Internal Assessment (Mandatory Experiment) Sheet for Lab Experiment
Department of Computer Science & Engineering
Amity University, Noida (UP)

Programme	B. Tech CSE	Course Name	Software Engineering
Course Code	[IT-301]	Semester	6
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Marking Criteria

Criteria	Total Marks	Marks Obtained	Comments
Concept (A)	2		
Implementation (B)	2		
Performance (C)	2		
Total	6		

Lab File

Software Engineering
[IT-301]

DEPARTMENT
OF
COMPUTER SCIENCE AND ENGINEERING

BACHELOR OF TECHNOLOGY
IN
COMPUTER SCIENCE AND ENGINEERING

Smart Inventory Management System

Submitted To:

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EXPERIMENT-1

Date: 09/01/2023

Objective: To formulate the problem statement for **Hospital Management System.**

HOSPITAL MANAGEMENT SYSTEM

Problem Statement:
Hospital management system is a computer system that helps manage the information related to health care and aids in the job completion of health care providers effectively. They manage the data related to all departments of healthcare such as,

- Clinical
- Financial
- Laboratory
- Inpatient
- Outpatient
- Operation theatre
- Materials
- Nursing
- Pharmaceutical
- Radiology
- Pathology etc.

HMS came into the picture of hospital management as early as 1960 and have ever since been evolving and synchronizing with the technologies while modernizing healthcare facilities. In today's world, the management of healthcare starts from the hands of the patients through their mobile phones and facilitates the needs of the patient.

Why is HMS important for a hospital?

HMS was introduced to solve the complications coming from managing all the paper works of every patient associated with the various departments of hospitalization with confidentiality. HMS provides the ability to manage all the paperwork in one place, reducing the work of staff in arranging and analysing the paperwork of the patients. HMS does many works like:

- Maintain the medical records of the patient
- Maintain the contact details of the patient
- Keep track of the appointment dates
- Save the insurance information for later reference
- Tracking the bill payments.

The advantages of HMS can be pinpointed to the following:

- Time-saving Technology
- Improved Efficiency by avoiding human errors
- Reduces scope for Error
- Data security and correct data retrieval made possible
- Cost effective and easily manageable
- Easy access to patient data with correct patient history
- Improved patient care made possible

- Easy monitoring of supplies in inventory
- Reduces the work of documentation
- Better Audit controls and policy compliance.

Features of Hospital Management System:

Appointment Management
For hospitals having their own site, appointment widgets will be integrated onto the site. Patients visiting the hospital's website can book online appointments with ease.

Billing Management
Integrated Billing with treatments, Lab and Radiology. Alerts will be sent on Discount Authorisation. Automatic due capture, Option to bill before and after consultation.

Prescription Management
Manage commonly and recently used medicines. Option to show medicines available in the pharmacy. SMS prescriptions to patients.

Discharge Summary
Template based Discharge Summary. ICD10 integration. Option to prevent discharge summary till IP bill is closed.

Operation Theatre Management
Automatic notification can be sent to customers on test results. Lab notifications like email, SMS of the test reports sent from the Automated Lab notification module.

Pharmacy Management
Comprehensive Pharmacy Management handles stock, Prescription Integration, Ward Request, Stock Management, Stock Moment and intelligent reports.

Lab Management
Comprehensive Lab Management handles complete order management, Custom Reports, Smart Notifications, Credit Settlement, detailed MIS Reports, Analytics and App for Phlebotomist.

Master Information Systems
Lets you access entire MIS data from your palm.

Manage Multiple Locations
Any number of branches can be added and managed using a single account.

EXPERIMENT 2

Date: 23/01/2023

Objective: Class Diagram in UML for Hospital Management System

Software Used: StarUML

Theory:

Class diagram is a static diagram. It represents the static view of an application. Class diagram is not only used for visualizing, describing, and documenting different aspects of a system but also for constructing executable code of the software application.

