

Lab File

Software Engineering [IT301]

DEPARTMENT
OF
COMPUTER SCIENCE AND ENGINEERING

BACHELOR OF TECHNOLOGY
IN
COMPUTER SCIENCE AND ENGINEERING



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Experiment-1

Aim: Formulating the problem statement for A Covid Facility Management System

Problem Statement:

A hospital has a quarantine facility, our aim is to create a management system for all patients who have COVID 19 and the supplies that the hospital has to offer. Our aim is to identify, clarify, and organize system requirements of the Hospital Management System for all covid patients and doctors assigned to the department.

This hospital is supposed to periodically monitor the condition of the patients. Availability of beds and ICUs room On the basis of this record the hospital generates the list of everything

Until now the hospital was keeping the record in a manual registry, now the Hospital is trying to automate the record of supplies and beds availability at the quarantine facility. The proposed system should have these following properties/ records:

- ICU rooms
- Oxygen Beds
- List of Doctors available
- List of Nurses/Staff available
- List of Patients

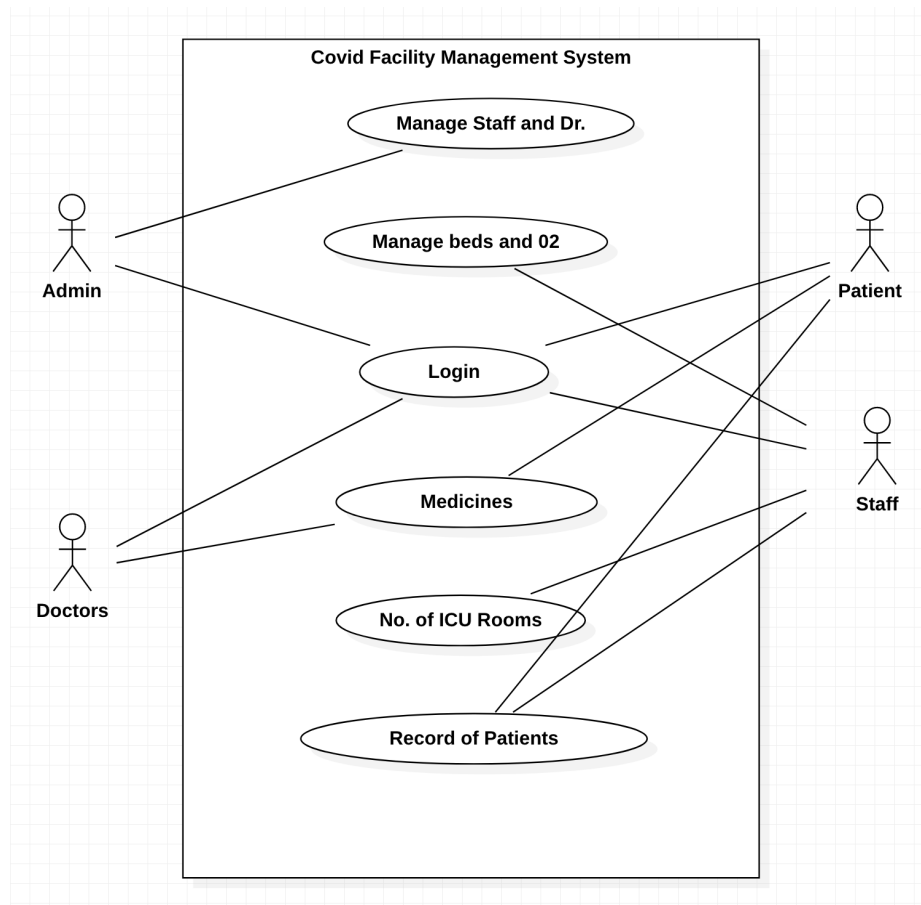
Experiment-2

Aim: Designing a Use Case Diagram for A Covid Facility Management System

Software Used: Excalidraw

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.

Use Case Diagram:



Experiment-3

Aim: Creating 0-Level and 1-Level Data Flow Diagrams for A Covid Facility Management System

