

Lab File
Software Engineering
[IT301]

DEPARTMENT
OF
COMPUTER SCIENCE AND ENGINEERING

BACHELOR OF TECHNOLOGY
IN
COMPUTER SCIENCE AND ENGINEERING



Case Study: University Admission Management System

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NOIDA-201301

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Experiment 1

Aim: Formulating the problem statement for University Admission Management System

Problem Statement:

At the beginning of each academic year, a university keeps track of every student who applies. This record is maintained by the university administration. When a student applies, he/she has to provide all details about themselves. The university generates the following based on this information:

1. The preferred stream of the student
2. Eligibility of the student for admission into the preferred stream according to their academic details
3. Students' records based on their demography
4. Names, phone numbers, income and occupations of the pupils' parents

University decides to automate this process of updating the records. The entire process streamlines the process of admission of the student into the university and subsequent steps. If a student provides incomplete information, he/she is asked to apply again.

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Department of Computer Science & Engineering
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Student Name	Manasdeep Singh Bhatia	Enrollment No.	A2305219042
Marking Criteria			
Criteria	Total Marks	Marks Obtained	Comments
Concept (A)	2		
Implementation (B)	2		
Performance (C)	2		
Total	6		

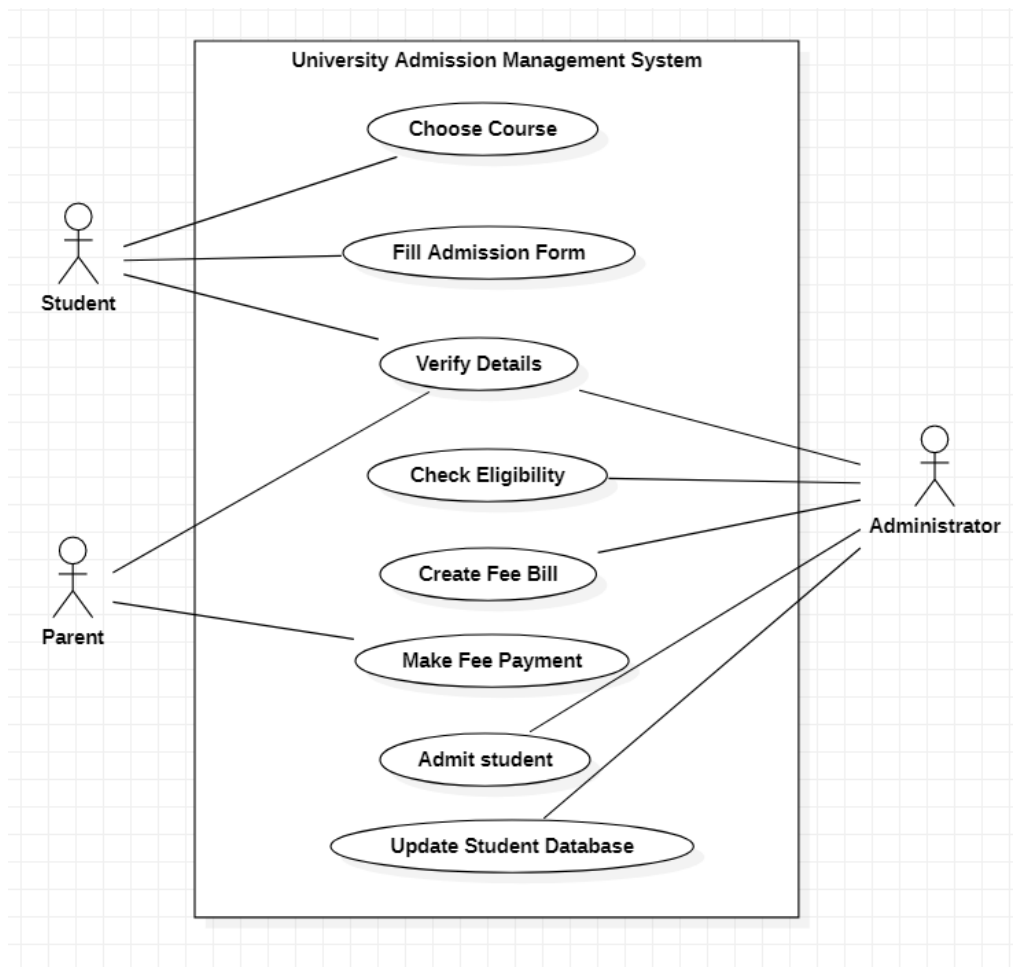
Experiment 2

Aim: To make Use Case Diagram for University Admission Management System

Software Used: Star UML

Theory: The primary form of system/software requirements for an undeveloped software application is a UML use case diagram. The intended behavior (what) is specified in use cases, not the actual technique of achieving it (how). Once defined, use cases can be represented both textually and visually (i.e. use case diagram). A major notion in use case modeling is that it assists us in designing a system from the standpoint of the end user. It's a good way to communicate system behavior to users in their own words by defining every externally apparent system activity.

Diagram:



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Experiment 3

Aim: To Create 0-Level and 1-Level Data Flow Diagram for University Admission Management System