Class diagram describes the attributes and operations of a class and also the constraints imposed on the system. The class diagrams are widely used in the modelling of object-oriented systems because they are the only UML diagrams, which can be mapped directly with object-oriented languages.

Class diagram shows a collection of classes, interfaces, associations, collaborations, and constraints. It is also known as a structural diagram.

Purpose of Class Diagram:

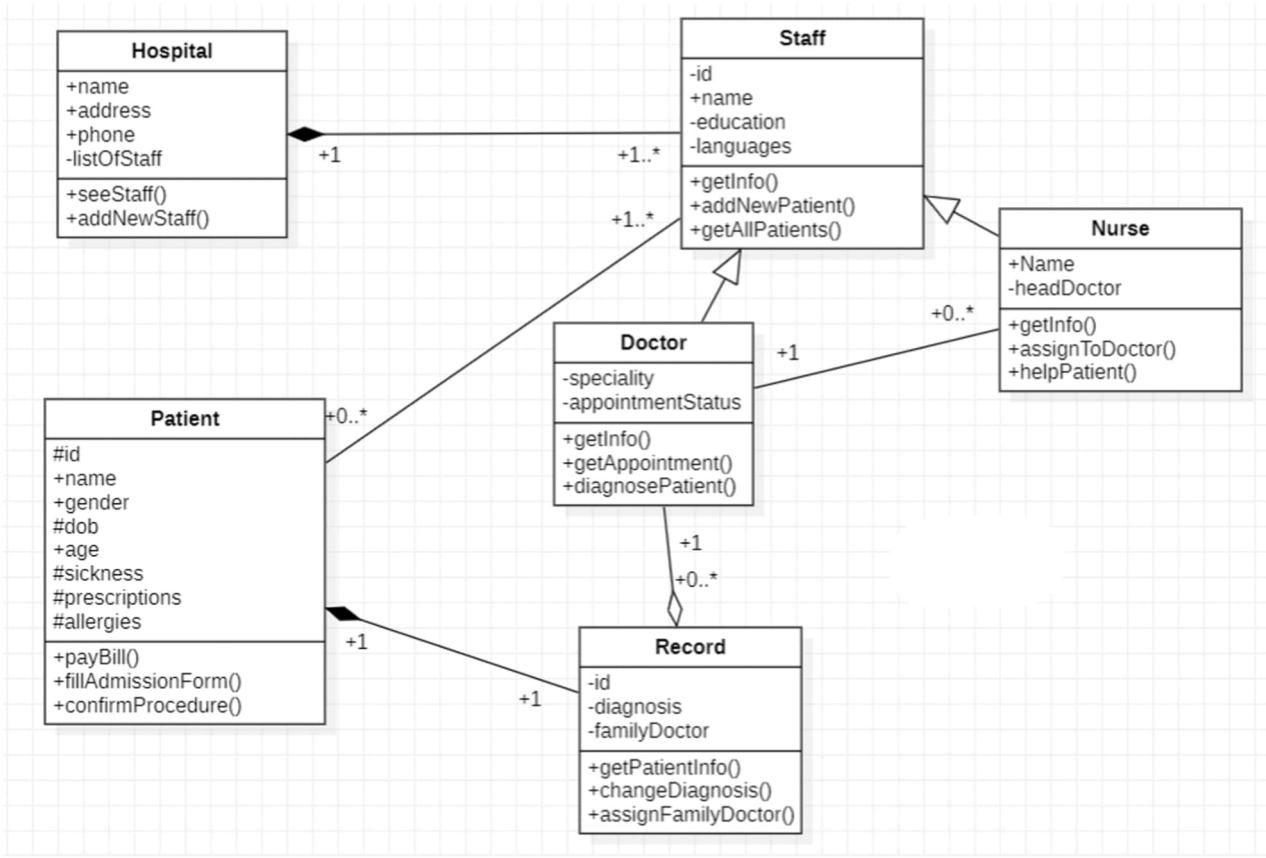
The purpose of class diagram is to model the static view of an application. Class diagrams are the only diagrams which can be directly mapped with object-oriented languages and thus widely used at the time of construction.