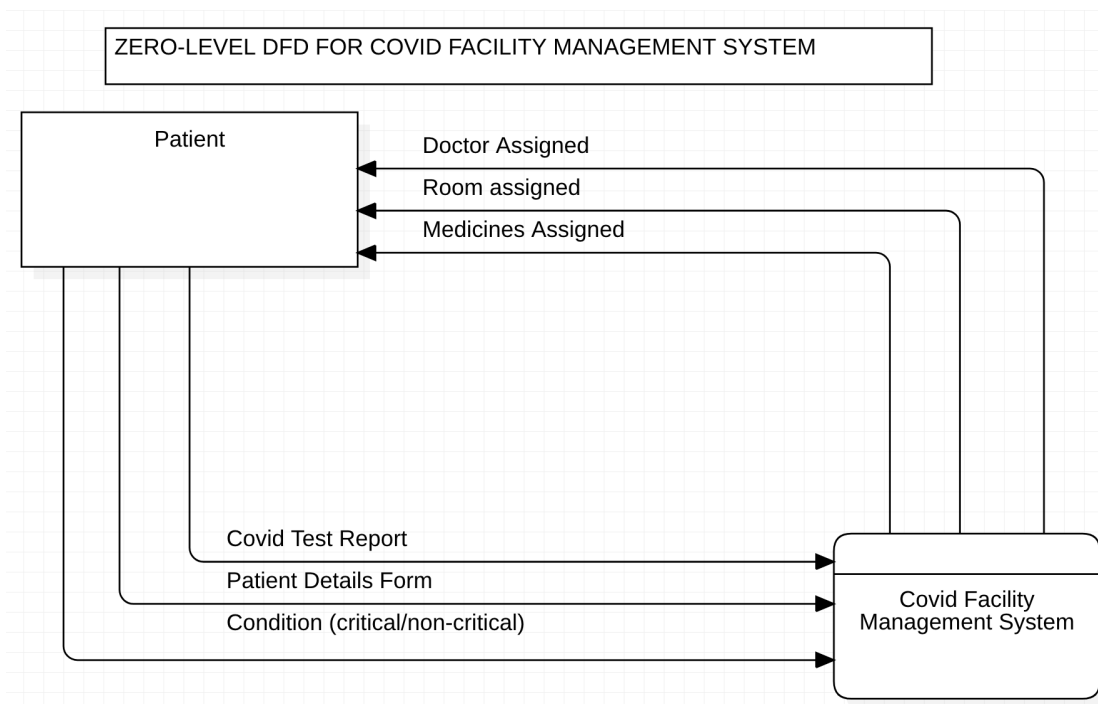
Software Used: Star UML

Theory: 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.

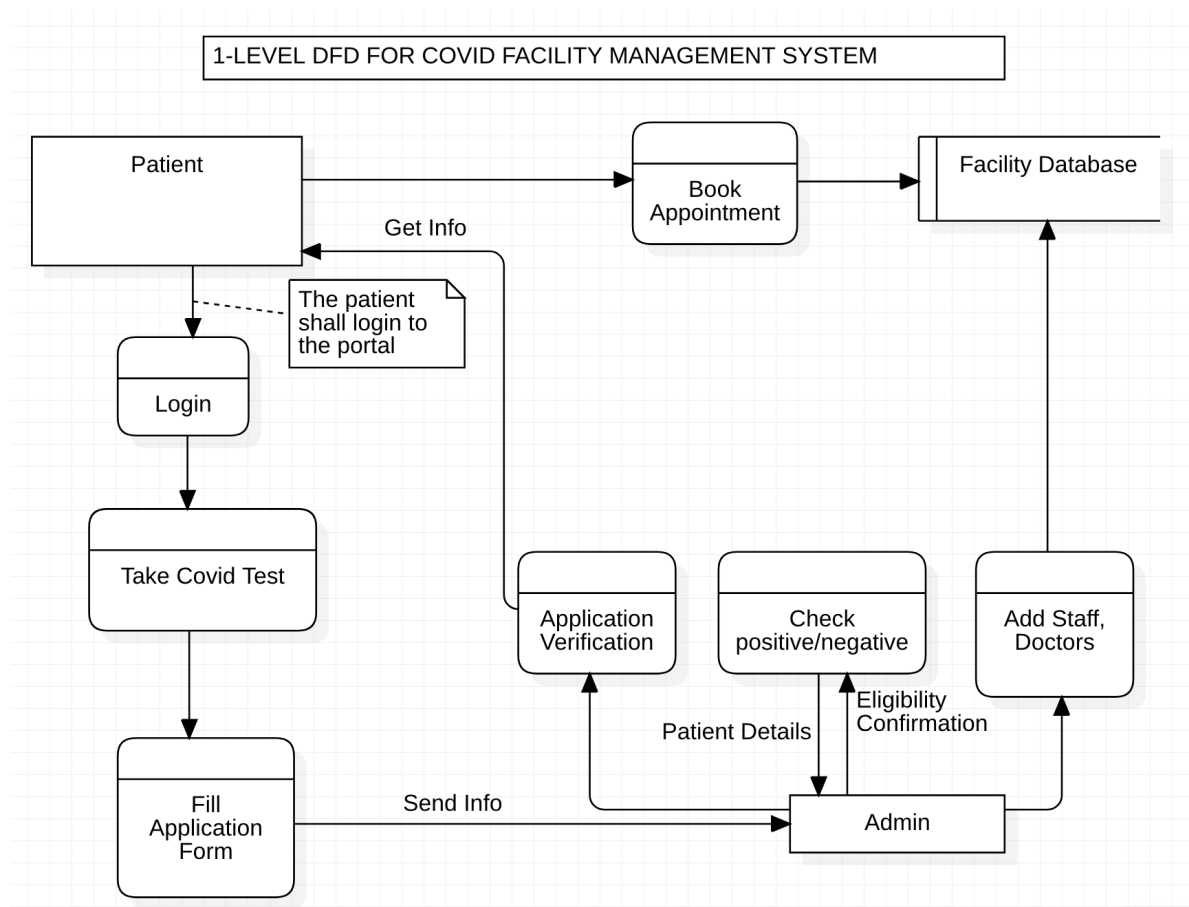
0-Level DFD: A context diagram is another name for it. It's meant to be an abstraction perspective, with the system shown as a single process with external entities. It depicts the complete system as a single bubble with incoming/outgoing arrows indicating input and output data.