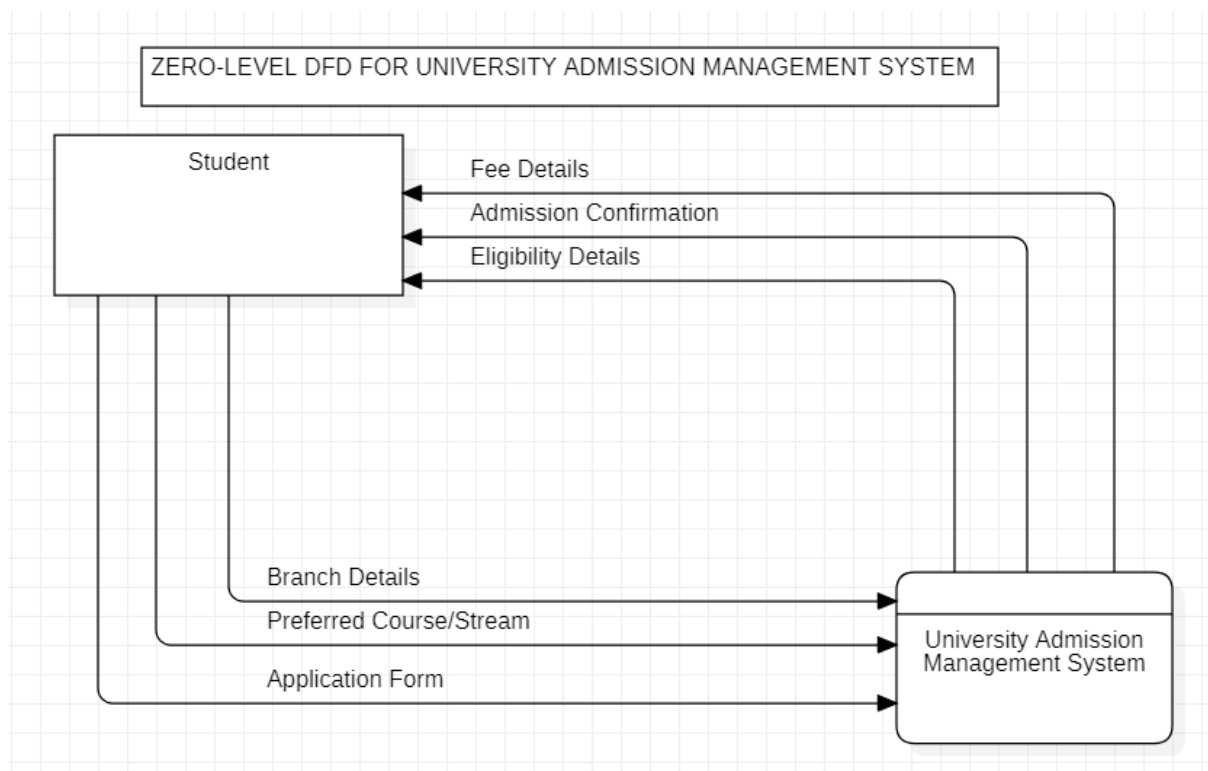
Software Used: Star UML

Theory: DFDs (data flow diagrams) can be used in software engineering to illustrate systems at various degrees of abstraction. Low-level DFDs are partitioned from higher-level DFDs, allowing more information and functional aspects to be hacked. In DFD, levels are numbered 0, 1, 2, or higher.

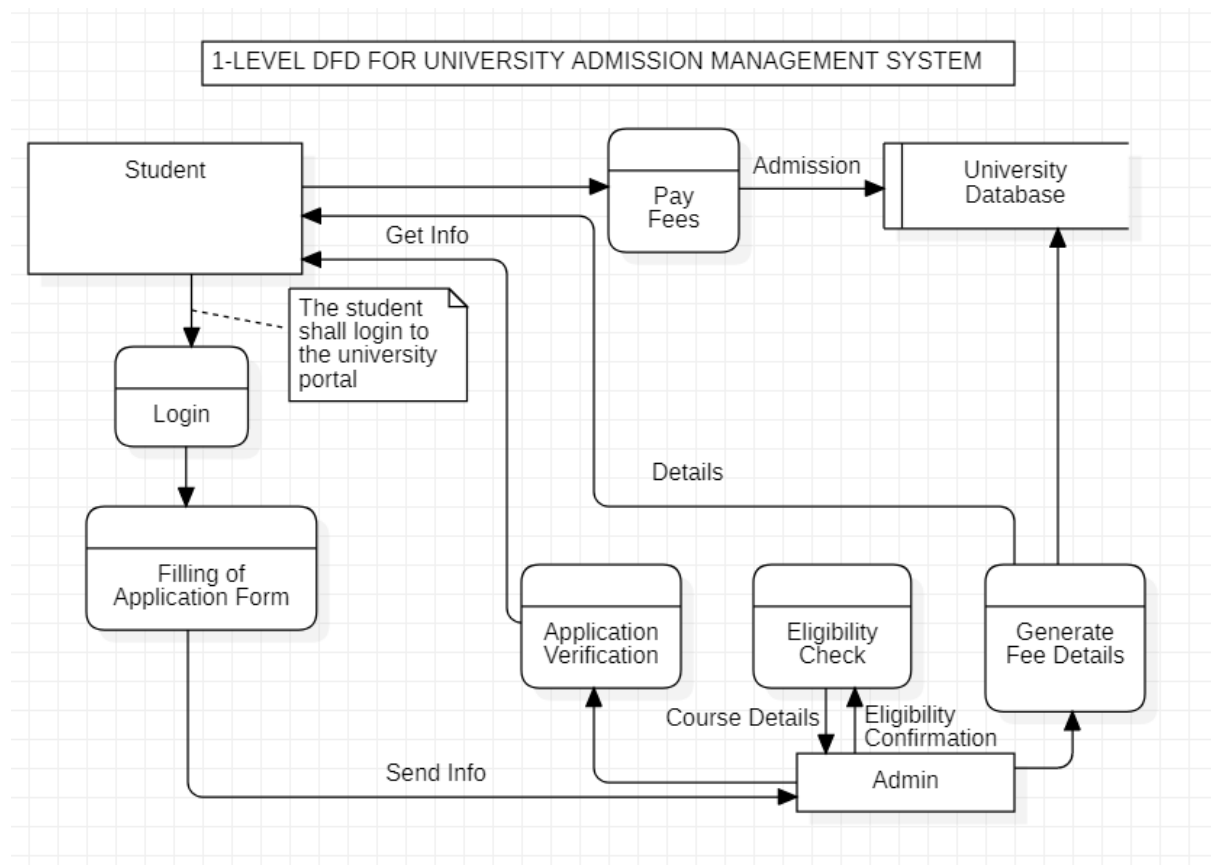
0-Level DFD: A context diagram is another name for it. It's meant to be an abstraction perspective, with the system shown as a single process with external entities. It depicts the complete system as a single bubble with incoming/outgoing arrows indicating input and output data.

1-Level DFD: The context diagram is split into numerous bubbles/processes in 1-level DFD. The essential functions of the system are highlighted at this level, and the high-level process of 0-level DFD is broken down into subprocesses.

0-Level DFD for University Admission Management System:



1-Level DFD for University Admission Management System:



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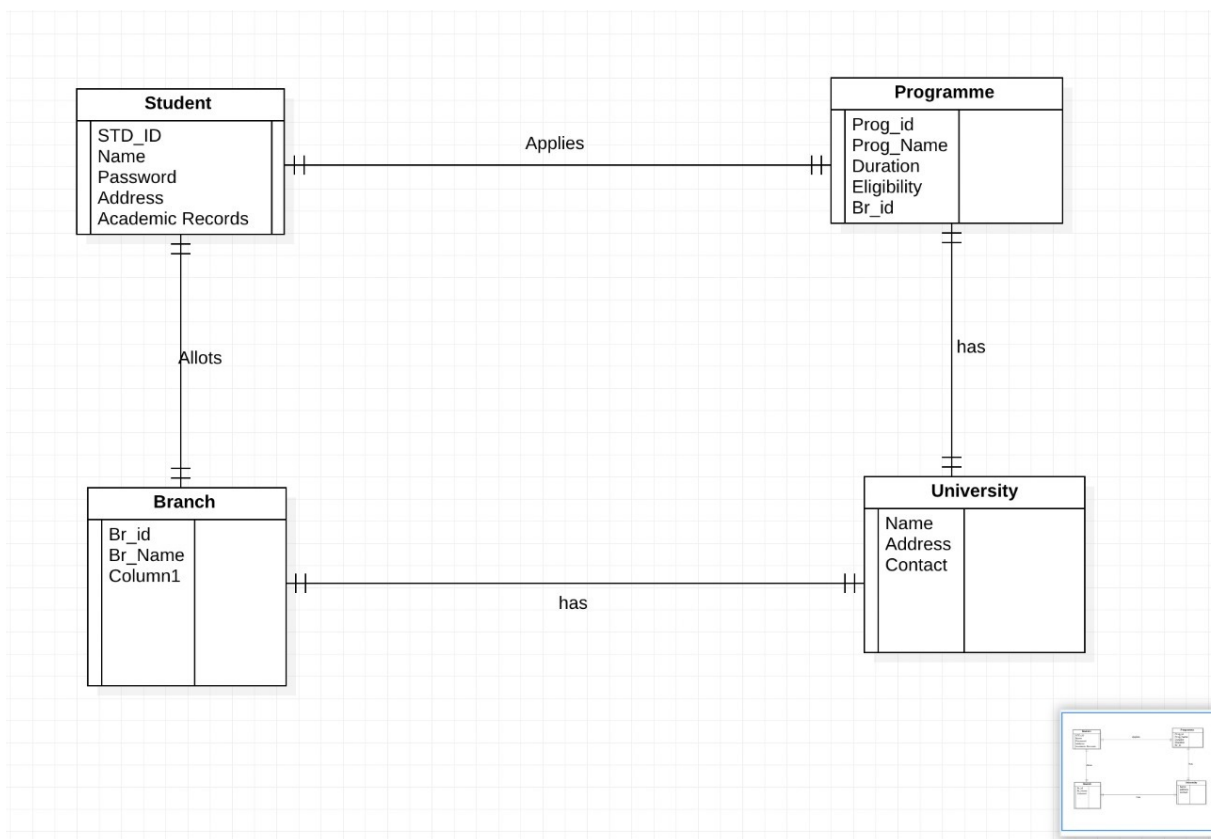
Experiment 4

Aim: To create the E-R Diagram for University Admission Management System

Software Used: Star UML

Theory: The Entity Relationship Diagram (ERD) or Entity Relationship Diagram (ERD) is a diagram that shows the relationship between entity sets contained in a database. In other words, ER diagrams aid in the explanation of database logical structure. Entities, attributes, and relationships are the three main notions that ER diagrams are built on. Rectangles are used to represent entities, ovals are used to describe characteristics, and diamond shapes are used to show relationships in ER Diagrams.

ER DIAGRAM:



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Experiment 5

Aim: To create the Use Case Template for University Admission Management System

Software Used: Star UML

Theory: The Use Case Template is a business document that tells the story of how a system and its actors will be used to accomplish a particular goal. A good Use Case should include a detailed step-by-step description of how the system will be used by the actors to achieve the desired result.

Use Case Template for University Admission Management System :

LOGIN MODULE

1.1 **Introduction** : This is the use case template for the student login into the university portal module,

1.2 **Actors** : Student

1.3 **Pre Conditions** : None

1.4 **Post Conditions** : If the login is successful, the student is admitted into the portal, else not. The system allows a maximum of five trials, after which the account is blocked for a day.

1.5 **Basic Flow** : This use case starts when the student wishes to login to the admission portal of the university.

- System requests that the Student enter his/her username and password
- It also requests the student to enter captcha
- The student enters the details and the captcha asked
- System validates the details, and if the student has entered correct details, he/she is granted access to their respective portal
- End of use case

1.6 **Alternate Flows**

Incorrect Details

- If in the basic flow, the student is found to have entered wrong credentials, he/she is **rejected** access to the admissions portal
- The student can choose to either enter the credentials again or cancel the process
- 5 consecutive failed attempts to login and the student's account is blocked for a day
- End of use case

1.7 *Special Requirements*: None

1.8 *Use Case Relationships*: None

ADMISSION APPLICATION MODULE

1.1 *Introduction* : This is the use case template for the student admission application module

1.2 *Actors* : Parents, Students, Administrator

1.3 *Pre Conditions* : None

1.4 *Post Conditions* : If the use case is successful, the student's application is accepted by the university, else not.

1.5 *Basic Flow* : This use case starts when the student wishes to take admission into the university.