UML diagrams like activity diagram, sequence diagram can only give the sequence flow of the application, however class diagram is a bit different. It is the most popular UML diagram in the coder community.

The purpose of the class diagram can be summarized as −

- Analysis and design of the static view of an application.
- Describe responsibilities of a system.
- Base for component and deployment diagrams.
- Forward and reverse engineering.

UML Diagram:


Hospital
+name
+address
+phone
-listOfStaff
+seeStaff()
+addNewStaff()
Staff
-id
+name
-education
-languages
+getInfo()
+addNewPatient()
+getAllPatients()
Nurse
+Name
-headDoctor
+getInfo()
+assignToDoctor()
+helpPatient()
Doctor
-speciality
-appointmentStatus
+getInfo()
+getAppointment()
+diagnosePatient()
Patient
#id
+name
+gender
#dob
+age
#sickness
#prescriptions
#allergies
+payBill()
+fillAdmissionForm()
+confirmProcedure()
Record
-id
-diagnosis
-familyDoctor
+getPatientInfo()
+changeDiagnosis()
+assignFamilyDoctor()
+1
+1..*
+1..*
+0..*
+1
+0..*
+1
+0..*
+1
+1

EXPERIMENT 3

Date: 30/01/2023

Objective: Use Case Diagram in UML for Hospital Management System

Software Used: StarUML

Theory:

A use case diagram is used to represent the dynamic behaviour of a system. It encapsulates the system's functionality by incorporating use cases, actors, and their relationships. It models the tasks, services, and functions required by a system/subsystem of an application. It depicts the high-level functionality of a system and also tells how the user handles a system.

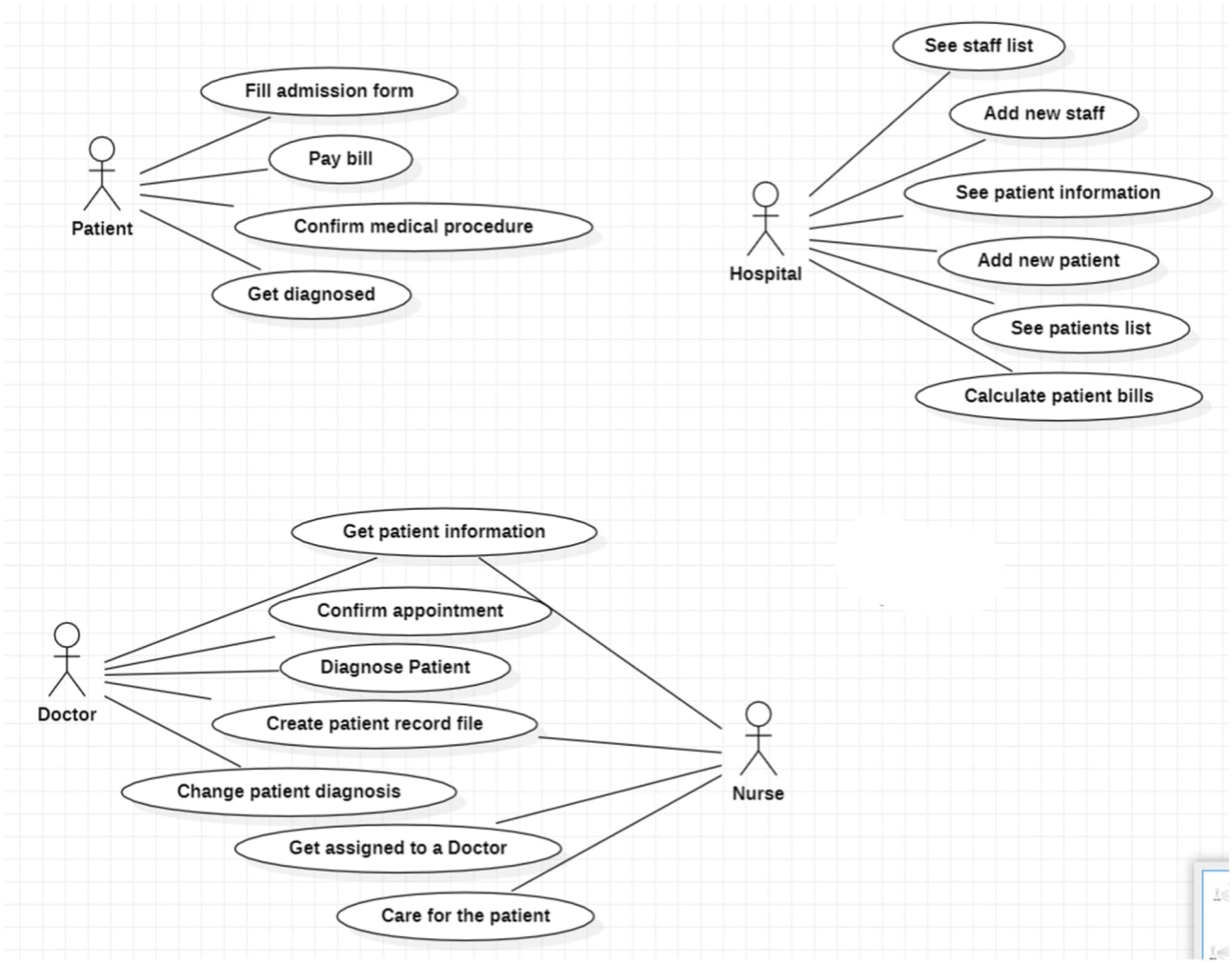
Purpose of Use Case Diagrams:

The main purpose of a use case diagram is to portray the dynamic aspect of a system. It accumulates the system's requirement, which includes both internal as well as external influences. It invokes persons, use cases, and several things that invoke the actors and elements accountable for the implementation of use case diagrams. It represents how an entity from the external environment can interact with a part of the system.

Following are the purposes of a use case diagram given below:

1. It gathers the system's needs.
2. It depicts the external view of the system.
3. It recognizes the internal as well as external factors that influence the system.
4. It represents the interaction between the actors.

UML Diagram:


Patient
Fill admission form
Pay bill
Confirm medical procedure
Get diagnosed
Hospital
See staff list
Add new staff
See patient information
Add new patient
See patients list
Calculate patient bills
Doctor
Get patient information
Confirm appointment
Diagnose Patient
Create patient record file
Change patient diagnosis
Get assigned to a Doctor
Care for the patient
Nurse

EXPERIMENT 4

Date: 06/02/2023

Objective: State Diagram in UML for Hospital Management System

Software Used: StarUML

Theory:

A state diagram is used to represent the condition of the system or part of the system at finite instances of time. It's a behavioral diagram and it represents the behavior using finite state transitions. State diagrams are also referred to as State machines and State-chart Diagrams. These terms are often used interchangeably.

So simply, a state diagram is used to model the dynamic behavior of a class in response to time and changing external stimuli. We can say that each and every class has a state but we don't model every class using State diagrams. We prefer to model the states with three or more states.

Purpose of State Diagrams:

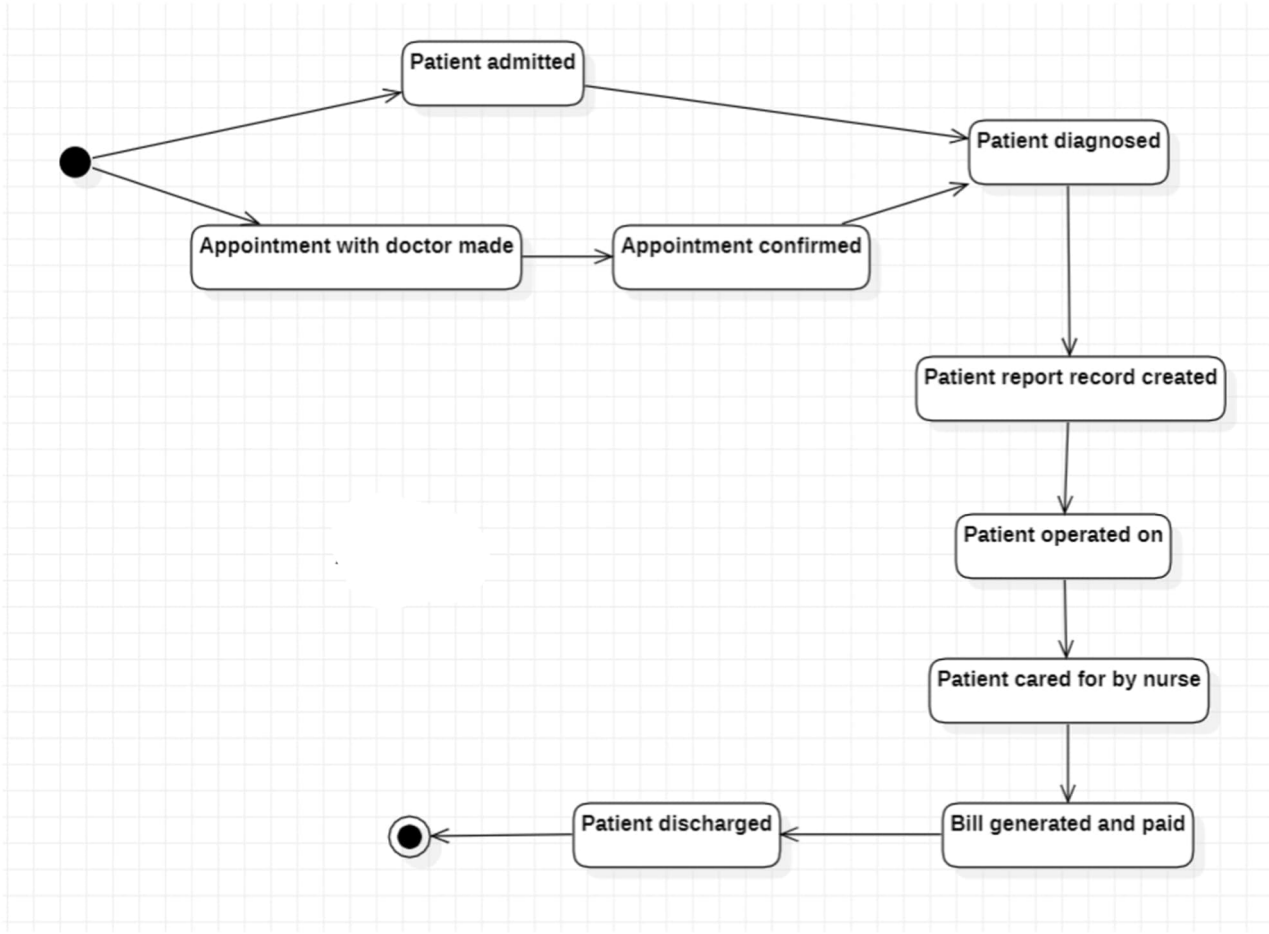
A state diagram is particularly useful in modeling complex systems, where it is necessary to understand the various states that an object can be in and the transitions between them. Some common examples where state diagrams are useful include:

1. Control systems: State diagrams are often used to model the behavior of control systems, where it is necessary to understand the various states that the system can be in and the transitions between them.

2. User interfaces: State diagrams can be used to model the behavior of user interfaces, where it is necessary to understand the various states that a user interface can be in and the events that cause it to transition between those states.

3. Communication protocols: State diagrams are often used to model the behavior of communication protocols, where it is necessary to understand the various states that the protocol can be in and the transitions between them.

