instantiated and utilized in code.

Syntax:

Class abstract classname {…}

Points to Remember:

- An abstract class should be announced with an abstract keyword.
- It have only abstract methods and also non-abstract methods.
- It can't be instantiated.
- It can have constructors as well as static methods also.
- It can have final methods which may force the subclass to not change the body of the tactic.

2.6 MULTITHREADING

Multithreading in java could also be a process of executing multiple threads. A thread may be a lightweight sub-process which is that the smallest unit of processing. Multiprocessing as well as multithreading, both are used to perform multitasking. However, we use multithreading than multitasking than multiprocessing because threads use a shared memory. They won't allocate separate memory spaces to saves memory, and switching between the threads which takes less time to process. Java Multithreading is typically utilized in games, animation, etc.

Multitasking could also be a process of executing multiple tasks simultaneously. We use Multitasking to utilize the CPU. Multitasking is often achieved in two ways:

Process-based Multitasking (Multiprocessing)

Thread-based Multitasking (Multithreading)

1) Process-based Multitasking (Multiprocessing)

- Each process has an address in memory. Process based multitasking allocates a separate memory areas.
- A process is heavyweight.
- Cost of communication between the tactics is high.
- Switching from one process to a different requires a while for saving and loading register, memory maps, updating lists, etc. 2) Thread-based Multitasking (Multithreading)
- Threads share an equivalent address space.
- A thread is lightweight.
- Cost of communication between the thread Is slow

2.7 I/O FUNCTIONS IN JAVA

I/O functions in java are wont to process the input and provide output. It uses concept of Streams to operations fast. We will also perform file handling in java using these streams.

- System. Out
- System.in
- System. Err
- Output Stream
- Input Stream Example:

```
Scanner s=new Scanner(System.in);

System.out.println(“Hello”);

System.err(0);
```

Fig 2.7

2.8 PACKAGES IN JAVA

Packages in java are to encapsulate a gaggle of class's sub-packages and interfaces. It prevents naming conflicts and also provides controlled access and is referred to as data encapsulation**.**

- Packages are containers for classes that are used the category name.
- Through the utilization of the interface keyword; Java allows to completely abstract the interface from its implementation.
- By using interface, we will specify the set of methods which will be implemented by one or more class.
- In interface itself, doesn't actually define any implementation.
- A class can implement quite one interface.,
- Java provides a partitioning the category name space into more manageable chunks. This mechanism is named a package.
- In package are both a naming and a visibility control mechanism.
- It is feasible to define classes inside a package that aren't accessible by code outside those packages.

2.8.1 Defining Package

- To create a package simply include a package command is that the first statement during a Java source file.
- Any classes declared within that file is belong to the required package.
- Package statement defines name space during which classes are stored.

- If we skip the package statement the category names are put into the default package, which has no name.
- The general sort of the package statement is as follows package pkg;
- During this pkg is that the name of the package.
- For instance we will consider the subsequent statement creates a package called My Package.

2.9 Exception handling

- It allows us to handle the runtime errors caused by exceptions.
- An exception is a not normal, It occurs during the execution of a program like compile time that includes the flow of instructions.
- Languages that do not support exception handling, errors must be checked and handled manually—typically through the use of error codes [system generated error codes from 0 to 499].
- This approach is as cumbersome as it is troublesome.
- Java's exception handling avoids these problems and, brings semantic error management into the object- oriented world. All exception handling types are subclasses of the built-in class which is called Throw able.

2.9.1 Exception Types:

- Throw able is at the highest of the exception class hierarchy.
- In the below Throw able they are two subclasses which takes partition exceptions into two different branches.
- One branch is headed by Exception.
- This class is employed for exceptional conditions that user programs should catch.
- This is also the category that you simply will subclass to make your own custom exception types.
- There is a crucial subclass of Exception, called Runtime Exception. Exceptions of this sort are automatically defined for the programs that you simply write and include things like division by zero and invalid array indexing.

- The other branch is topped by Error.
- These are not expected to be caught under normal circumstances by your program, are typically created in response to catastrophic failures that cannot usually be handled by your program.
- Exceptions of type Error are employed by the Java run-time system to point errors having to try to with the run-time environment, itself.
- Stack overflow is an example of such a mistake.

