LIVE TO LEARN & LEARN TO SHARE

MRCET CAMPUS

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS INSTITUTION - UGC, GOVT. OF INDIA)

Affiliated to JNTUH; Approved by AICTE, NBA-Tier 1 & NAAC with A-GRADE | ISO 9001:2015

Maisammaguda, Dhulapally, Komaplly, Secunderabad - 500100, Telangana State, India

LABORATORY MANUAL & RECORD

Name:.....

Roll No:.....Branch:.....

Year:.....Sem:.....

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS INSTITUTION - UGC, GOVT. OF INDIA)

Affiliated to JNTUH; Approved by AICTE, NBA-Tier 1 & NAAC with A-GRADE | ISO 9001:2015

Maisammaguda, Dhulapally, Komaplly, Secunderabad - 500100, Telangana State, India

Certificate

Certified that this is the Bonafide Record of the Work Done by

Mr./Ms.....Roll.No.....of

B.Tech.....year..... Semester for Academic year.....

in.....Laboratory.

Date: Faculty Incharge HOD

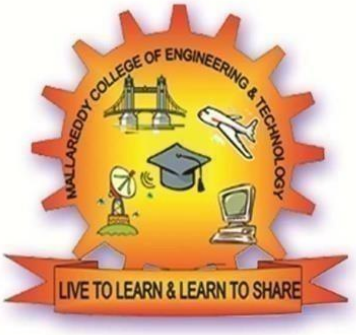
Internal Examiner External Examiner

INDEX

S.No	Date	Name of the Activity/Experiment	Grade/ Marks	Faculty Signature

SOFTWARE ENGINEERING LAB MANUAL
(R24A0585)

B.TECH



(II YEAR – I SEM)
(2025-26)

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(Artificial Intelligence & Machine Learning)

MALLAREDDYCOLLEGEOFENGINEERING&TECHNOLOGY
(AutonomousInstitution–UGC,Govt.ofIndia)

Recognizedunder 2(f)and12(B)ofUGCACT1956
(AffiliatedtoJNTUH,Hyderabad,ApprovedbyAICTE-AccreditedbyNBA&NAAC–'A'Grade-ISO9001:2015Certified)
Maisammaguda, Dhulapally(PostVia.Hakimpet),Secunderabad–500100,TelanganaState,India

Department of Computer Science and Engineering

(Artificial Intelligence & Machine Learning)

Vision

To be a premier center for academic excellence and research through innovative interdisciplinary collaborations and making significant contributions to the community, organizations, and society as a whole.

.

Mission

- To impart cutting-edge Artificial Intelligence technology in accordance with industry norms.
- To instil in students a desire to conduct research in order to tackle challenging technical problems for industry by sustaining the ethical values.
- To develop effective graduates who are responsible for their professional growth, leadership qualities and are committed to lifelong learning.

Quality Policy

To provide sophisticated technical infrastructure and to inspire students to reach their full potential.

To provide students with a solid academic and research environment for a comprehensive learning experience.

To provide research development, consulting, testing, and customized training to satisfy specific industrial demands, thereby encouraging self-employment and entrepreneurship among students.

Programme Educational Objectives (PEO):

Graduates of the program will be able to

PEO1: Build successful careers in AI & ML and related fields by applying fundamental concepts of computer science, maths and specialized knowledge of intelligent systems.

PEO2: Design and implement AI-based solutions to real-world problems, demonstrating creativity, critical thinking.

PEO3: Leverage the professional expertise to enter the workforce, seek higher education, and conduct research on AI-based problem resolution.

PEO4: Uphold ethical values and consider societal, legal, and environmental consequences while developing intelligent systems, safeguarding responsible AI development.

Programme Specific Outcomes (PSO):

After successful completion of the program a student is expected to have specific abilities to:

PSO1: Analyze and examine the fundamental issues with AI and ML applications.

PSO2: Apply machine learning, deep learning, and artificial intelligence approaches to address issues in social computing, healthcare, computer vision, language processing, speech recognition, and other domains.

PSO3: Use cutting-edge AI and ML tools and technology to further your study and research.

PROGRAM OUTCOMES (POs)

PO1: Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.

PO2: Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)

PO3: Design/Development of Solutions: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)

PO4: Conduct Investigations of Complex Problems: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8).

PO5: Engineering Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6)

PO6: The Engineer and The World: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).

PO7: Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)

PO8: Individual and Collaborative Team work: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.

PO9: Communication: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences

PO10: Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.

PO11: Life-Long Learning: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)

KNOWLEDGE AND ATTITUDE PROFILE (WK)

WK1: A systematic, theory-based understanding of the natural sciences applicable to the discipline and awareness of relevant social sciences.

WK2: Conceptually-based mathematics, numerical analysis, data analysis, statistics and formal aspects of computer and information science to support detailed analysis and modelling applicable to the discipline.

WK3: A systematic, theory-based formulation of engineering fundamentals required in the engineering discipline.

WK4: Engineering specialist knowledge that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline.

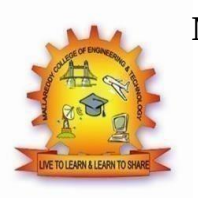
WK5: Knowledge, including efficient resource use, environmental impacts, whole-life cost, reuse of resources, net zero carbon, and similar concepts, that supports engineering design and operations in a practice area.

WK6: Knowledge of engineering practice (technology) in the practice areas in the engineering discipline.

WK7: Knowledge of the role of engineering in society and identified issues in engineering practice in the discipline, such as the professional responsibility of an engineer to public safety and sustainable development.

WK8: Engagement with selected knowledge in the current research literature of the discipline, awareness of the power of critical thinking and creative approaches to evaluate emerging issues.

WK9: Ethics, inclusive behaviour and conduct. Knowledge of professional ethics, responsibilities, and norms of engineering practice. Awareness of the need for diversity by reason of ethnicity, gender, age, physical ability etc. with mutual understanding and respect, and of inclusive attitudes.



MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
Maisammaguda, Dhulapally Post, Via Hakimpet, Secunderabad – 500100
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(Artificial Intelligence & Machine Learning)

GENERAL LABORATORY INSTRUCTIONS

1. Students are advised to come to the laboratory at least 5 minutes before (to starting time), those who come after 5 minutes will not be allowed into the lab.
2. Plan your task properly much before to the commencement, come prepared to the lab with the synopsis / program / experiment details.
3. Student should enter into the laboratory with:

a. Laboratory observation notes with all the details (Problem statement, Aim, Algorithm, Procedure, Program, Expected Output, etc.,) filled in for the lab session.

b. Laboratory Record updated up to the last session experiments and other utensils (if any) needed in the lab.

c. Proper Dress code and Identity card.