UML Diagram:


Patient admitted
Patient diagnosed
Appointment with doctor made
Appointment confirmed
Patient report record created
Patient operated on
Patient cared for by nurse
Bill generated and paid
Patient discharged

EXPERIMENT 5

Date: 13/02/2023

Objective: Object Diagram in UML for Hospital Management System

Software Used: StarUML

Theory:

Object diagrams are dependent on the class diagram as they are derived from the class diagram. It represents an instance of a class diagram. The objects help in portraying a static view of an object-oriented system at a specific instant.

Both the object and class diagram are similar to some extent; the only difference is that the class diagram provides an abstract view of a system. It helps in visualizing a particular functionality of a system.

Purpose of Object Diagram:

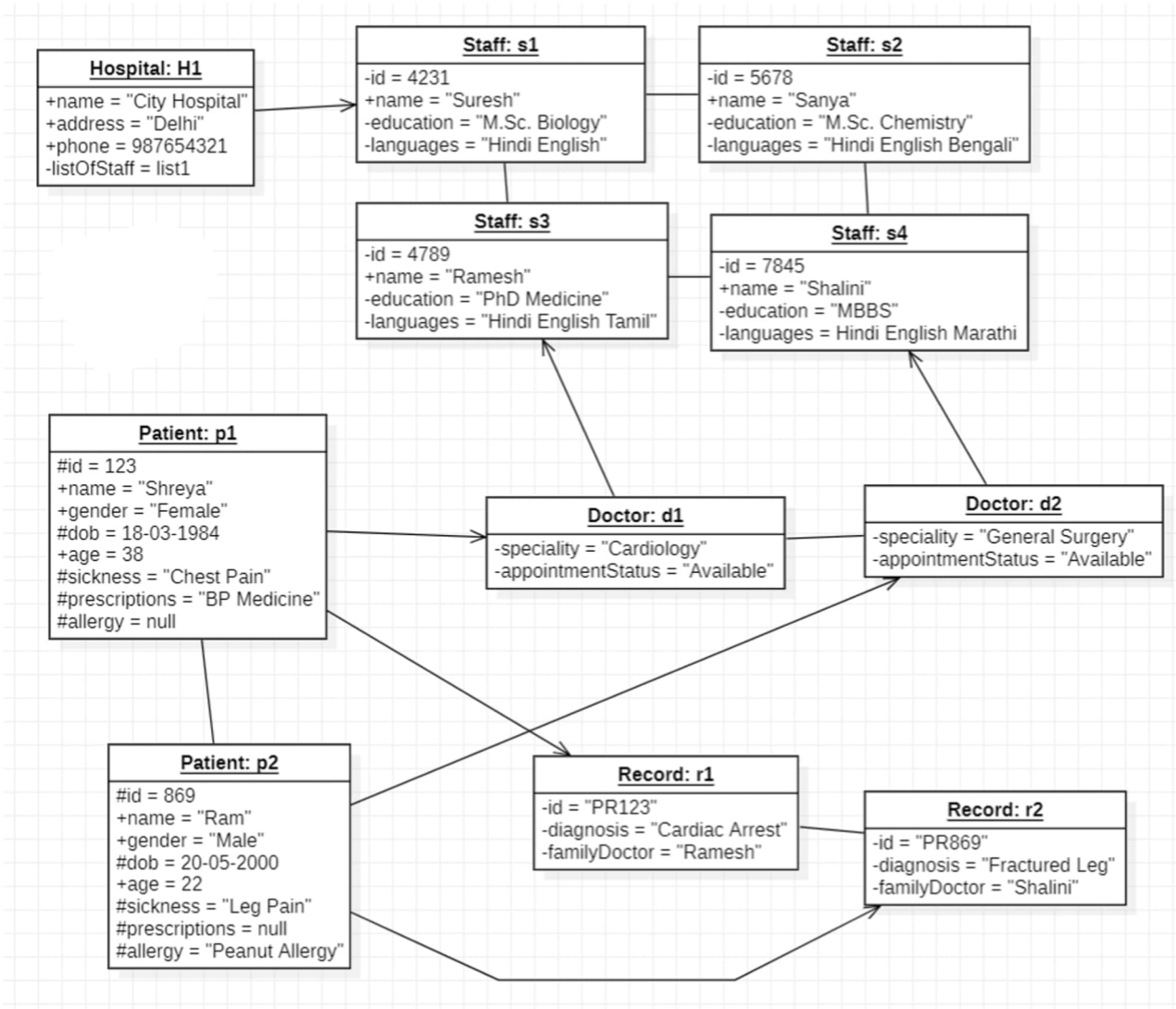
The object diagram holds the same purpose as that of a class diagram. The class diagram provides an abstract view which comprises of classes and their relationships, whereas the object diagram represents an instance at a particular point of time.