2.9.2 Exception-Handling in Java five keywords

I. try

Program statements that you simply want to watch for exceptions are contained within a try block.

If an exception occurs within the try block, it is thrown.[an object representing that exception is created and thrown in the method that caused it] **II.catch**

The code which going to can catch this exception (using catch) and handle it in some rational manner.

It generated exceptions which are automatically thrown by the Java run-time application.

III. throw

For manually throw an exception, we use the keyword called as throw.

IV. throws

Any exception that's thrown out of a way must be specified intrinsically by a throws clause.

V. finally

Any code that absolutely must be executed after a try block completes, is put during a finally block.

CHAPTER 3 DESIGN

3.1ALGORITHM

An algorithm is a step-by-step instructions or procedures for solving the problem. Algorithm forms the basic foundation of writing a program as well as to understand the program.

Step 1: start

Step 2: It displays “NHCE LIBRARY”.

Step3: Choose the option you want to perform Do

you want to know the details of library?

Step 4: Enter the number which the library information required for you

1. Books information
2. Borrowers information
3. Issues and Returns
4. Exit

Step 5: If you want to know the information about books.

1. It asks to create
2. It asks to search
3. It asks to record
4. It asks to display

Step 6: If you want to display the details about borrowers.

1. It asks the id no
2. It asks the name
3. It asks the address

Step 7: If you select information about issues and returns it will display all the details regarding the borrowers in the library

Step 8: exit

3.2 DESIGN GOALS

1. Management of Books Information

1		Management of Books information	
	1.1	To create catalogue	Here we are going to create books information with details like book number, book title, and book author. Here each and every record must be entered manually through keyboard, wherever it asks the user to save how many records he need to enter. Once entering those records through correct format those details that user gives can be saved
	1.2	To update catalogue	In this module we will be able to **update** the main details of books through the records that are present in the form of book number, book title, and book author. Here we will search those details either through book number. If any additional details have to be added we will update those details in place of previous details.
	1.3	To search catalogue	In this module we are going to be able to **search**the details of books which are present in files, where details will be in the form of book number, book title, and book author. Here we will search those details either through book number. Here in this module the formatter file takes control of all the things of searching the complete details of books present in file.
	1.4	To generate reports	Here in generating reports we are going to be able to display all the details of records of books with details in the form of files.
2		Management of Borrowers information	
	2.1	To create Borrowers file	Here we are going to be **creating borrowers information with the main details of regno, name and address of borrowers. Here** each and every record must be entered manually through keyboard, wherever it asks the user to save how many records he need to enter. After entering those records through proper format those details will be saved in the file.

	2.2	To update borrowers information	In this module we will be able to **update** the details of borrower through the records that are present in the form of regNo, name, and address. Here we will search those details through regNo. If any additional details we have to add. We can update those details in place of previous details.
	2.3	To search borrowers information file	In this module we will be able to **search** the details of borrower information which are present in files, where we can search those details either through regNo or through there id no. Here during this module formatter file takes management of all the things by searching the complete details of borrowers.
	2.4	To generate reports	Here in generating reports we are going to be able to display all the details of records of borrowers with details in the form of files.
3		Management of Book issues and returns	
	3.1	To issue Books	In this module we will Read the student id from keyboard and match the id with the borrower's information then store in issue file. Read book number from keyboard and match it with books record file then store in issue file because it is issued in the above reg number. Enter issued book date and return date to save in issued file.
	3.2	To search issues file	Here in this module we need to maintain we must always be able to search in issue and return file by book number.
	3.3	To generate reports	Here in generating reports we are going to be able to display all the details of records of borrowers with details within the form of files.
4		Main Module	
	4.1	To display System Banner	After all modules we have a tendency to integrated through files we display System Banner as LIBRARY INFORMATION MANAGEMENT SYSTEM.
	4.2	To process menu	Here **Process Menu** may be done through switch case statement with all the modules that are present in the file

	4.3	Initializations	Here **Initializations** may be done through methods, variables as well as objects which are present in class.
	4.4	To provide Security	To provide **Security** we need to add the user name and password with login credentials wherever user can able to access his details with valid login credentials so he may be able to create files, search a file and show record of that file, wherever as in admin module the admin additionally must access his entire details with username and password where he can be able to modify all files that are present in user module.