4. Sign in the laboratory login register, write the TIME-IN, and occupy the computer system allotted to you by the faculty.
5. Execute your task in the laboratory, and record the results / output in the lab observation notebook, and get certified by the concerned faculty.
6. All the students should be polite and cooperative with the laboratory staff, must maintain the discipline and decency in the laboratory.
7. Computer labs are established with sophisticated and high-end branded systems, which should be utilized properly.
8. Students / Faculty must keep their mobile phones in SWITCHED OFF mode during the lab sessions. Misuse of the equipment, misbehavior with the staff and systems etc., will attract severe punishment.
9. Students must take the permission of the faculty in case of any urgency to go out; if anybody found loitering outside the lab / class without permission during working hours will be treated seriously and punished appropriately.
10. Students should LOG OFF/ SHUT DOWN the computer system before he/she leaves the lab after completing the task (experiment) in all aspects. He/she must ensure the system / seat is kept properly.

Head of the Department **Principal**

Lab Objectives:

- To prepare students to become familiar with the Standard Java technologies ofJ2SE
- To prepare students to excel in Object Oriented programming and to succeed as a Java Developer through global rigorous education.
- To provide Students with a solid foundation in OOP fundamentals required to solve programming problems and also to learn Advanced Java topics like J2ME, J2EE,JSP,JavaScript
- To train Students with good OOP programming breadth so as to comprehend, analyze, design and create novel products and solutions for their al life problems.
- To inculcate in students professional and ethical attitude, multi disciplinary approach and an ability to relate java programming issues to broader application context.
- To provide student with an academic environment aware of excellence, writ ten ethical codes and guidelines and life long learning needed for a successful professional career.

Lab Out comes:

Upon successful completion of this course, the students will be able to:

- Able to analyze the necessity for Object Oriented Programming paradigm and over structured programming and become familiar with the fund a mental concepts in OOP.
- Demonstrate an ability to design and develop java programs, analyze, and interpret object-oriented data and report results.
- Demonstrate an ability to design an object-oriented system ,AWT components or multi threaded process as per needs and specifications.
- Demonstrate an ability to visualize and work on laboratory and multi disciplinary tasks like console and windows applications both for stand lone and Applets programs

Introduction about lab

System configurations are as follows:

- **Hardware/Software's installed: I**ntel®CORE™i3-3240CPU@3.40GHZRAM:4GB/C,C++Compiler,JAVAJDK1.8,EditPlus.
- Systemsareprovidedforstudentsinthe**1:1ratio.**
- Systemsareassignednumbersandsamesystemisallottedforstudentswhentheydothelab.
- All Systems are configured in LINUX, it is open source and students can use any different programming environments through package installation.

Guidelines to students

A. Standard operating procedure

a) Explanationontoday'sexperimentbytheconcernedfacultyusingPPTcoveringthefollowingaspects:

1) Name of the experiment
2) Aim
3) Software/Hard ware requirements
4) Writing the java programs by the students
5) Commands for executing programs

Writing of the experiment in the Observation Book

The students will write the today's experiment in the Observation book as per the following format:

a) Name of the experiment
b) Aim
c) Writing the program
d) Viva-Voce Questions and Answers
e) Errors observed(if any)during compilation/execution

B. Guide Lines to Students in Lab

Disciplinary to be maintained by the students in the Lab

- Studentsarerequiredtocarrytheirlabobservationbookandrecordbookwithcompletedexperimentswhile enteringthelab.
- Studentsmustusetheequipmentwithcare.Anydamageiscausedstudentispunishable.
- Students are not allowed to use their cell phones/pen drives/CDs in labs.
- Students need to be maintain proper dress code along with ID Card
- Students are supposed to occupy the computers allotted to them and are not supposed to talk or make noise in the lab.

- Students, after completion of each experiment they need to be updated in observation notes and same to be updated in the record.
- Lab records need to be submitted after completion of experiment and get it corrected with the concerned lab faculty.
- If a student is absent for any lab, they need to be completed the same experiment in the free time before attending next lab.

Steps to perform experiments in the lab by the student

Step1: Students have to write the date,aim and for that experiment in the observation book.

Step2: Students have to listen and understand the experiment explained by the faculty and note down the important points in the observation book.

Step3: Students need to write procedure/algorithm in the observation book.

Step4: Analyze and Develop/implement the logic of the program by the student in respective platform

Step5: After approval of logic of the experiment by the faculty then the experiment has to be executed on the system.

Step6: After successful execution the results are to be shown to the faculty and noted the same in the observation book.

Step7: Students need to attend theViva-Voce on that experiment and write the same in the observation book.

Step8: Update the completed experiment in the record and submit to the concerned faculty in-charge.

Instructions to maintain the record

- Before start of the first lab they have to buy the record and bring the record to the lab.
- Regularly (Weekly) update the record after completion of the experiment and get it corrected with concerned lab in-charge for continuous evaluation. In case the record is lost inform the same day to the faculty in charge and get the new record within 2 days the record has to be submitted and get it corrected by the faculty.
- If record is not submitted in time or record is not written properly, the evaluation marks (5M)will be deducted.

Awarding the marks for day to day evaluation

Total marks for day to day evaluation is 15 Marks as per Autonomous (JNTUH).

These 15 Marks are distributed as:

Regularity	3Marks
Program written	3Marks
Execution & Result	3Marks
Viva-Voce	3Marks
Dress Code	3Marks

Allocation of Marks for Lab Internal

Total marks for lab internal are 40 Marks as per Autonomous

(JNTUH.) These 40 Marks are distributed as:

Average of day to day evaluation

marks:15 Marks Lab Mid exam:40

Marks

VIVA&Observation:10 Marks

Allocation of Marks for Lab External

Total marks for lab Internal and External are 60Marks as per Autonomous/ (JNTUH). These 60 External Lab Marks are distributed as:

Program Written	15Marks
Program Execution and Result	25Marks
Viva-Voce	10Marks
Record	10Marks

C. General laboratory instructions

1. Students are advised to come to the laboratory at least 5minutes before (to the starting time), those who come after 5minutes will not be allowed in to the lab.
2. Plan your task properly much before to the commencement, come prepared to the lab with the synopsis/ program/experiment details.
3. Student should enter in to the laboratory with:

a. Laboratory observation notes with all the details (Problem statement, Aim, Algorithm, Procedure, Program, Expected Output, etc.,) filled in for the lab session.

b. Laboratory Record updated up to the last session experiments and other utensils (if any) needed in the lab.

c. Proper Dress code and Identity card.