The object diagram is actually similar to the concrete (actual) system behavior. The main purpose is to depict a static view of a system.

Following are the purposes enlisted below:

1. It is used to perform forward and reverse engineering.
2. It is used to understand object behavior and their relationships practically.
3. It is used to get a static view of a system.
4. It is used to represent an instance of a system.

UML Diagram:


Hospital: H1
+name = "City Hospital"
+address = "Delhi"
+phone = 987654321
-listOfStaff = list1
Staff: s1
-id = 4231
+name = "Suresh"
-education = "M.Sc. Biology"
-languages = "Hindi English"
Staff: s2
-id = 5678
+name = "Sanya"
-education = "M.Sc. Chemistry"
-languages = "Hindi English Bengali"
Staff: s3
-id = 4789
+name = "Ramesh"
-education = "PhD Medicine"
-languages = "Hindi English Tamil"
Staff: s4
-id = 7845
+name = "Shalini"
-education = "MBBS"
-languages = Hindi English Marathi
Patient: p1
#id = 123
+name = "Shreya"
+gender = "Female"
#dob = 18-03-1984
+age = 38
#sickness = "Chest Pain"
#prescriptions = "BP Medicine"
#allergy = null
Doctor: d1
-speciality = "Cardiology"
-appointmentStatus = "Available"
Doctor: d2
-speciality = "General Surgery"
-appointmentStatus = "Available"
Patient: p2
#id = 869
+name = "Ram"
+gender = "Male"
#dob = 20-05-2000
+age = 22
#sickness = "Leg Pain"
#prescriptions = null
#allergy = "Peanut Allergy"
Record: r1
-id = "PR123"
-diagnosis = "Cardiac Arrest"
-familyDoctor = "Ramesh"
Record: r2
-id = "PR869"
-diagnosis = "Fractured Leg"
-familyDoctor = "Shalini"

EXPERIMENT 6

Date: 20/02/2023

Objective: Activity Diagram in UML for Hospital Management System

Software Used: StarUML

Theory:

Activity diagram is another important diagram in UML to describe the dynamic aspects of the system.

Activity diagram is basically a flowchart to represent the flow from one activity to another activity. The activity can be described as an operation of the system.

The control flow is drawn from one operation to another. This flow can be sequential, branched, or concurrent. Activity diagrams deal with all type of flow control by using different elements such as fork, join, etc.

Purpose of Activity Diagrams:

The basic purposes of activity diagrams are similar to other four diagrams. It captures the dynamic behavior of the system. Other four diagrams are used to show the message flow from one object to another but activity diagram is used to show message flow from one activity to another.