CHAPTER 4

IMPLEMENTATION

4.1 IMPLEMENTATION OF EXCEPTION HANDLING

Step 1:in Java try, catch, throw, throws and finally are the five keywords for exception handling. In this project try and catch are the two keywords implemented for the exception handling.

Step 2: code is enclosed within the try block. Try block is followed by the catch clauses which specifies the exception type catch.

Step 3: once the exception occurs in try block, then the cursor comes out of the try block and executes the catch statement.

Step 4: after the execution of catch statement, the program control continues with the next line in the program.

1. This program starts with switch case that includes.

->User mode

->Exit

2. User mode:

After choosing this mode few options are displayed like

1. Books information
2. Borrowers information
3. Issues and returns
4. Exit

4.2 IMPLEMENTATION OF I/O OPERATIONS

Step 1: create object for FileInputStream and FileOutputStream. Where FileInputStream and FileOutputStream are the classes used to read and write the files in Java.

Step 2:pass the filename as argument in which you have to perform read or write operation.

Step 3: read(), readline are the methods used to read the data from console whereas print(), println() are the methods used to output the data to console.

Step 4: In this program, throws IO exception was implemented to throw the exception.

Step 5: file should be closed when you are done with read and write operations

Step 6:"close()" method is used to close the file.

1. Books information:

In this function we can find about books information. To know the all details, we have choose some options like which information you want to know is to create, search , display, record and then to end the file

2. Borrowers information:

In this function we can find about borrowers information. To know the all details, we have choose some options like which information you want to know is to create, search , display, record and then to end the file

3. Issues and returns:

This function is used to show the issues and returns of a books , To know the all details, we have choose some options like which information you want to know is to issue, return, search in issues, display in issues and then to end the file.

4. Exit:

After the user is done to know the information about library. We can choose the exit option to come out of the page.

4.3 IMPLEMENTATION OF OBJECT

Step 1: declare a variable of the class type that can refer to an object.

Step 2: create an object by using the "new" keyword

Step 3: "new" keyword should be followed by the call of the constructor. This call initializes the new object.

Step 4: after the creation of object, we can call a class method by obj_var_name.method_name(); Example: x.display();

CHAPTER 5

RESULTS

```
C:\Users\Rohini\Desktop>javac LibraryInformationTechnology.java

C:\Users\Rohini\Desktop>java LibraryInformationTechnology
******NHCE Library********
username
137220
password
137220

MENU

1.Books Information
2.Borrowers Information
3.Issues And Returns
4.exit

enter users option
```

Fig 5.1

Initially the user has to enter the username and password and later the menu will be displayed.

```
C:\Users\Rohini\Desktop>javac LibraryInformationTechnology.java

C:\Users\Rohini\Desktop>java LibraryInformationTechnology
******NHCE Library********
username
137220
password
137220

MENU

1.Books Information
2.Borrowers Information
3.Issues And Returns
4.exit

enter users option
1
****BOOKS INFORMATION SYSTEM****

MENU

1.create
2.update
3.search
4.records
5.exit

enter users choice
```

Fig 5.2

In main menu, If the user enters the option 1 that is books information then again user has to enter the option whether they want to create, update, search, record and exit

```
MENU

1.Books Information
2.Borrowers Information
3.Issues And Returns
4.exit

enter users option
1
****BOOKS INFORMATION SYSTEM****

MENU

1.create
2.update
3.search
4.records
5.exit

enter users choice
1
how many records
1
enter book number
111
enter book title
aaa
enter author name
sss

MENU

1.create
2.update
3.search
4.records
5.exit

enter users choice
```

Fig 5.2a

In books information systems, if user enters the choice 1 to create the book then the user has to enter the book informations such as book number, book title and author name.

```
enter users choice
1
how many records
1
enter book number
111
enter book title
aaa
enter author name
sss

MENU

1.create
2.update
3.search
4.records
5.exit

enter users choice
2
enter then no of records
1
enter book number
222
enter book title
ddd
enter author name
fff

MENU

1.create
2.update
3.search
4.records
5.exit

enter users choice
```

Fig 5.2b

In books information system, if user enters choice 2 to update then same as Choice 1 they have to insert the details of the book.

Fig 5.2c

In books information system, if user enters choice 3 to search the book then the user has to enter the book number. If book is found then it displays the details of the book.

Fig 5.2d

In books information system, if the user enters the choice 4 records then it displays all records of the books along with the details.

Fig 5.2e

In books information system, if user enters choice 5 then it exits from the book information system and enters to the borrowers information.

Fig 5.3,5.3a

In borrower's information, the user has 5 options they can create, update, search, record and exit. If user enters the choice 1 to create then they have to enter the details such as id number, name and address of the borrower.

Fig 5.3b

In borrower information, if user enters the choice 2 to update then same as Choice 1 they have to enter their details such as id number, name and address.

Fig 5.3c

In borrower information, if user enters the choice 3 to search the detail of the borrower then they have to enter the id number. If id number is found then the details will be displayed.

Fig 5.3d

In borrower information, if user enters the choice 4 then it displays all the records of the borrowers along with their details.

Fig 5.3e

In borrower information, if user enters the choice 5 then it exits from borrower information and enters into issues and returns.

Fig 5.4

In issues and returns, if user enters choice 1 issues then user has to enter the id number and book number.

Fig 5.4b

In issues and returns, if user enters choice 2issues then the user has to enter the id number if the id number is present it will end the file.

```
***ISSUES AND RETURNS***

MENU

1.ISSUES
2.SEARCH IN ISSUE FILE
3.DISPLAY ISSUE FILE
4.EXIT

enter choice
3
regno:122
book no:356
issu date:29/04/2020
return date:13/05/2020


END OF FILE
***ISSUES AND RETURNS***

MENU

1.ISSUES
2.SEARCH IN ISSUE FILE
3.DISPLAY ISSUE FILE
4.EXIT

enter choice
```

fig 5.4c

In issues and returns, if user enters choice 3 then it display all issue files Along with the DetailS.

```
END OF FILE
***1.ISSUES AND RETURNS***

MENU

1.ISSUES
2.SEARCH IN ISSUE FILE
3.DISPLAY ISSUE FILE
4.EXIT

enter choice
4

MENU

1.Books Information
2.Borrowers Information
3.Issues And Returns
4.exit

enter users option
```

Fig 5.4d

In issues and returns, if user enters the choice 4 then it exits from issues and returns and Enters to the main menu

Fig 5.5

In main menu, if user enters the choice 4 then the user can exit.

CHAPTER 6

CONCLUSION

This project mainly deals with the library information system which is implemented by the object-oriented concepts in Java. It has its own merits and demerits. The main advantage of implementing the library information system is to reach the students satisfaction. Thus library information system generates new book opportunities for students. Therefore the project has been designed to provide the user with proper convenient whether the books are issued and returned on time or not.

REFERENCE

[1] Kishori Sharan. "Beginning Java 9 Fundamentals", Springer Science and Business Media LLC, 2017 [2] "SCJP Exam for J2SE 5", Springer Science and Business Media LLC, 2006

[3] Quentin Charatan, Aaron Kans. "Java in Two Semesters", Springer Science and Business Media LLC, 2019

[4] Vaskaran Sarcar. "Interactive Object-Oriented Programming in Java", Springer Science and Business Media LLC, 2020 [5] Beginning Java 8 Fundamentals, 2014. [6] José M. Garrido. "Object Oriented Simulation", Springer Science and Business Media LLC

[7] Kevin Lano, José Luiz Fiadeiro, Luís Andrade. "Software Design Using Java 2", Springer Science and Business Media LLC, 2002

[8] Jiaqin Yang. "Recent trends and developments in e-banking in an underdeveloped nation – an empirical study", International Journal of Electronic Finance, 2009 [9] Nair, .

"Simple Data Structures", Java Programming Fundamentals Problem Solving Through Object Oriented Analysis and Design, 2008.