4. Sign in the laboratory login register, write the TIME-IN, and occupy the computer system allotted to you by the faculty.
5. Execute your task in the laboratory, and record the results / output in the lab observation note book, and get certified by the concerned faculty.
6. All the students should be polite and cooperative with the laboratory staff, must maintain the discipline and decency in the laboratory.
7. Computer labs are established with so phisticated and high end branded systems, which should be utilized properly.
8. Students / Faculty must keep their mobile phones in SWITCHED OFF mode during the lab sessions. Misuse of the equipment, misbehaviors with the staff and systems etc., will attracts evere punishment.
9. Students must take the permission of the faculty in case of any urgency to go out ; if any body found loitering outside the lab / class without permission during working hours will be treated seriously and punished appropriately.
10. Students should LOG OFF/ SHUT DOWN the computer system before he/she leaves the lab after completing the task (experiment) in all aspects. He/she must ensure the system / seats kept properly.

Head of the Department **Principal**

B.Tech. II Year I Sem. CSE (AIML)

L	T	P	C
0	0	2	1

(R24A0585) SOFTWARE ENGINEERING LAB

Prerequisites

- A course on "Programming for Problem Solving".

Co-requisite

- A Course on "Software Engineering".

Course Objectives:

- To have hands on experience in developing a software project by using various software engineering principles and methods in each of the phases of software development.

Course Outcomes:

- Ability to translate end-user requirements into system and software requirements
- Ability to generate a high-level design of the system from the software requirements
- Will have experience and/or awareness of testing problems and will be able to develop a simple testing report

List of Experiments

Do the following seven exercises for any two projects given in the list of sample projects or any other Projects:

1. Development of problem statements.
2. Preparation of Software Requirement Specification Document, Design Documents and Testing Phase related documents.
3. Preparation of Software Configuration Management and Risk Management related documents.
4. Study and usage of any Design phase CASE tool
5. Performing the Design by using any Design phase CASE tools.
6. Develop test cases for unit testing and integration testing
7. Develop test cases for various white box and black box testing techniques.

Sample Projects:

1. Passport automation System
2. Book Bank
3. Online Exam Registration
4. Stock Maintenance System
5. Online course reservation system
6. E-ticketing

7. Software Personnel Management System
8. Credit Card Processing

TEXT BOOKS:

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition, McGrawHill International Edition.
2. Software Engineering- Sommerville, 7th edition, Pearson Education.
3. The unified modeling language user guide Grady Booch, James Rambaugh, Ivar Jacobson,Pearson Education.

REFERENCE BOOKS:

1. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, JohnWiley.
2. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill

TABLE OF CONTENTS

WEEK 1

AIM: To develop problem statements for a library management system.

Problem Statement:

Statement of a current issue/problem that requires timely action to improve the situation.

Process Flow of Library Management System:

- A Book Bank lends books and magazines to member, who is registered in the system.
- Also it handles the purchase of new titles for the Book Bank.
- Popular titles are brought into multiple copies.
- Old books and magazines are removed when they are out or date or poor in condition.
- A member can reserve a book or magazine that is not currently available in the book bank, so that when it is returned or purchased by the book bank, that person is notified.
- The book bank can easily create, replace and delete information about the tiles, members, loans and reservations from the system.

Components:

- Problem
- Proposed Solution
- Solution(s) and its implementation steps

Roles & Responsibilities:

a) Librarian:
- Admin
- Adding & modifying books etc.
- Inventory maintenance

b) Member:
- Registered users
- Search available books
- Order & book return

c) System:
- Notifications for overdue, availability of book etc.

Inputs:

- Author Name
- Published Year
- Price
- Book ID
- User details like id, password for logging in
- Communication Details

Problems/Constraints:

- Updating difficulties on account of adding of new books regularly.
- Faster due date notification(s).
- Internet Bandwidth
- Unavailability of e-books

WEEK 2

AIM:

Preparation of Software Requirement Specification Document, Design Documents and Testing Phase Related documents.

Preparation of Software Requirement Specification Document:

Users Characteristics:

Student: They are the people who desire to obtain the books and submit the information to the database.

Librarian: He has the certain privileges to add the books and to approval of the reservation of books. System Modules:

Log in: Secure registration of student and librarian by filling online registration form.

Book bank: Book bank contains all the books. New book added to the book bank with book no, titlename, author, edition, publisher name details to the database. Any book is deleted if damaged. Update of the book information also done.

Operations: student and administrator perform their operations like add book, delete book,update information, view book details are implemented in log in Web Pages.

Non-functional requirements:

Privacy: privacy maintained for each and every user by providing user credentials username and password.

Portability: installation on multiple platforms and execution of software.

Design Document:

- Algorithm, Data Structure, Architecture and other support Information is maintained in a design document.

Diagrams:

a. Use Case:
   - System details summary & all users in the system.

b. Activity:
   - System behavior (inclusive of dynamic aspects).

c. Sequence:

- Message flow with the time stamp.

d. Class:

- System Structure (Name, Attributes, Operations).

e. State Chart:

- States specific to components/objects of a system.

f. Deployment:

- System architecture with respect to execution.

Test Plan Document:

- Test plan document contains all the catalog information of test strategies, objectives, schedule, estimations and resources required to complete the project.
- A “Test Case” refers to the actions required to verify a specific feature or functionality in software testing.

Test Case Design Template:

Test Case ID:	Description:	Test Steps:	Expected Results:	Actual Results:	Pre-Requisites:	Pass/ Fail:	Remarks:

WEEK 3

AIM:
Preparation of Software Configuration Management and Risk Management related documents for library management system.

Preparation of Software Configuration Management

 Forms basis for End User License Agreement (EULA).

 All the compatibilities of implementing the system can be known.

Software Requirements:

Operating System:

Windows 7/10 Front end :

J2EE

Back end : MySQL Server

IDE used : NetBeans

Hardware Requirements:

Processor: i3 or

higher RAM : 4

GB

Hard Disk drive: 500 GB

Risk Management:

 Relates to the factors that have negative impact on the software project.

 Categorized into

i. Known risks

ii. Unknown risks

 Known risks are the “predictable” risks that can be easily categorized.

Example: Staffing, Code errors etc.

 Unknown risks are the “unpredictable” risks that cannot be identified and categorized easily.

Example: Natural disasters, epidemic, recession etc.