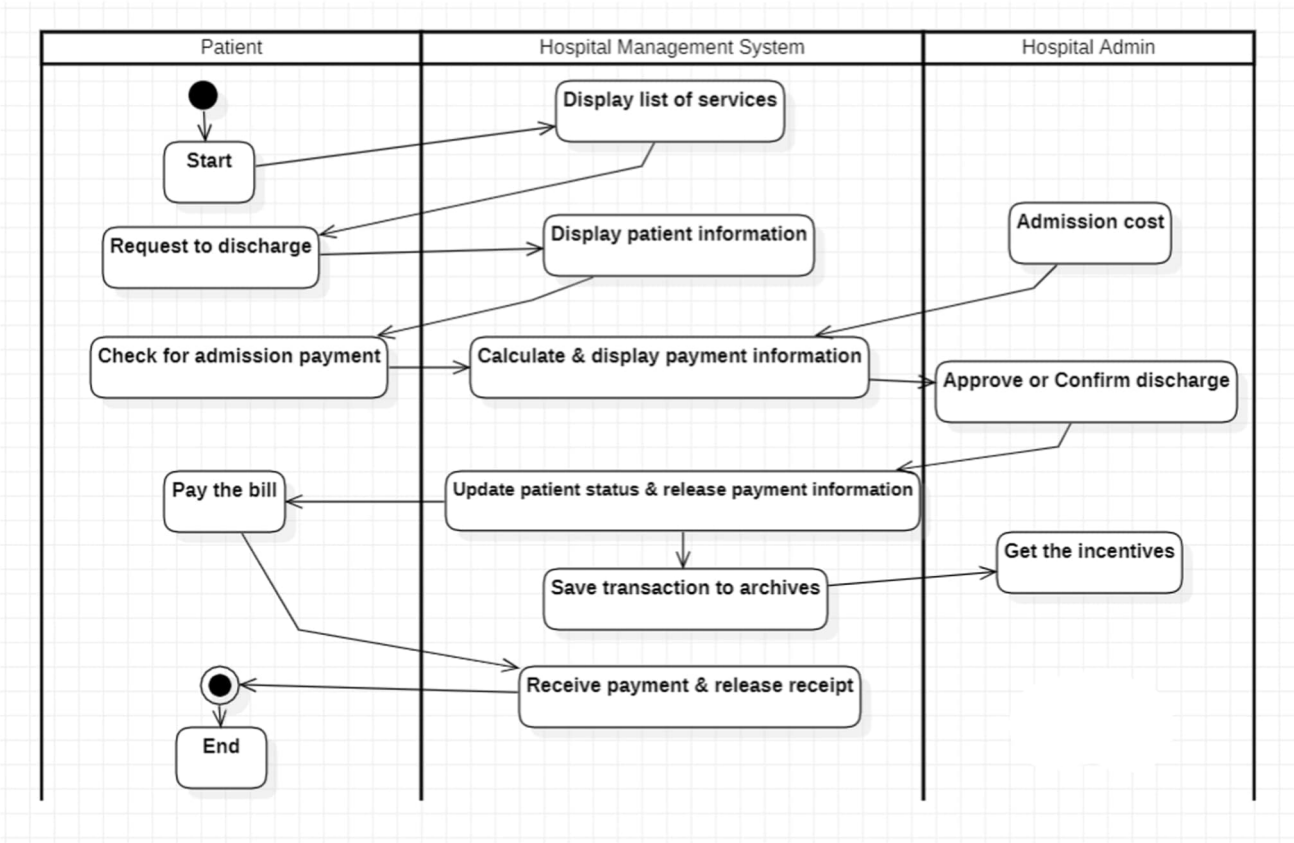
Activity is a particular operation of the system. Activity diagrams are not only used for visualizing the dynamic nature of a system, but they are also used to construct the executable system by using forward and reverse engineering techniques. The only missing thing in the activity diagram is the message part.

It does not show any message flow from one activity to another. Activity diagram is sometimes considered as the flowchart. Although the diagrams look like a flowchart, they are not. It shows different flows such as parallel, branched, concurrent, and single.

The purpose of an activity diagram can be described as −

1. Draw the activity flow of a system.
2. Describe the sequence from one activity to another.
3. Describe the parallel, branched and concurrent flow of the system

UML Diagram:


Patient
Hospital Management System
Hospital Admin
Start
Display list of services
Request to discharge
Display patient information
Admission cost
Check for admission payment
Calculate & display payment information
Approve or Confirm discharge
Pay the bill
Update patient status & release payment information
Get the incentives
Save transaction to archives
Receive payment & release receipt
End