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:



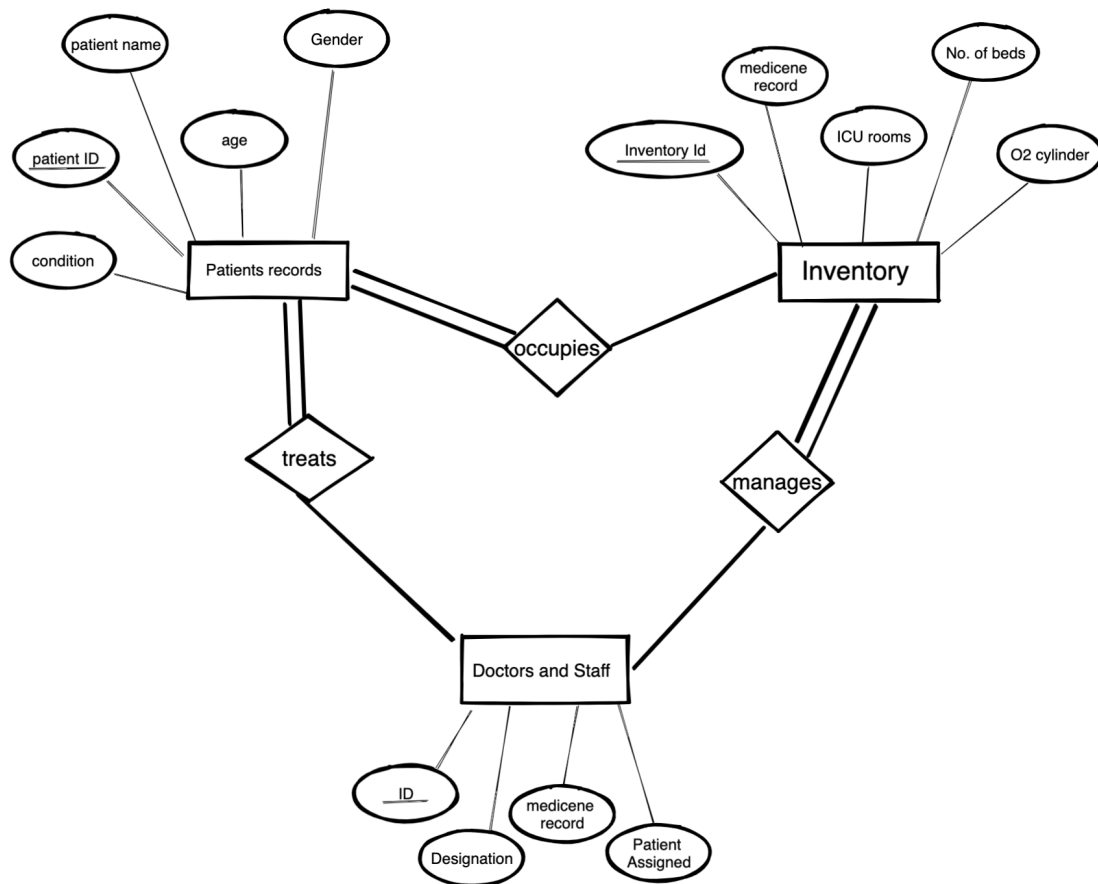
Experiment-4

Aim: Creating the E-R Diagram for A Covid Facility Management System

Software Used: Excalidraw

Theory: ER Diagram or Entity Relationship Diagram, also known as ERD is a diagram that displays the relationship of entity sets stored in a database. In other words, ER diagrams help to explain the logical structure of databases. ER diagrams are created based on three basic concepts: entities, attributes and relationships. ER Diagrams contain different symbols that use rectangles to represent entities, ovals to define attributes and diamond shapes to represent relationships.

ER Diagram:



Experiment-5

Aim: Creating the Use Case Template for A Covid Facility Management System

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 Covid Facility Management System:

LOGIN MODULE

1.1 **Introduction** : This is the use case template for the Staff/Doctor/Administrator login into the Facility portal module

1.2 **Actors** : Staff, Doctor, Administrator

1.3 **Pre Conditions** : None

1.4 **Post Conditions** : If the login is successful, the actor is admitted into the portal, else not. The system allows a maximum of five trials, after which the account is blocked for 30 minutes.

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

- System requests that the Actor enter his/her username and password
- It also requests the student to enter captcha
- The Actor enters the details and the captcha asked
- System validates the details, and if the Actor 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 Actor is found to have entered wrong credentials, he/she is **rejected** access to the portal
- The Actor can choose to either enter the credentials again or cancel the process
- 5 consecutive failed attempts to login and the account is blocked for a 30 minutes
- End of use case

1.7 **Special Requirements**: None

1.8 *Use Case Relationships*: None

PATIENT ADMISSION MODULE

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

1.2 *Actors*: Staff, Patient

1.3 *Pre Conditions* : None

1.4 *Post Conditions* : If the use case is successful, the patient is successfully admitted into the facility

1.5 *Basic Flow* : This use case starts when the patient has tested positive for the Covid test