RISK ASSESSMENT MATRIX TEMPLATE

RISK RATING KEY	LOW	MEDIUM	HIGH	EXTREME
	0 – ACCEPTABLE OK TO PROCEED	1 – ALARP (as low as reasonably practicable) TAKE MITIGATION EFFORTS	2 – GENERALLY UNACCEPTABLE SEEK SUPPORT	3 – INTOLERABLE PLACE EVENT ON HOLD

	SEVERITY			
	ACCEPTABLE LITTLE TO NO EFFECT ON EVENT	TOLERABLE EFFECTS ARE FELT, BUT NOT CRITICAL TO OUTCOME	UNDESIRABLE SERIOUS IMPACT TO THE COURSE OF ACTION AND OUTCOME	INTOLERABLE COULD RESULT IN DISASTER
LIKELIHOOD				
IMPROBABLE RISK IS UNLIKELY TO OCCUR	LOW – 1 –	MEDIUM – 4 –	MEDIUM – 6 –	HIGH – 10 –
POSSIBLE RISK WILL LIKELY OCCUR	LOW – 2 –	MEDIUM – 5 –	HIGH – 8 –	EXTREME – 11 –
PROBABLE RISK WILL OCCUR	MEDIUM – 3 –	HIGH – 7 –	HIGH – 9 –	EXTREME – 12 –

WEEK 4

AIM:

Study and usage of any Design phase CASE tool

Design phase CASE tool:

CASE Tool: STARUML

How to Install StarUML on Windows 10

- Star UML is a UML (**Unified Modeling Language**) tool introduced by MKLab. It is an open-source modeling tool that supports the UML framework for system and software modeling. StarUML is based on UML version 1.4, which provides 11 different types of diagrams and it accepts UML 2.0 notation. Version 2.0 was released for beta testing under a property license.

- StarUML is actively supporting the **MDA (Model Driven Architecture).** It supports the UML profile concept and allowing it to generate code for multiple languages. It also provides a number of bug fixes and improved compatibility with the modern versions of the Windows Operating System.

- StarUML is mostly used by the Agile and small development teams, professional persons and used by the educational institutes.

Features of StarUML:

1. It supports multi-platform such as Mac OS, Windows, and Linux.
2. It involves UML 2.x.standard compliant.
3. Includes Entity-Relationship Diagram (ERD), Data-Flow Diagram (DFD) and Flowchart diagrams.
4. It creates multiple windows.
5. It has modern UX and dark and light themes.
6. Featured with retina (High-DPI) display support.
7. Includes model-driven development.
8. It has open Application Programming Interface (API).

9. Supports various third-party extensions.
10. Asynchronous model validation.
11. It can export to HTML docs.

Steps to Download and Install StarUML

Step 1: Go on the browser, type in the URL

"StarUML". Step 2: Click on the very first

search "Download-StarUML".

Step 3: There will be 3 Operating Systems (OS) options, click on the option as

per the devise OS. Step 4: Now, right-click on the downloaded file, select

"Show in Folder" option.

Step 5: Click on the open file, a popup window opens, click on the "Yes" button.

Step 6: Installation gets start. After installation popup opens to ask to buy a license. If you want to click on the "Buy Now" button or else close that window. StarUML is ready to use.

Week 5

Aim:To design performance using Design phase CASE Tool.

CASE Tool:

StarUML Use Case

Diagrams:

The book bank use cases are:

1. book_issue
2. book_return
3. book_order
4. book_entry
5. search book_details

Actors Involved:

1. Student
2. Librarian
3. Vendor

I) Usecase Name: Search Book_Details

The librarian initiates this use case when any member returns or request the book and checking ifthe book is available.

Precondition: The librarian should enter all Book details.

Normal Flow: Build message for librarian who search the book.

Post Condition: Send message to respective member who reserved the book.

II) Usecase Name: Book_ Issue

Initiated by librarian when any member wants to borrow the desired book. If the book is available, the book is issued.

Precondition: Member should be valid member of library.

Normal Flow: Selected book will be issued to the member.

Alternative Flow: If book is not available then reserved book use case should be initiate. **Post Condition:** Update the catalogue.

III) Usecase Name: Book_Order

Initiated by librarian when the requested book is not available in the library at that moment. The book is reserved for the future and issued to the person when it is available.

Precondition: Initiatedonly when book is not available.

Normal Flow: It reserved the book if requested.

Post Condition: Mention the entry in catalogue for reservation.

IV) Usecase Name: Book_Return

Invoked by the librarian when a member returns the book.

Precondition: Member should be valid member of library.

Normal Flow: Librarian enters bookid and system checks for return date of the book.

AlternativeFlow: System checks for return date and if it returned late fine message will be displayed.

Post Condition: Check the status of reservation.

V) Usecase Name: Book_Entry

The purchase book use-case when new books invoke it or magazines are added to the library.

Precondition: Not available or more copies are required.

Normal Flow: Enter bookid, author information, publication information, purchased date, prize and number of copies.

Post Condition: Update the information in catalogue.

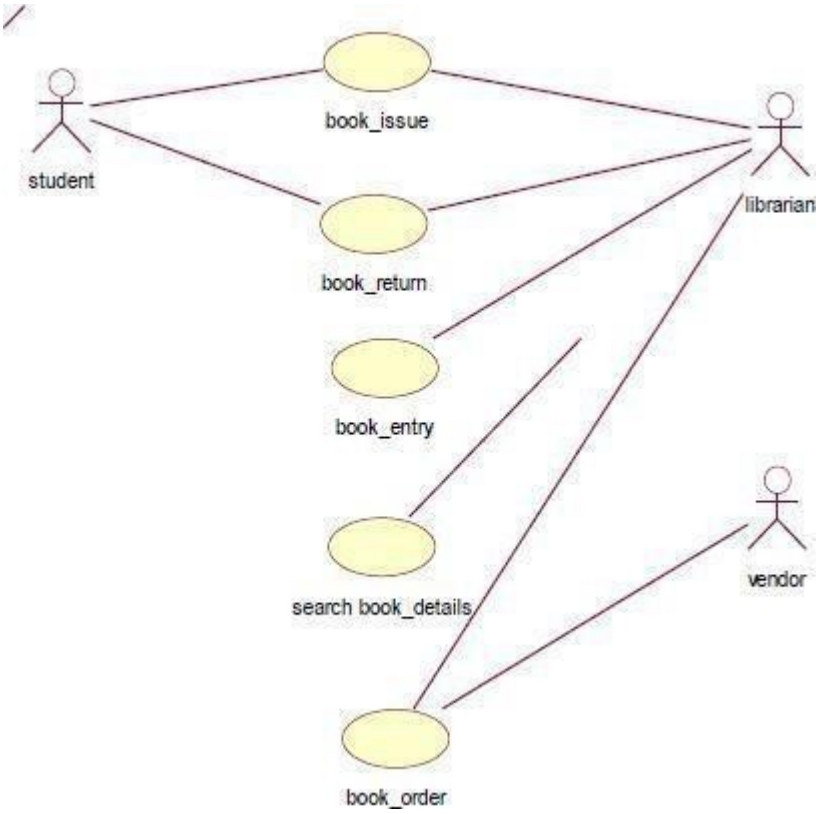


Figure 1. Use case diagram for Book Bank System

Activity Diagrams:

- They are used to describe the business and operational step-by-step workflows of components in a system.
- An activity diagram shows the overall flow of control.