- Admin requests that the Student enter his/her name, academic records, parent's details and address.
- It also requests the student to pick their desired program.
- The student enters the details and chooses their program of choice.
- Admin validates the details, and if the student is **eligible** according to the program eligibility criteria, he/she is given fee details
- If the parent pays the fees within the deadline, the student receives an admission letter and admission is confirmed. Else, not
- End of use case

1.6 *Alternate Flows*

Student Not eligible

- If in the basic flow, the student is found not eligible or fee is not paid, he/she is **rejected** the admission.
- The student can choose to either return to the beginning of the basic flow or cancel the process.
- End of use case

1.7 *Special Requirements*: None

1.8 *Use Case Relationships*: None

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Experiment 6

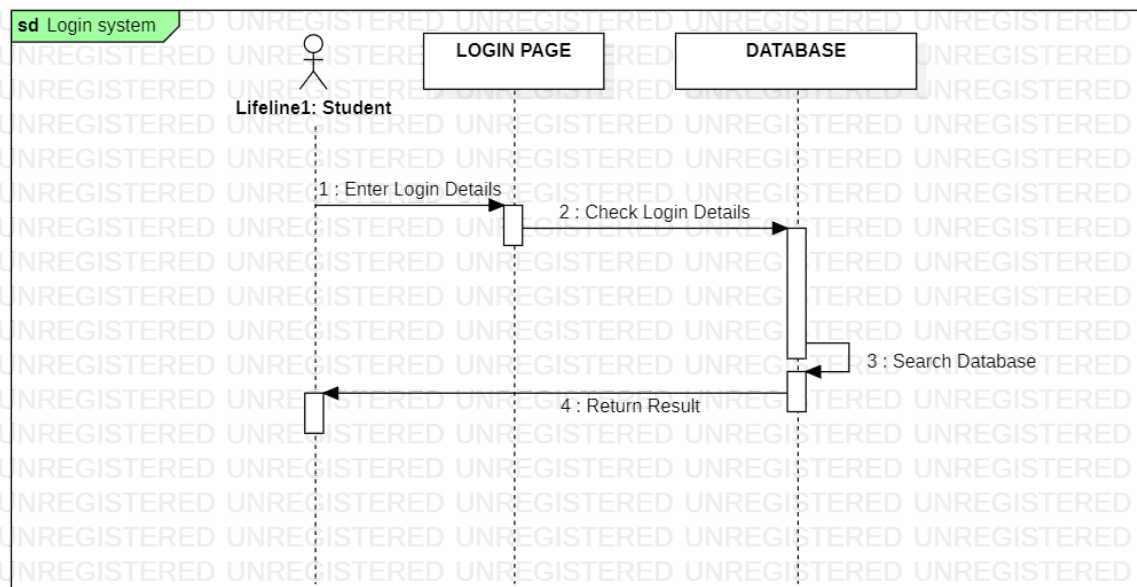
Aim: To create the Sequence Diagram for the University Admission Management System

Software Used: Star UML

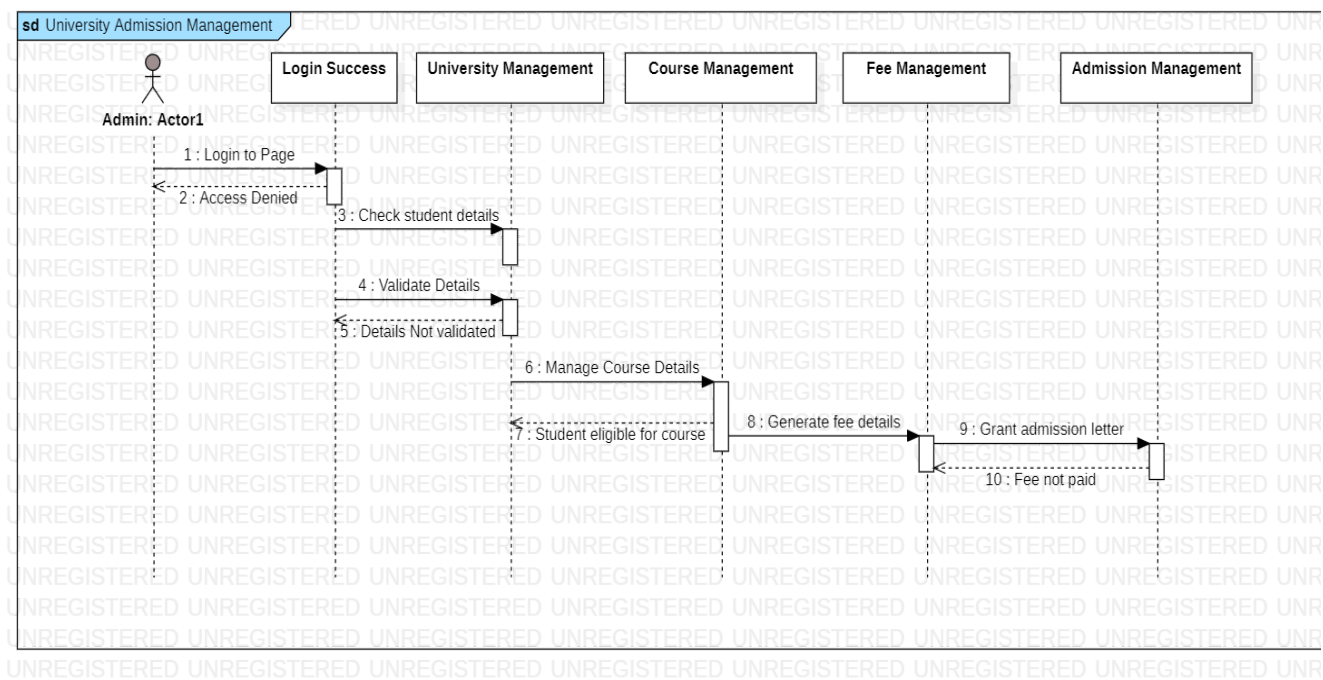
Theory: Sequence diagram represents the scenario's objects as well as the sequence of messages exchanged between them in order to carry out the scenario's functionality. Because they focus on lifelines, or processes and objects that exist concurrently, and the messages transferred between them to execute a function before the lifeline expires, sequence diagrams are a common dynamic modeling method in UML.

Sequence Diagram:

Login System



Admission Management System



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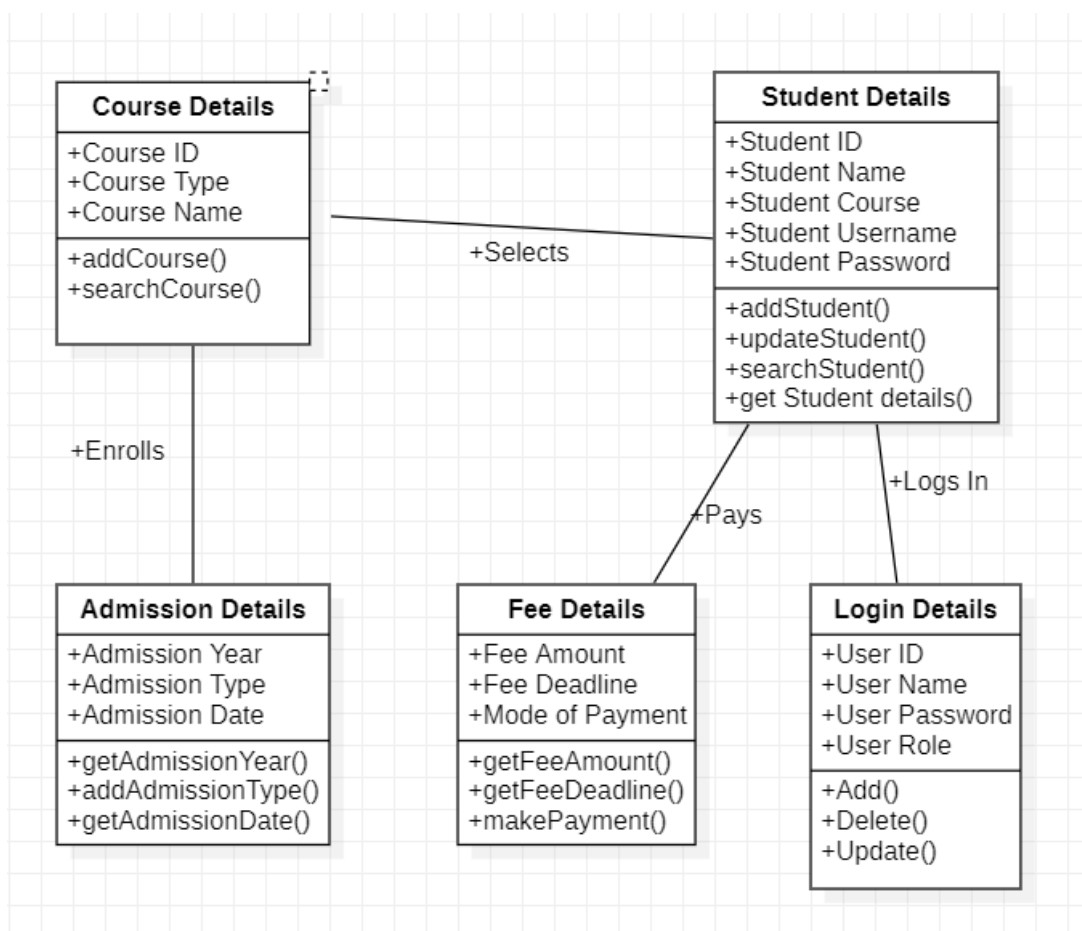
Experiment 7

Aim: To create the Class Diagram for the University Admission Management System

Software Used: Star UML

Theory: The class diagram is a fundamental component of object-oriented modelling. It is used for both general conceptual modelling of the application's structure and detailed modelling, which involves turning the models into computer code. Data modelling may also be done with class diagrams.

Class Diagram:



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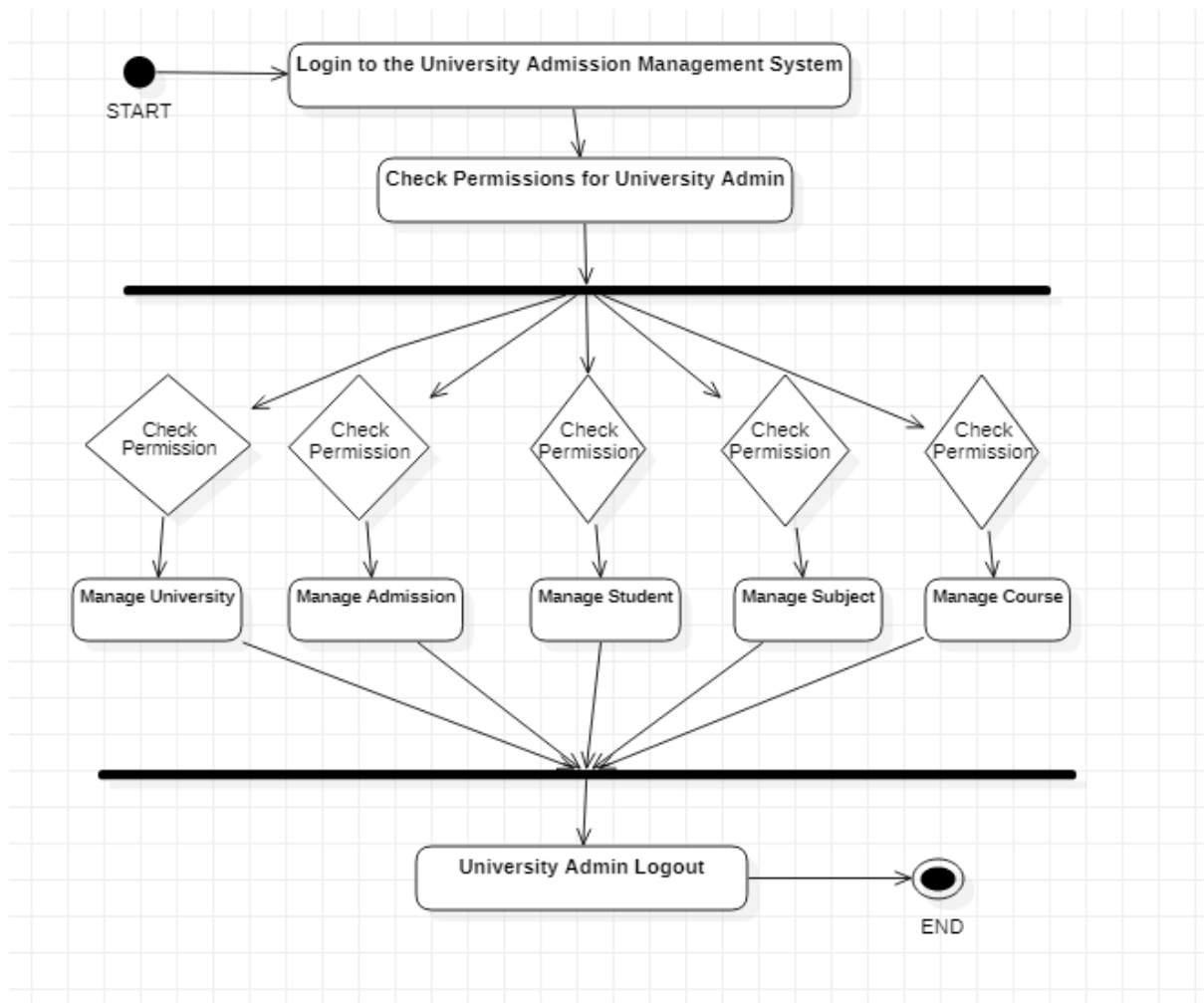
Experiment 8

Aim: To create the Activity Diagram for the University Admission Management System

Software Used: Star UML

Theory: Another essential diagram in UML for describing the dynamic characteristics of the system is the activity diagram. An activity diagram is a flowchart that depicts the movement of information from one action to the next. The action can be defined as a system operation. From one action to the next, the control flow is depicted. This flow might be sequential, branching, or running at the same time. Different elements such as fork, join, and others are used in activity diagrams to cope with various types of flow control.

Activity Diagram:



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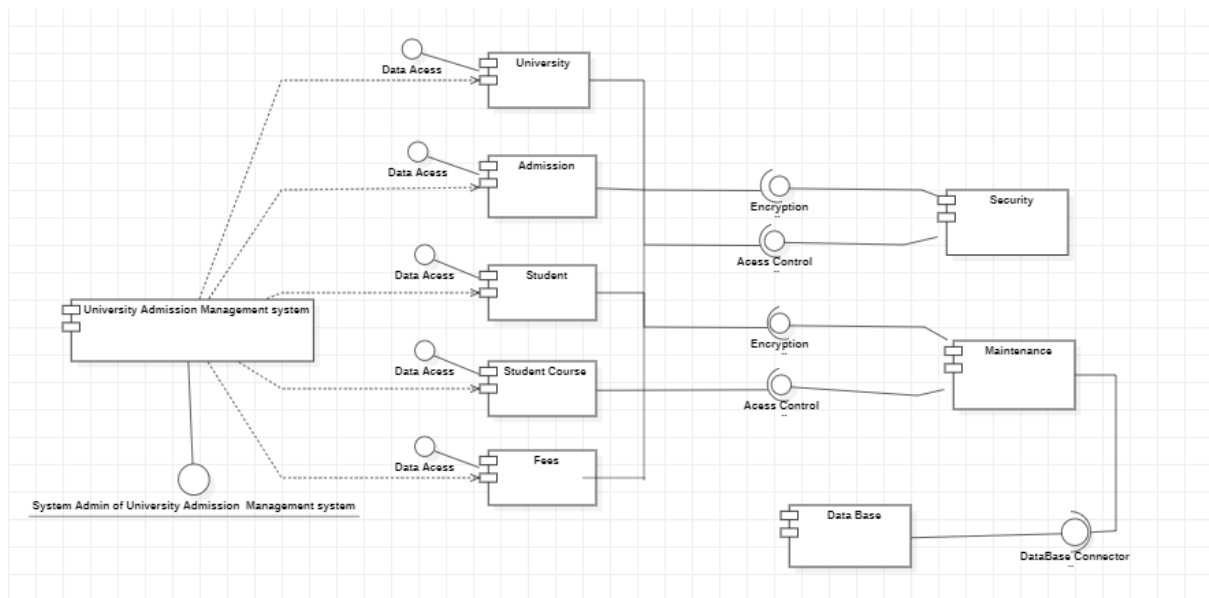
Experiment 9

Aim: To create the Component Diagram for the University Admission Management System

Software Used: Star UML

Theory: A component diagram in the Unified Modeling Language (UML) displays how components are connected together to construct bigger components or software systems. They're used to show how the structure of arbitrarily complicated systems is represented. The needed functionality of a system may be verified using a component diagram. These diagrams are also utilized as a means of communication between the developer and the system's stakeholders. The information provided in a component notation element is expanded by the component diagram. A rectangular compartment attached to the component element is one method of demonstrating the offered and needed interfaces by the specified component.

Component Diagram:



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Experiment 10

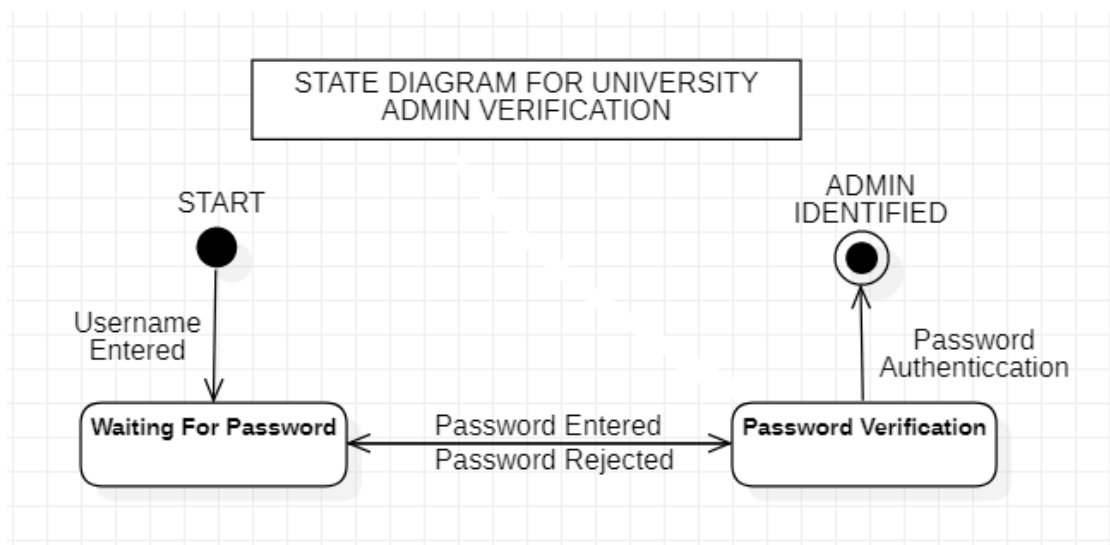
Aim: To create the State Diagram for the University Admission Management System

Software Used: Star UML

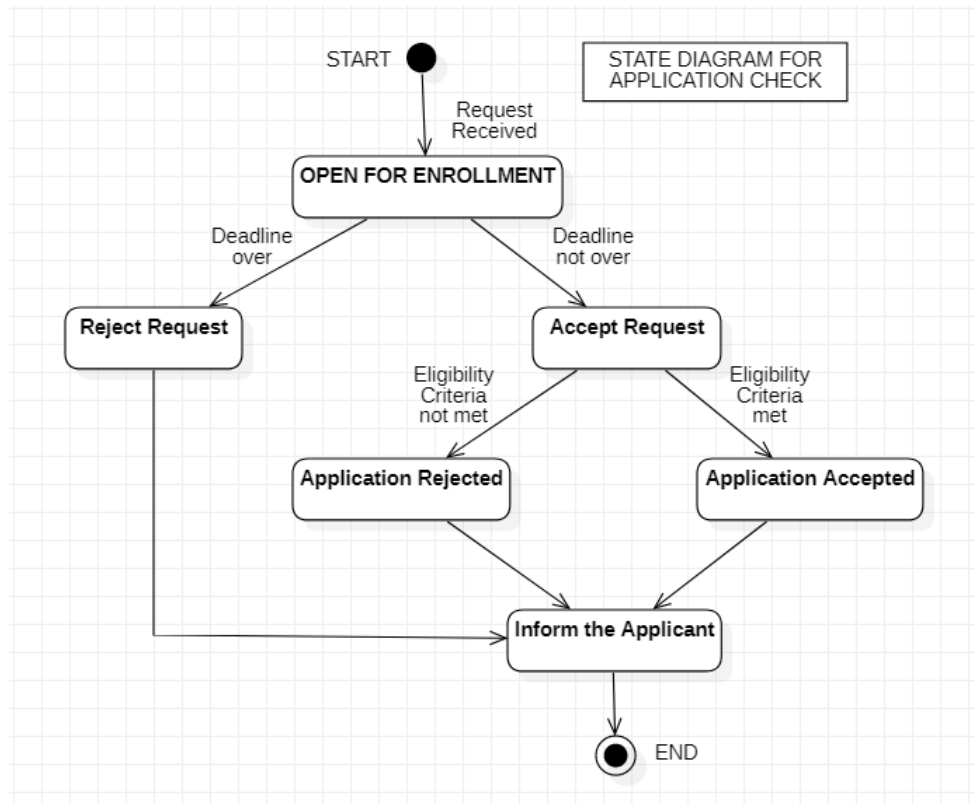
Theory: A state diagram is used to depict the state of a system or a section of a system at a specific point in time. It's a behavioral diagram that uses limited state transitions to illustrate the activity. State diagrams are sometimes known as state machines or state chart diagrams. These words are frequently interchanged. Simply put, a state diagram is a representation of a class's dynamic behavior in reaction to time and changing external stimuli. We can claim that every class has a state, but we don't use State diagrams to depict every class. We like to model states in groups of three or more.

State Diagram:

1. State Diagram for University Admin Verification



2. State diagram for Application Check



Result: State Diagrams for University Admission Management Process were created.

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Performance (C)	2		
Total	6		

Experiment 11

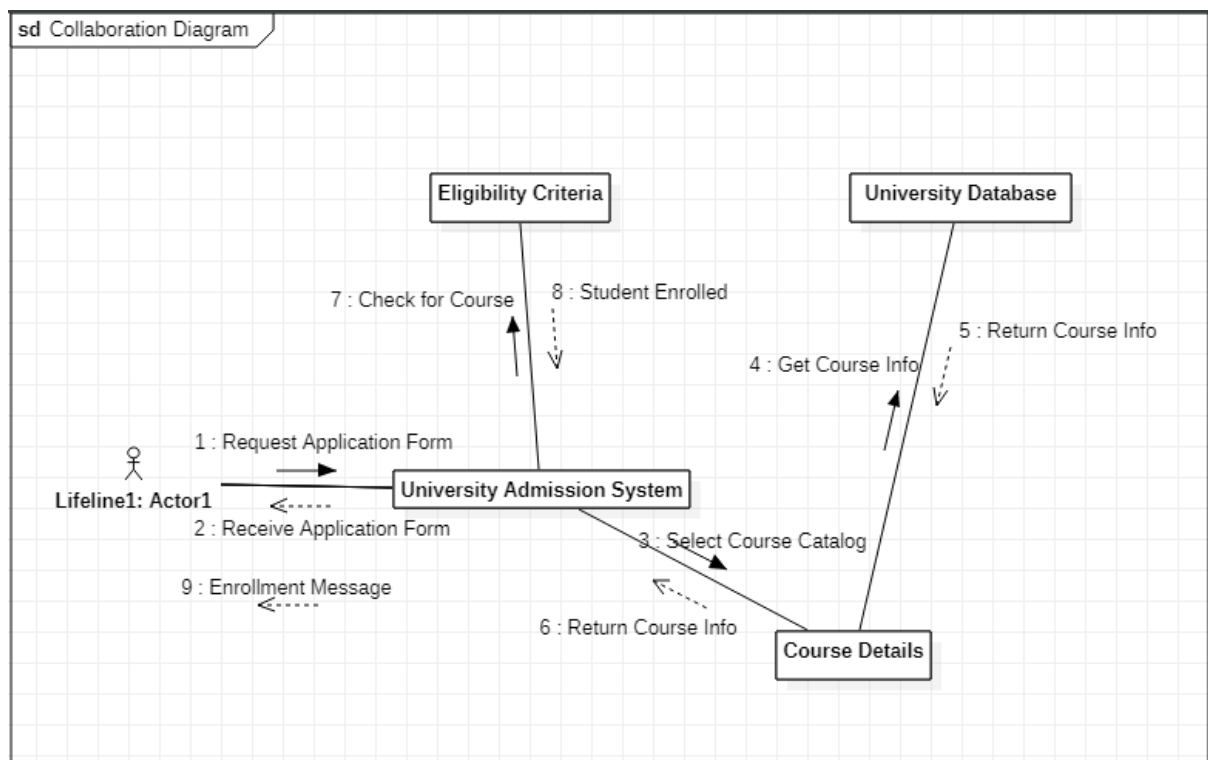
Aim: To Create Collaboration Diagram for University Admission Management System

Software Used: Star UML

Theory: The cooperation diagram is used to depict how items in a system are related to one another. The sequence and cooperation diagrams both depict the same data, but in different ways. It illustrates the architecture of the object living in the system, rather than the flow of messages, because it is based on object-oriented programming. A feature is one of numerous that make up an item. Several items in the system are related to one another. The collaboration diagram, also known as a communication diagram, is used to depict the architecture of an item in a system.

When it is necessary to illustrate the relationship between the objects, collaborations are employed. The sequence and cooperation diagrams both depict the same information, but they do so in quite different ways. Use cases are best analyzed using collaboration diagrams.

Collaboration Diagram:



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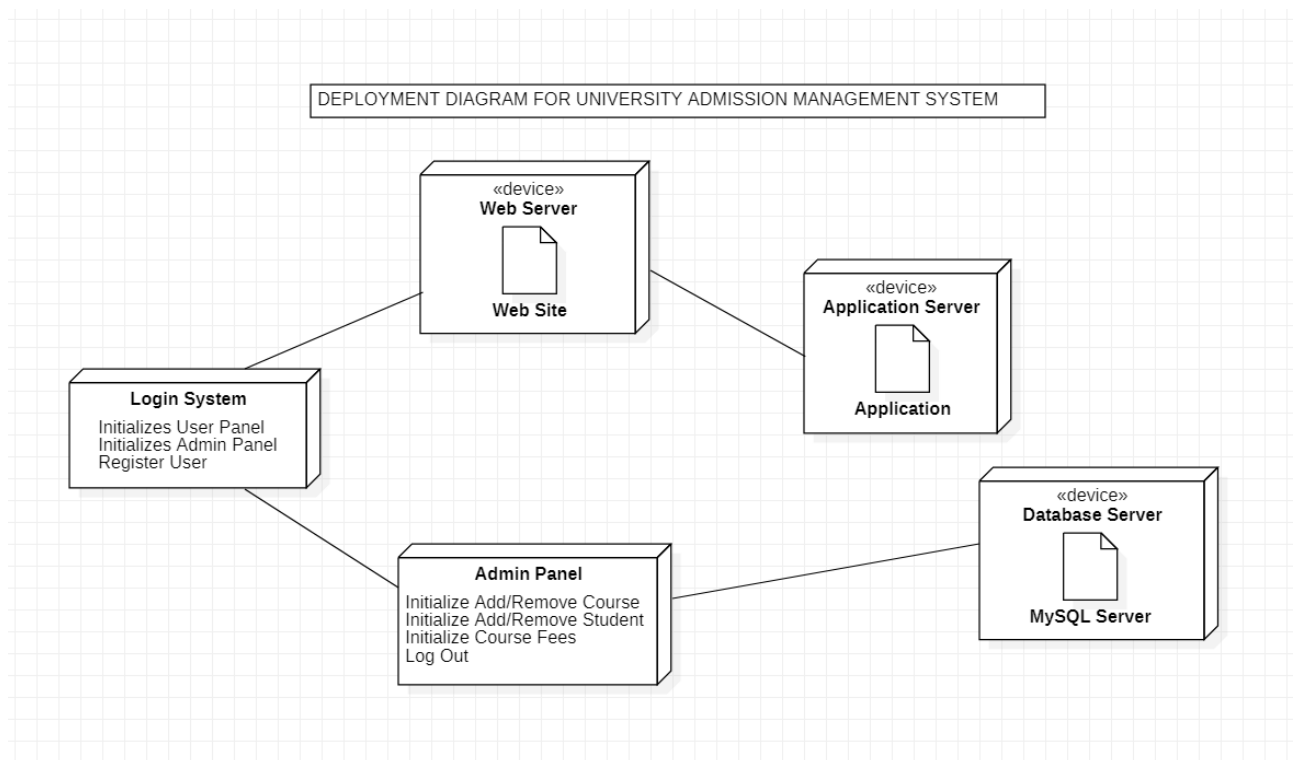
Experiment 12

Aim: To Create Deployment Diagram for University Admission Management System

Software Used: Star UML

Theory: A deployment diagram is a sort of UML diagram that depicts a system's execution architecture, containing nodes like hardware or software execution environments, as well as the middleware that connects them. Deployment diagrams are commonly used to depict a system's physical hardware and software. You may use it to figure out how the system will be physically installed on the hardware. Unlike other UML diagram types, which largely detail the logical components of a system, deployment diagrams assist in depicting the hardware topology of a system. Deployment diagrams are used to illustrate a system's hardware processors, nodes, and devices, as well as the communication links between them and the software files that are placed on that hardware.

Deployment Diagram:



Result: Deployment Diagram for University Admission Management Process was created.

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