- The Administrator requests that the Staff enter the patient's name, age, address, previous records, ID and condition.
- It also requests the student to pick their desired room choice if admitted
- The administrator validates the details, and if the patient has been **positive** tested, then he/she is assigned a doctor's appointment
- End of use case

1.6 *Alternate Flows*

Student Not eligible

- If in the basic flow, the patient is found to be negative tested then he/she is **rejected** the admission.
- End of use case

1.7 *Special Requirements*: None

1.8 *Use Case Relationships*: None

Experiment-6

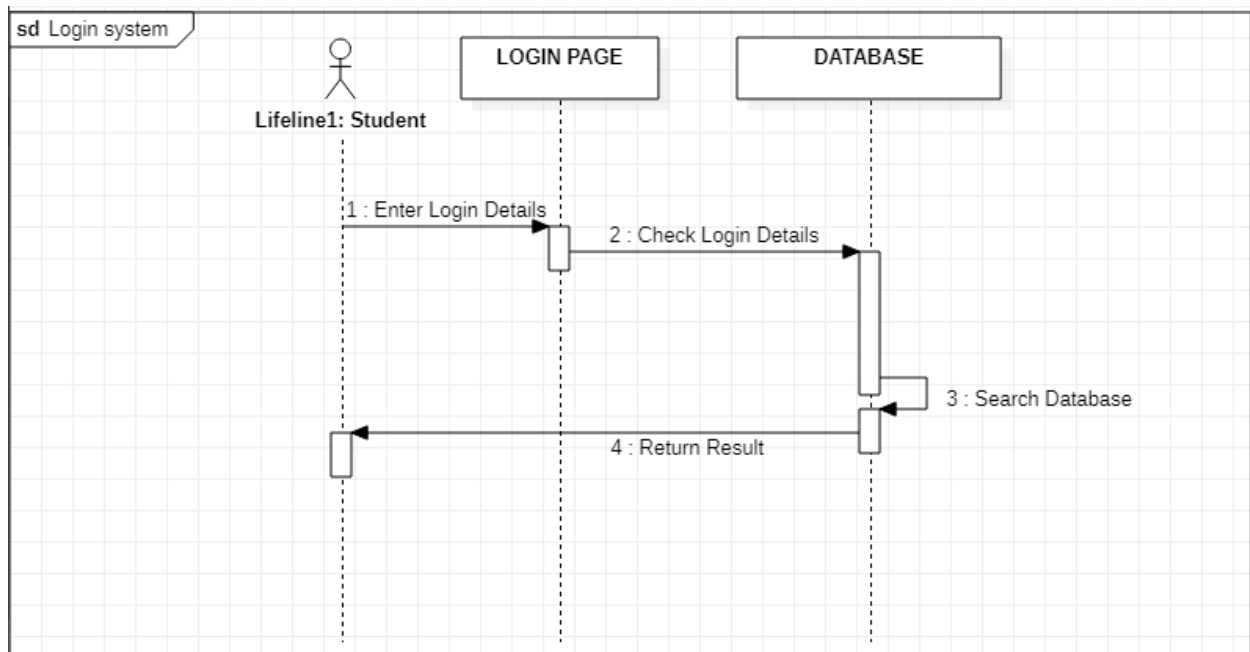
Aim: Create the Sequence Diagram for A Covid Facility Management System