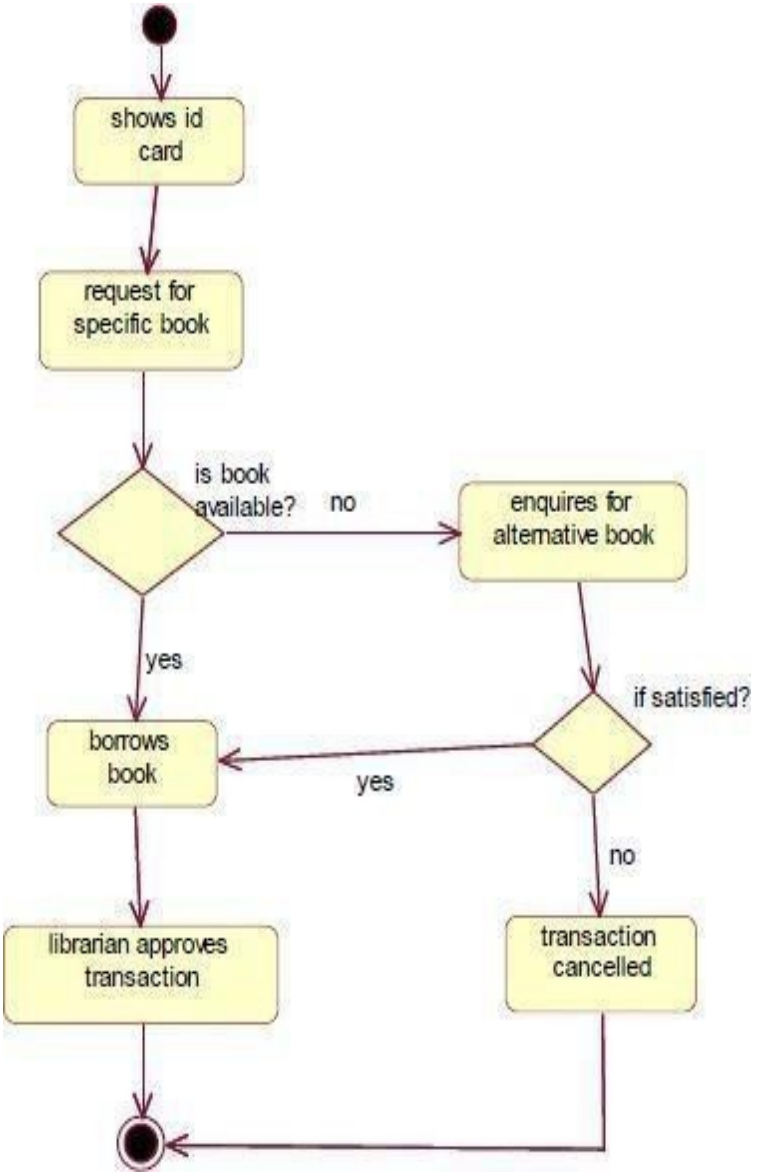


Figure 2. Activity Diagram for Book Bank System [borrow book]

- An activity is shown as a roundedbox containing the name of the operation. This activity diagram describes the behavior of the system.

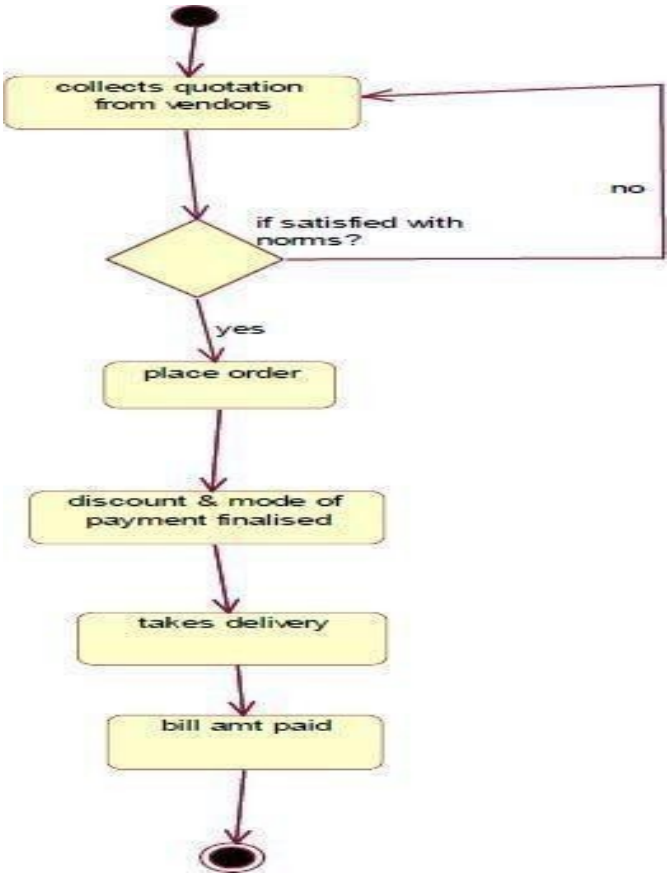


Figure 3. Activity Diagram for Book Bank System [order book]

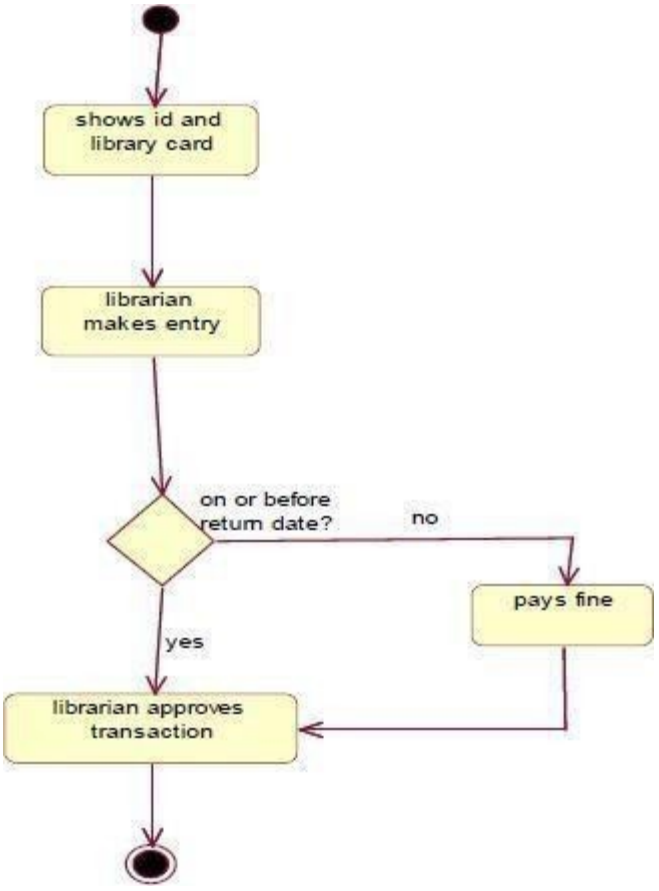


Figure 4. Activity Diagram for Book Bank System [Return book]

Sequence Diagram:

- A sequence diagram represents the sequence and interactions of a given USE-CASE or scenario. Sequence diagrams can capture most of the information about the system.

- Most object-to-object interactions and operations are considered events and events include signals, inputs, decisions, interrupts, transitions and actions to or from users or external devices.

- An event also is considered to be any action by an object that sends information. The event line represents a message sent from one object to another, in which the “form” object is requesting an operation be performed by the “to” object.

- The “to” object performs the operation using a method that the class contains. It is also represented by the order in which things occur and how the objects in the system sendmessage to one another.

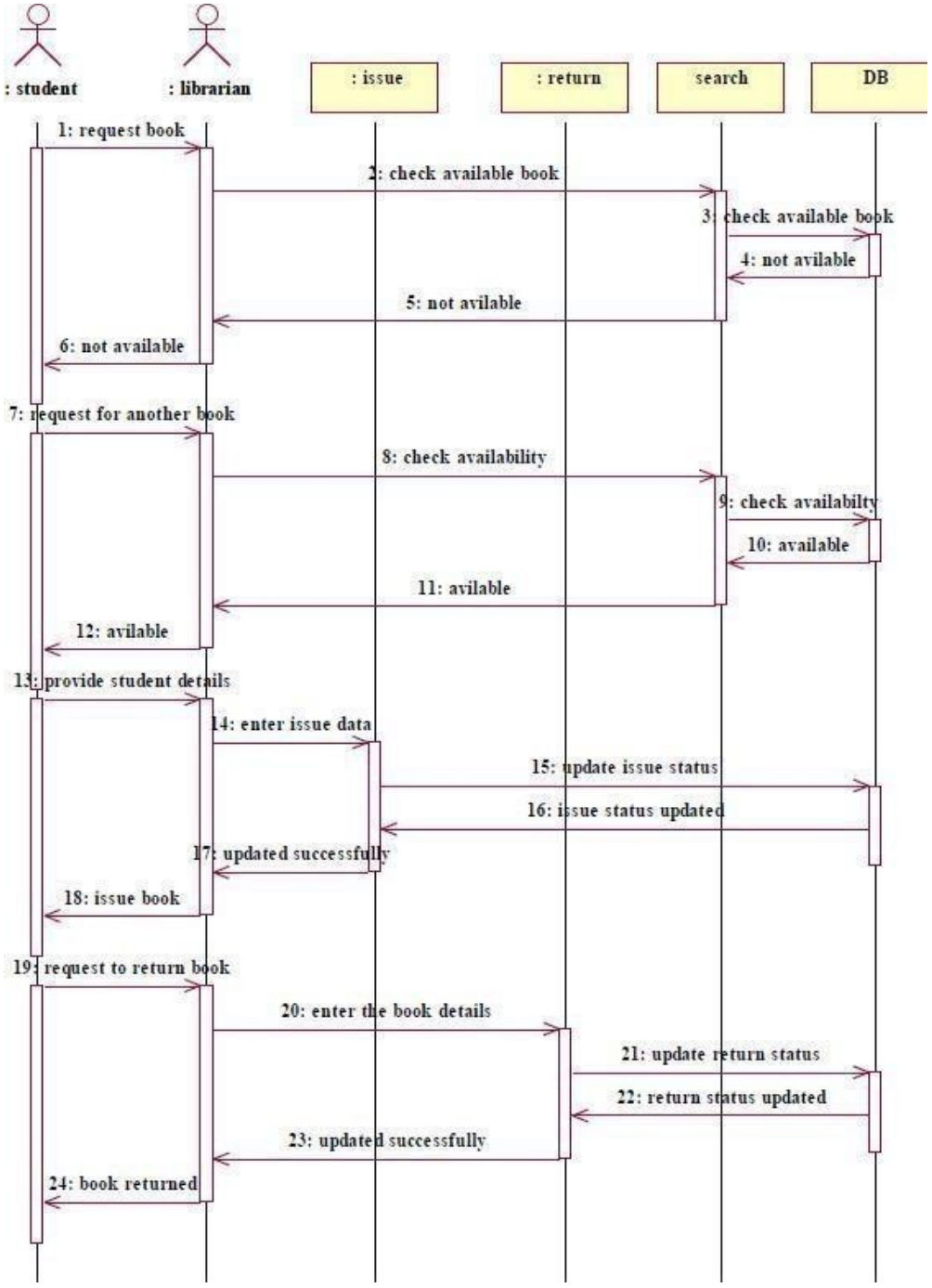


Figure 5. Sequence Diagram for Book Issue & Return

Collaboration Diagram:

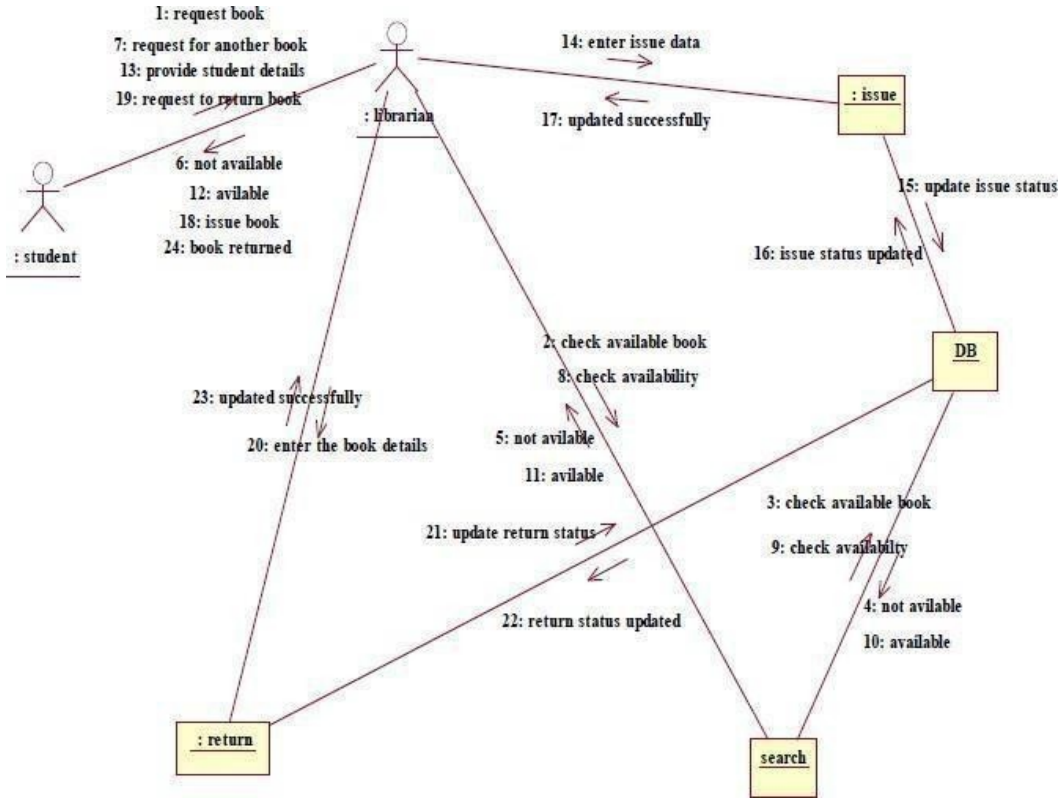


Figure 6. Collaboration Diagram for Book Issue & Return

Class Diagram:

- The class diagram, also referred to as object modeling is the main static analysis diagram.
- The main task of object modeling is to graphically show what each object will do in the problem domain.
- The problem domain describes the structure and the relationships among objects.

The ATM system class diagram consists of five classes:

1. Student
2. Book
3. Issue
4. Return
5. Vendor
6. Details

1) Student:

- It consists of twelve attributes and three operations.
  - The attributes are enroll no, name, DOB, father name, address, dept name, batch and book limits.
- The operations of this class are addStInfo(), deleteStInfo(), modifyStInfo().

2) Book:

- It consists of ten attributes and four operations.
- This class is used to keep book information such as author, title, vendor, price, etc.

3) Issue:

- It consists of eight attributes and two operations to maintain issue details such as, issue date, acc no of issued book, name of the student who borrowed book.

4) Return:

- It consists of eight attributes and two operations to maintain issue details such as, issue date, acc no of issued book, name of the student who borrowed book.

5) Students:

- The attributes of this class are name, dept, year, bcode no.
- The operation is display students ().

6) Details:

- The attributes of this class are book name, author, bcode no. The operations are delete details().

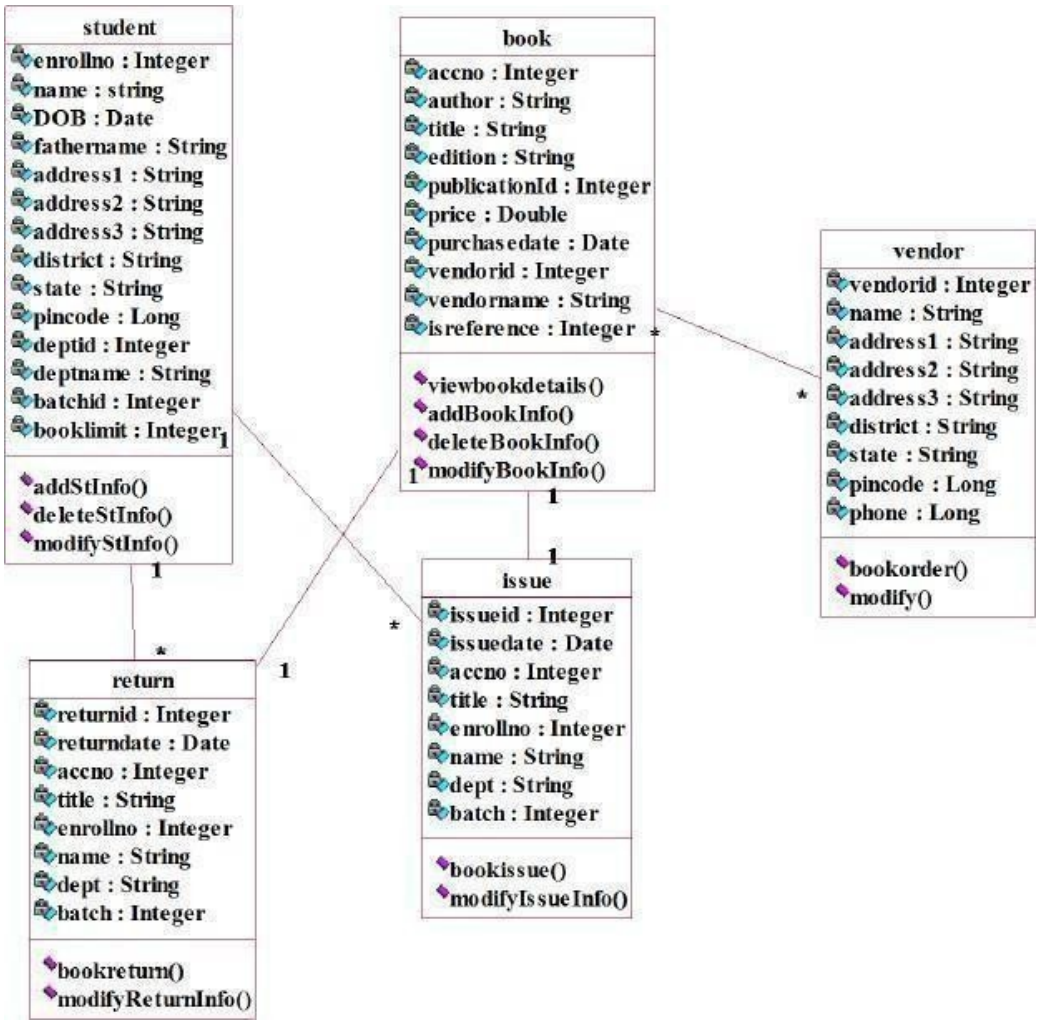


Figure 7. Class Diagram for Book Bank System

State Chart Diagram

It consists of state, events and activities. State diagrams are a familiar technique to describe the behavior of a system. They describe all of the possible states that a particular object can get into and how the object's state changes as a result of events that reach the object.

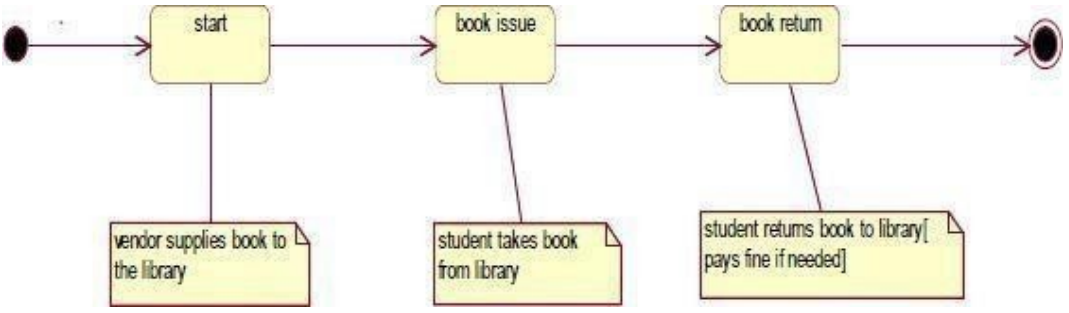


Figure 8. State Chart Diagram for Book Bank System

Week 6

Aim: To develop test cases for unit testing and integration testing.

Unit Testing:

- It is a software development process in which the smallest testable parts of an application, called "units", are individually scrutinized for proper operation.
- Software developers and sometimes QA staff complete unit tests during the development process.

Project Name:

Test Case Template

Test Case ID: Fun_10	**Test Designed by:** <Name>
Test Priority (Low/Medium/High): Med	**Test Designed date:** <Date>
Module Name: Google login screen	**Test Executed by:** <Name>
Test Title: Verify login with valid username and password	**Test Execution date:** <Date>
Description: Test the Google login page	

Pre-conditions: User has valid username and password
Dependencies:

Step	Test Steps	Test Data	Expected Result	Actual Result	Status (Pass/Fail)	Notes
1	Navigate to login page	User: [illegible]	User should be able to login	User is navigated to	Pass	
2	Provide valid username	Password: 1234		dashboard with successful		
3	Provide valid password			login		
4	Click on Login button					

Post-conditions:
User is validated with database and successfully login to account. The account session details are logged in database.

Integration Testing:

- It is a type of software testing where components of the software are gradually integrated and then tested as a unified group.
- Usually, these components are already working well individually, but they may break whenintegrated with other components.

Project Name:	Google Email
Module Name:	Login
Reference Document:	If any
Created by:	Rajkumar
Date of creation:	DD-MMM-YY
Date of review:	DD-MMM-YY

TEST CASE ID	TEST SCENARIO	TEST CASE	PRE-CONDITION	TEST STEPS	TEST DATA	EXPECTED RESULT	POST CONDITION	ACTUAL RESULT	STATUS (PASS/ FAIL)
TC_LOGIN_001	Verify the login of Gmail	Enter valid User Name and valid Password	1. Need a valid Gmail Account to do login	1. Enter User Name	<Valid User Name>	Successful login	Gmail inbox is shown		
				2. Enter Password	<Valid Password>				
				3. Click "Login" button					
TC_LOGIN_001	Verify the login of Gmail	Enter valid User Name and invalid Password	1. Need a valid Gmail Account to do login	1. Enter User Name	<Valid User Name>	A message "The email and password you entered don't match" is shown			
				2. Enter Password	<Invalid Password>				
				3. Click "Login" button					
TC_LOGIN_001	Verify the login of Gmail	Enter invalid User Name and valid Password	1. Need a valid Gmail Account to do login	1. Enter User Name	<Invalid User Name>	A message "The email and password you entered don't match" is shown			
				2. Enter Password	<Valid Password>				
				3. Click "Login" button					
TC_LOGIN_001	Verify the login of Gmail	Enter invalid User Name and invalid Password	1. Need a valid Gmail Account to do login	1. Enter User Name	<Invalid User Name>	A message "The email and password you entered don't match" is shown			
				2. Enter Password	<Invalid Password>				
				3. Click "Login" button					

Week 7

Aim: To develop test cases for various white box and black box testing techniques.

White Box Testing:

It is a form of application testing that provides the tester with complete knowledge of the application Being tested, including access to source code and design documents.

Black Box Testing:

It is a form of testing that is performed with no knowledge of a system's internals, can be carried out to evaluate the functionality, security, performance, and other aspects of an application.

LOGIN FORM:

SL.No	Test Case	Excepted Result	Test Result
1	Enter valid name and password & click on login button	Software should display main window	Successful
2	Enter invalid	Software should not display main window	successful

BOOK ENTRY FORM:

SL.No	Test Case	Excepted Result	Test Result
1	On the click of ADD button	At first user have to fill all fields with proper data , if any Error like entering text data instead of number or entering number instead of text..is found then it gives proper message otherwise Adds Record To the Database	successful
2.	On the Click of DELETE Button	This deletes the details of book by using Accession no.	Successful
3.	On the Click of UPDATE Button	Modified records are Updated in database by clicking UPDATE button.	Successful
4.	On the Click of SEARCH Button	Displays the Details of book for entered Accession no. Otherwise gives proper Error message.	Successful
5.	On the Click of CLEAR Button	Clears all fields	Successful
6.	On the Click of EXIT button	Exit the current book details form	successful
7.	On the Click of NEXT button	Display the next form	successful

BOOK RETURN FORM:

SL.No	Test Case	Excepted Result	Test Result
1	On the click of ADD button	At first user have to fill all fields with proper data , if any Error like entering text data instead of number or entering number instead of text..is found then it gives proper message otherwise Adds Record To the Database	successful
2.	On the Click of DELETE Button	Which deletes the details of book by using Register no.	Successful
3.	On the Click of UPDATE Button	Modified records are Updated in database by clicking UPDATE button.	Successful

BOOK ISSUE FORM:

SL.No	Test Case	Excepted Result	Test Result
1	On the click of ADD button	At first user have to fill all fields with proper data ,if the accession number book is already issued then it will giving proper msg.	successful
2.	On the Click of DELETE Button	This deletes the details of book by using Register no.	Successful
3.	On the Click of UPDATE Button	Modified records are Updated in database by clicking UPDATE button.	Successful
4.	On the Click of SEARCH Button	Displays the Details of issued book..Otherwise gives proper Error message.	Successful
5.	On the Click of CLEAR Button	Clears all fields	Successful
6.	On the Click of EXIT button	Exit the current book details form	successful
7.	On the Click of NEXT button	Display the next form	successful

4.	On the Click of SEARCH Button	Displays the Details of returned book ... Otherwise gives proper Error message.	Successful
5.	On the Click of CLEAR Button	Clears all fields	Successful
6.	On the Click of EXIT button	Exit the current book details form	successful
7.	On the Click of NEXT button	Display the next form	successful