Software Used: Star UML

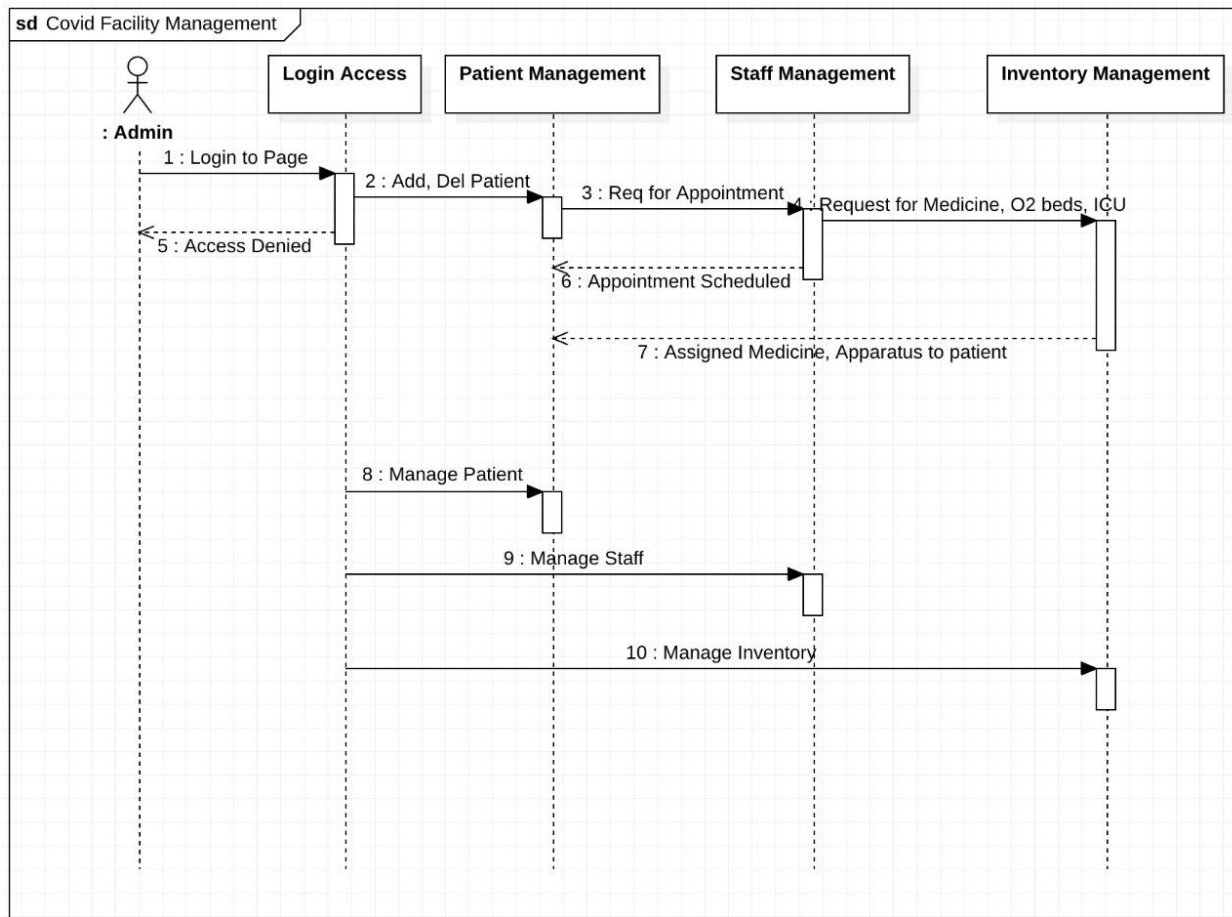
Theory: Sequence diagram represents the scenario's objects as well as the sequence of messages exchanged between them in order to carry out the scenario's functionality. Because they focus on lifelines, or processes and objects that exist concurrently, and the messages transferred between them to execute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

Sequence Diagram:

Login System:



Covid Facility Management System:



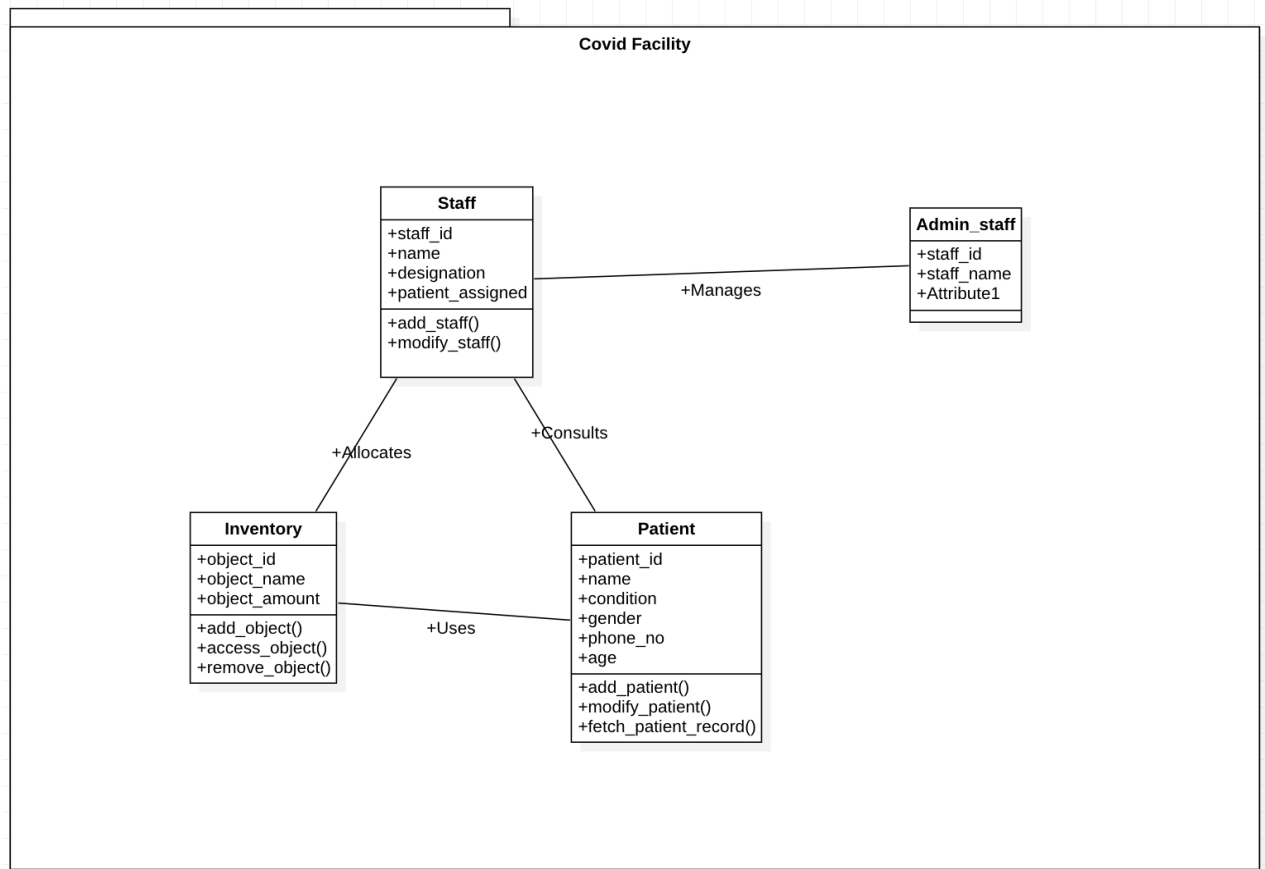
Experiment-7

Aim: Create the Class Diagram for A Covid Facility 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:



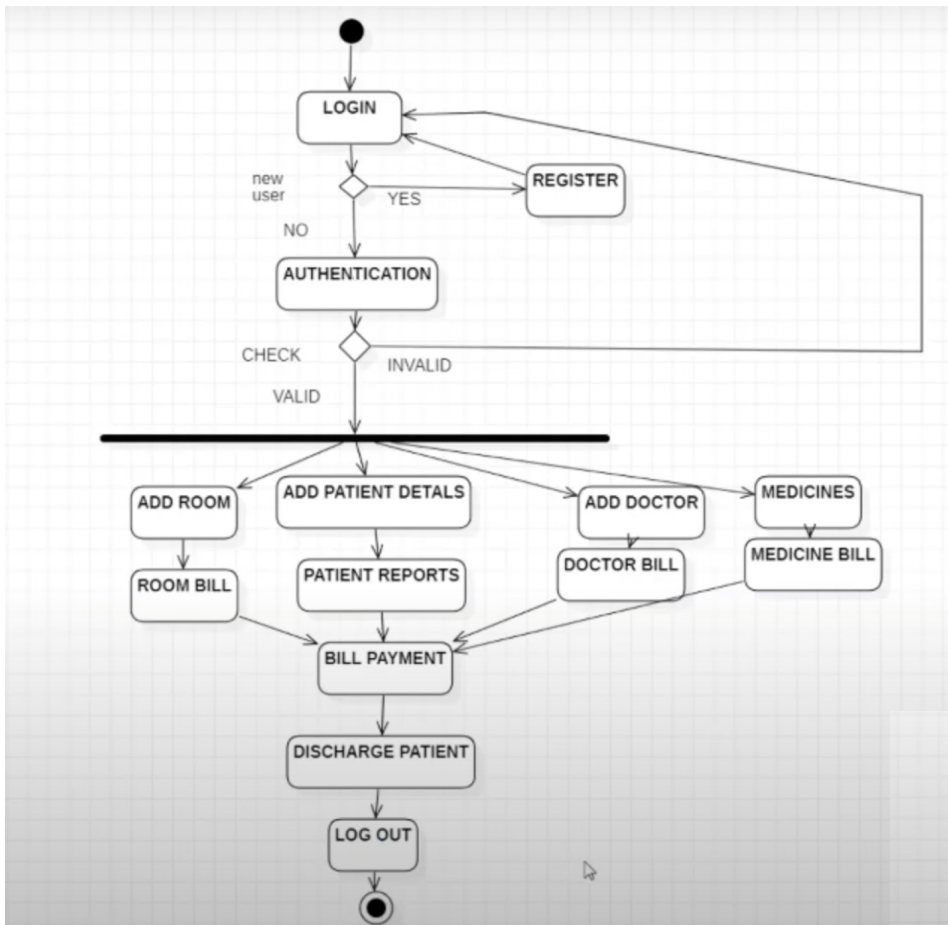
Experiment-8

Aim: Create an Activity Diagram for A Covid Facility Management System

Software Used: Star UML

Theory: Used 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. 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:



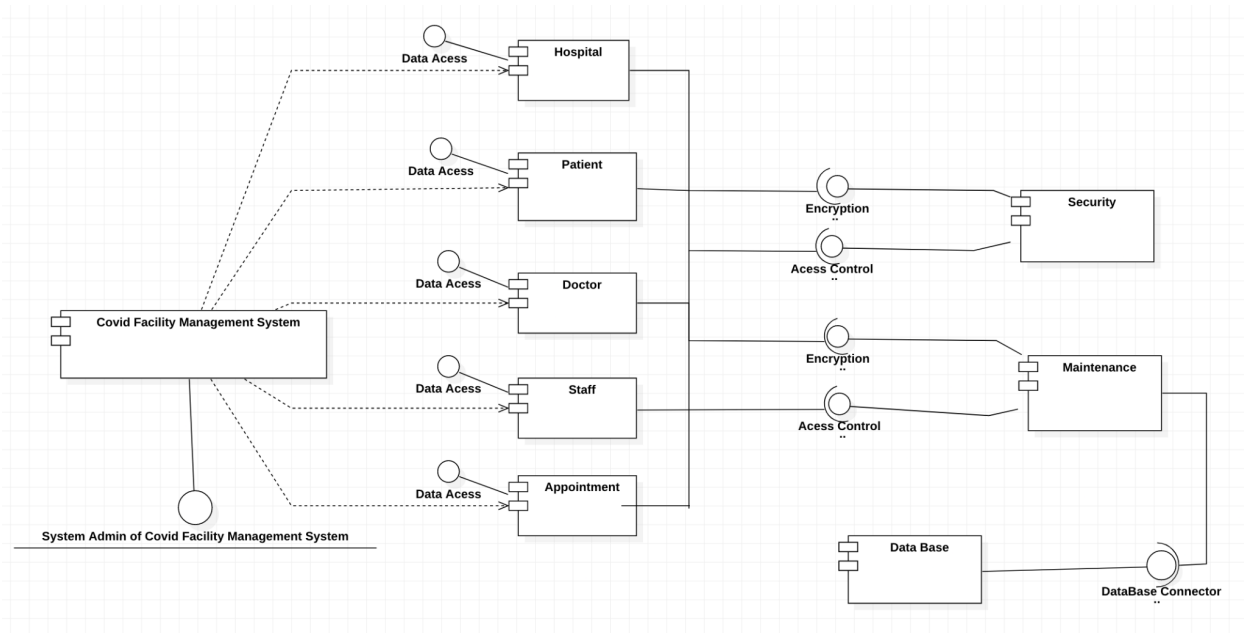
Experiment-9

Aim: Create the Component Diagram for A Covid Facility 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. 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:



Experiment-10

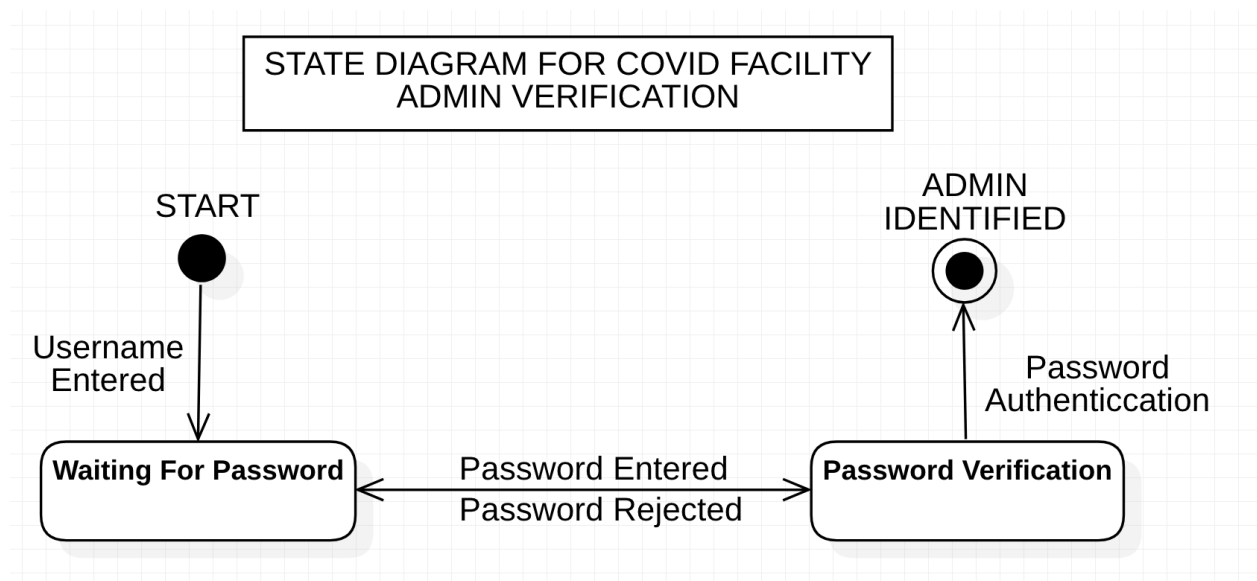
Aim: Create the State Diagram for A Covid Facility Management System

Software Used: Star UML

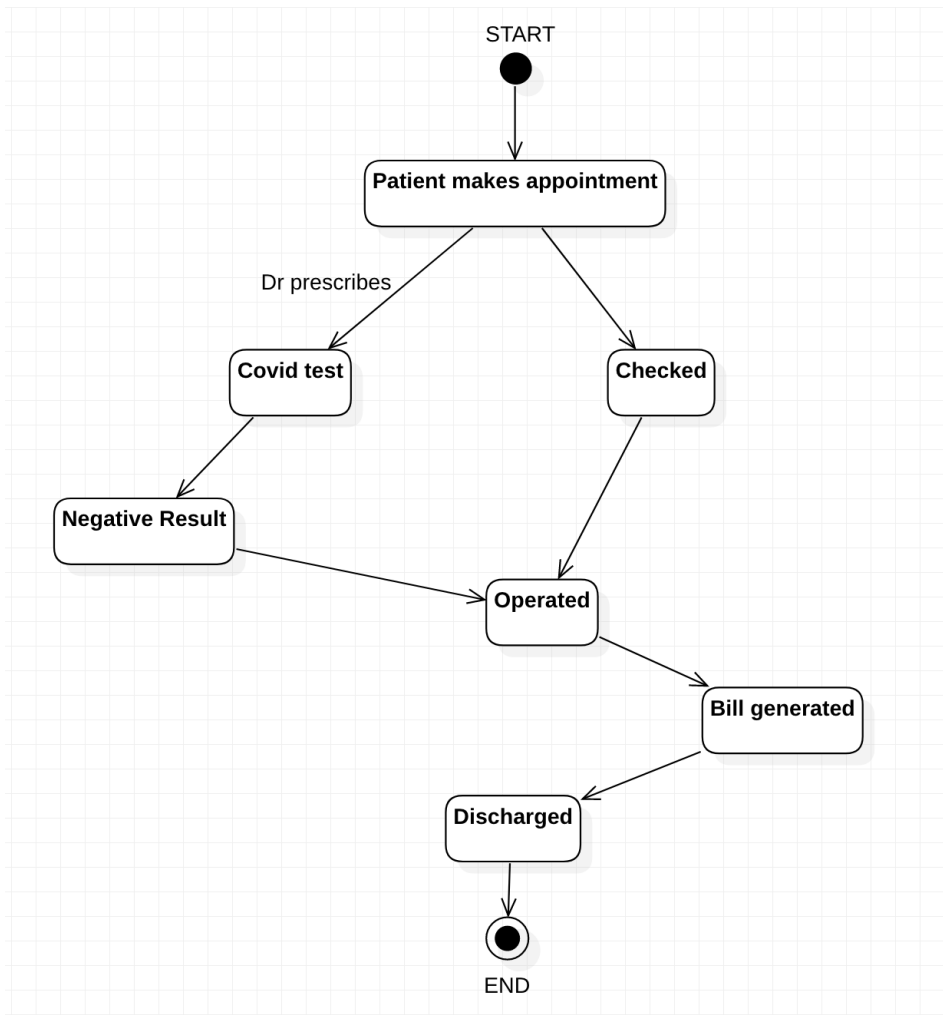
Theory: A state diagram is used to depict the state of a system or a section of a system at a specific point in time. State diagrams are sometimes known as state machines or state chart diagrams. Simply put, a state diagram is a representation of a class's dynamic behavior in reaction to time and changing external stimuli.

State Chart Diagram:

1. State Diagram for Covid Facility Admin Verification



2. State Diagram for Patient Admission



Experiment-11

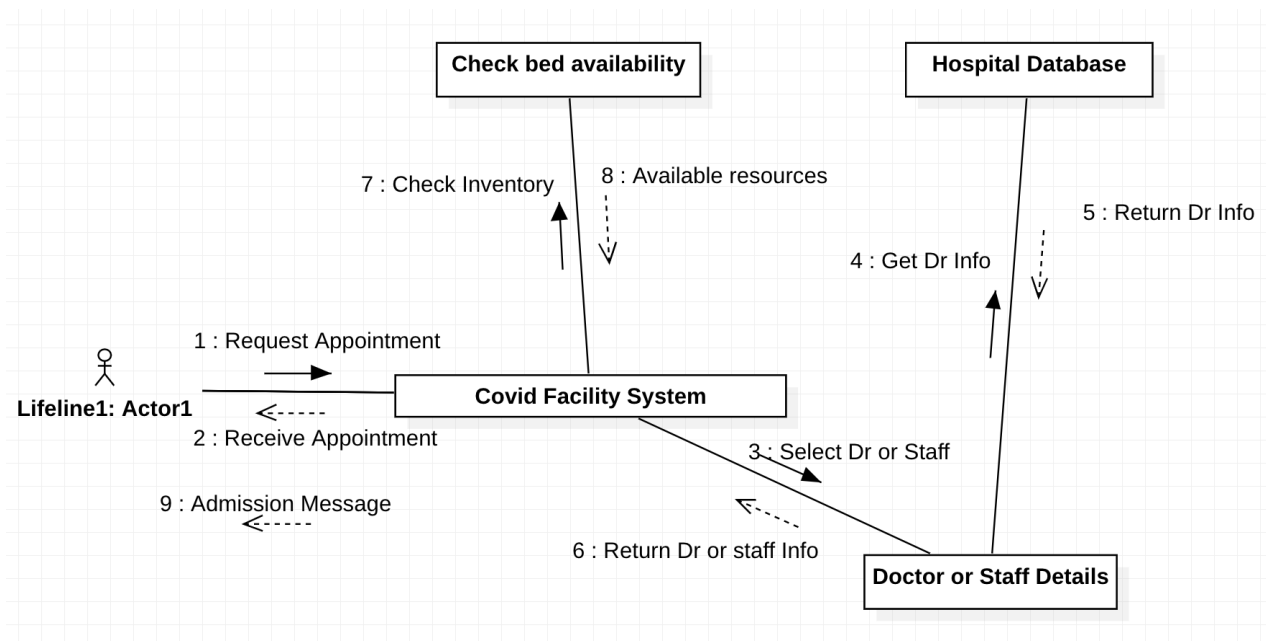
Aim: Create the Collaboration Diagram for A Covid Facility Management System

Software Used: Star UML

Theory: A collaboration/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:



Experiment-12

Aim: Create the Deployment Diagram for A Covid Facility 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. They're commonly used to depict a system's physical hardware and software. It may be used to figure out how the system will be physically installed on the hardware. 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:

