CONTENTS

ABSTRACT

Description:

New technologies have improved the ability of electronically storing, transferring and sharing medical data also changed. At the same time, they also create serious questions about who has access to this information and how they are protected. The aim of PIS is to store the detailed information about the Patient like treatment details, date of joining and allocated doctor. The major modules in this system are allocating the bed, allocating the doctor to the patient.

Features:

- Knowing the patient details and patient status
- To know the type of treatment he/ she undergoing.
- To know the consulted doctor details, his / her visiting hours.
- To know the information about the doctors included and deleted.
- It allows adding / editing patient registration.
- To know the list of doctors available
- To know the total list of beds available

INTRODUCTION

This software can be used to keep track of the patients registering in a hospital or clinic also, this system supports accessing the previous visit histories of any patient, search for patients by name and other properties etc. This system involves three people's patient, doctor and receptionist. It is useful to know the details of consulted doctor details and status of patient who is undergoing treatment under this doctor. To know the treatment details provided by the doctor.

Patient has registered with the system automatically admitted into the hospital. After login we can know the patient details by patient id. Then they come to know the patient status by doctor and bed.

And third and most important member in this system is Receptionist. He is the administrator of the system. He / she can add or delete the doctor and bed. He allocates the bed and doctor to the patient. And also he edits and updates the details of the doctor and bed in the system.

Features:

- This is totally intranet based system. It maintains the records of patients from starting.
- To view the case sheet of patient and details of doctor and bed..
- Knowing the previous histories of patients
- To know the patient status by doctor and bed
- To know the details doctors are in the floor.

- Allocation details of doctors and beds.

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SYSTEM:

- Designing and implementing the new links.
- Designing and implementing the users.
- Arranging new links as subject wise.

SYSTEM ANALYSIS:

System analysis will be performed to determine if it is feasible to design information based on policies and plans of the organization and on user requirements and to eliminate the weaknesses of the present system.

- The new system should be cost effective.
- To augment management, improve productivity and services.
- To enhance user / system interface.
- To improve information qualify and usability.
- To upgrade systems reliability, availability, flexibility and growth potential.

Objectives of system

The proposed system is an attempt to provide a rich solution to know the details of patient, doctor and bed. The main aim of this system is simplify the procedure while admitting the hospital. This is makes life easy to the patient's relatives knowing the details of visiting doctor, bed, treatment details and other details. The implementations of

the above modules have evolved user- friendly computerized systems which are loved and cared by all.

Objective:-

- Patent Information System will support registering patients.
- Users of this software can search for patients by name, admission date, discharge date etc
- Users can view the previous visit histories of any patient
- System can maintain the list of doctors in the hospital
- Patient Information System can maintain the list of beds/rooms available in the hospital
- Patients can be categorised by in-patients and out-patients.
- The computerized system has enabled the medics to serve their customers with a smile and to meet the corporate objective set by the founder.

User Requirements:

1. User has to automatically register with the system after admitted in the hospital
2. User can view the status of treatment.
3. He can know information about the consulted doctor and details of occupied bed
4. He can retrieve of reference data by online (For example printing the case sheet at the admission) reduces the patient admit time.

5. On request test result print / re print facility eliminated the patient waiting time for report collection.
6. On-line scheduling for appointment by doctors eliminated the patient waiting time.
7. Instant billing facility improved customer service while admitting and discharging from the hospital.
8. In this system User will have all facilities like regular hospital.

HARDWARE & SOFTWARE SPECIFICATIONS

3.1 HARDWARE REQUIREMENTS:

Processor	:	Intel P-IV system
Processor Speed	:	250MHz to 833MHz
RAM	:	512MB RAM
Hard Disk	:	40GB

3.2 SOFTWARE REQUIREMENTS:

Operating System	:	Windows XP
Database	:	Sql Server

Server side technology	:	ASP.Net
Server side scripting	:	ASP
Client side scripting	:	HTML
Web-Server	:	IIS

4.1 Software Implementation

Microsoft.NET Framework

The .NET Framework is a new computing platform that simplifies application development in the highly distributed environment of the Internet. The .NET Framework is designed to fulfill the following objectives:

- To provide a consistent object-oriented programming environment whether object code is stored and executed locally, executed locally but Internet-distributed, or executed remotely.
- To make the developer experience consistent across widely varying types of applications, such as Windows-based applications and Web-based applications.
- To build all communication on industry standards to ensure that code based on the .NET Framework can integrate with any other code.

The .NET Framework has two main components: the common language runtime and the .NET Framework class library. The common language runtime is the foundation of the .NET Framework. You can think of the runtime as an agent that manages code at

execution time, providing core services such as memory management, thread management, and remoting, while also enforcing strict type safety and other forms of code accuracy that ensure security and robustness. In fact, the concept of code management is a fundamental principle of the runtime. Code that targets the runtime is known as managed code, while code that does not target the runtime is known

unmanaged code. The class library, the other main component of the .NET Framework, is a comprehensive, object-oriented collection of reusable types that you can use to develop applications ranging from traditional command-line or graphical user interface (GUI) applications to applications based on the latest innovations provided by ASP.NET, such as Web Forms and XML Web services.

Features of the Common Language Runtime

The common language runtime manages memory, thread execution, code execution, code safety verification, compilation, and other system services. These features are intrinsic to the managed code that runs on the common language runtime.

The runtime also enforces code robustness by implementing a strict type- and code-verification infrastructure called the common type system (CTS). The CTS ensures

that all managed code is self-describing. The various Microsoft and third-party language compilers

Generate managed code that conforms to the CTS. This means that managed code can consume other managed types and instances, while strictly enforcing type fidelity and type safety.

.NET Framework Class Library

The .NET Framework class library is a collection of reusable types that tightly integrate with the common language runtime. The class library is object oriented, providing types from which your own managed code can derive functionality. This not only makes the .NET Framework types easy to use, but also reduces the time associated with learning new features of the .NET Framework. In addition, third-party components can integrate seamlessly with classes in the .NET Framework.

For example, the .NET Framework collection classes implement a set of interfaces that you can use to develop your own collection classes. Your collection classes will blend seamlessly with the classes in the .NET Framework.

For example, you can use the .NET Framework to develop the following types of applications and services:

- Console applications.

- Scripted or hosted applications.
- Windows GUI applications (Windows Forms).
- ASP.NET applications.
- XML Web services.
- Windows services.

SQL SERVER

DATABASE

A database management, or DBMS, gives the user access to their data and helps them transform the data into information. Such database management systems include dBase, paradox, IMS, Sql Server and SQL Server. These systems allow users to create, update and extract information from their database.

A database is a structured collection of data. Data refers to the characteristics of people, things and events. SQL Server stores each data item in its own fields. In SQL Server, the fields relating to a particular person, thing or event are bundled together to form a single complete unit of data, called a record (it can also be referred to as raw or an

occurrence). Each record is made up of a number of fields. No two fields in a record can have the same field name.

SQL Server Tables

SQL Server stores records relating to each other in a table. Different tables are created for the various groups of information. Related tables are grouped together to form a database.

Advantages of RDBMS

- Redundancy can be avoided
- Inconsistency can be eliminated
- Data can be Shared
- Standards can be enforced
- Security restrictions ca be applied
- Integrity can be maintained
- Conflicting requirements can be balanced
- Data independence can be achieved.

Disadvantages of DBMS

A significant disadvantage of the DBMS system is cost. In addition to the cost of purchasing of developing the software, the hardware has to be upgraded to allow for the

extensive programs and the workspace required for their execution and storage. While centralization reduces duplication, the lack of duplication requires that the database be adequately backed up so that in case of failure the data can be recovered.

FEATURES OF SQL SERVER (RDBMS)

SQL SERVER is one of the leading database management systems (DBMS) because it is the only Database that meets the uncompromising requirements of today's most demanding information systems. From complex decision support systems (DSS) to the most rigorous online transaction processing (OLTP) application, even application that require simultaneous DSS and OLTP access to the same critical data, SQL Server leads the industry in both performance and capability.

5.3. About UML:

Unified Modeling Language:

The Unified Modeling Language allows the software engineer to express an analysis model using the modeling notation that is governed by a set of syntactic semantic and pragmatic rules.

A UML system is represented using five different views that describe the system from distinctly different perspective. Each view is defined by a set of diagram, which is as follows

.

- User Model View
- Structural model view
- Behavioral Model View
- Implementation Model View
- Environmental Model View

5.4 UML DIAGRAMS

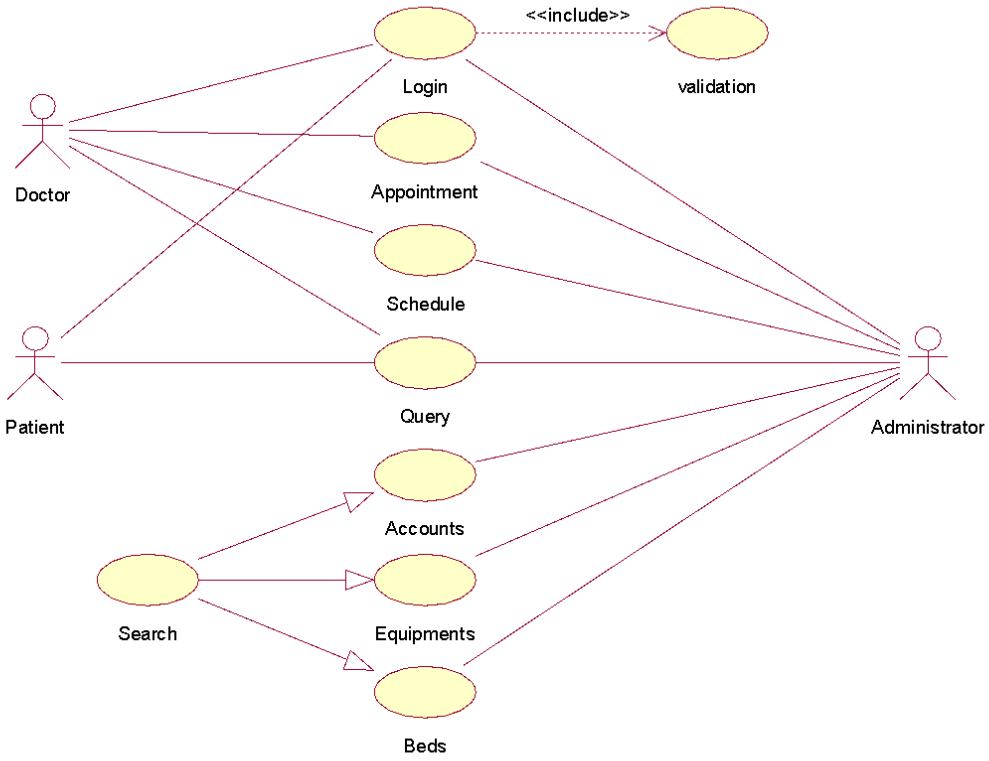
USE CASE DIAGRAM

- A use case diagram is a diagram that shows a set of use cases and actors and relationships.

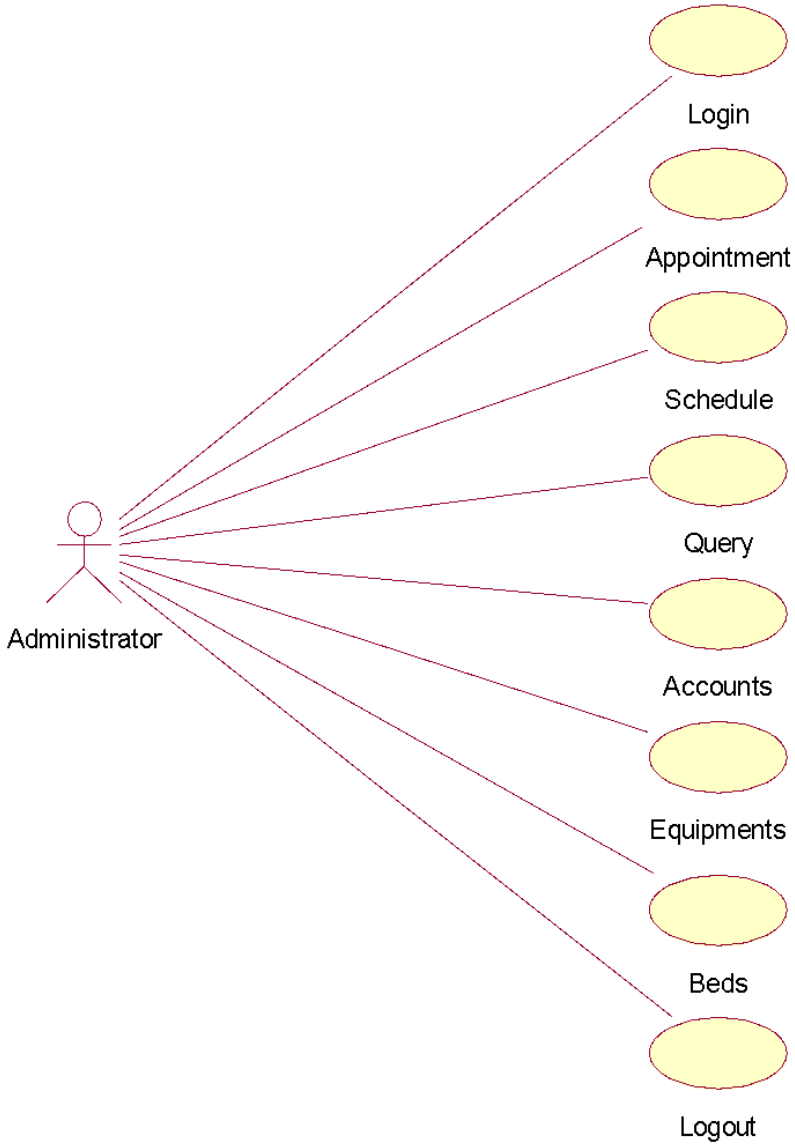
Contents

- Use case commonly contain
  - Use cases
  - Actors
  - Dependency, generalization and association relationships

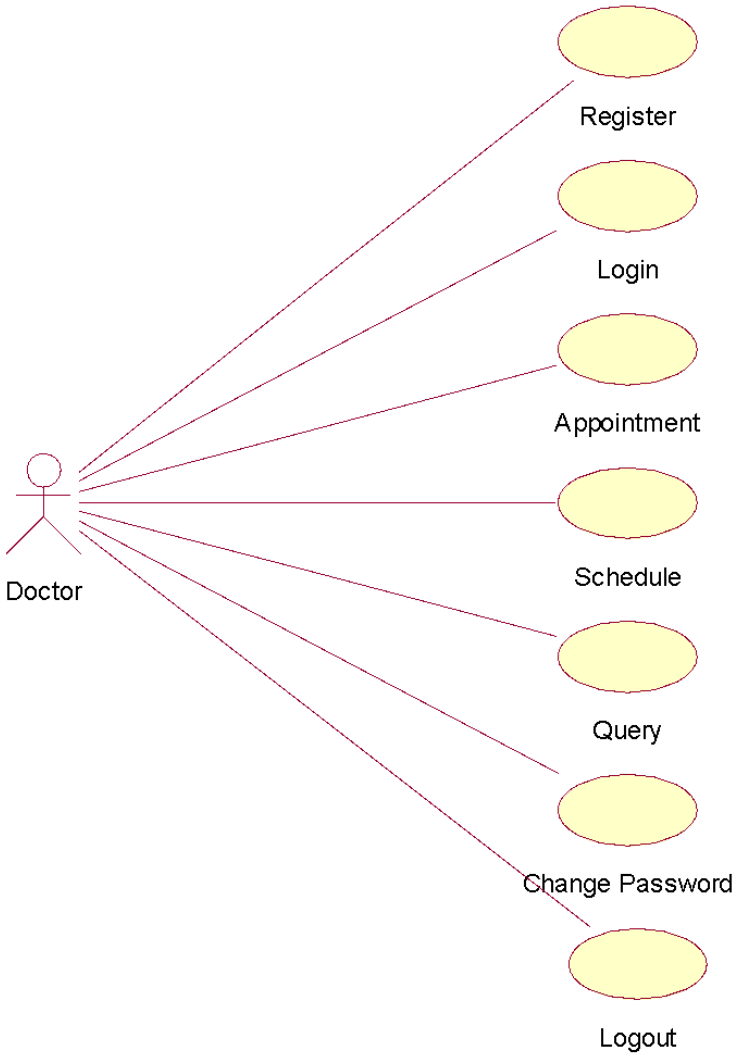
Over all Use Case



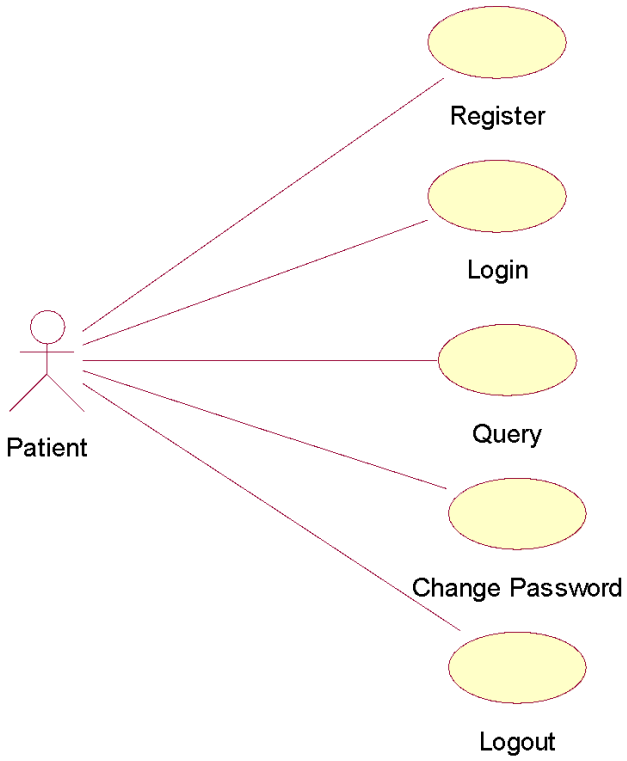
Administrator Use Case



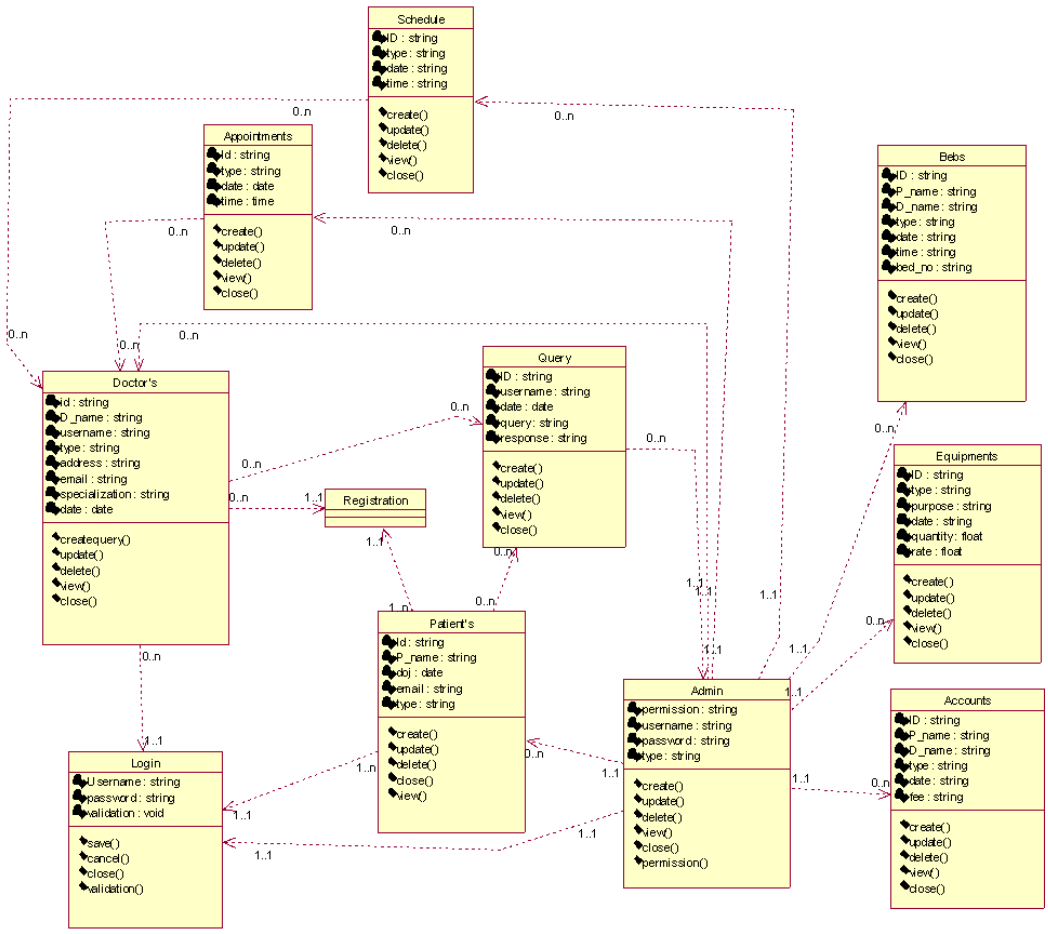
Doctor Use Case


Register
Login
Appointment
Doctor
Schedule
Query
Change Password
Logout

Patient Use Case



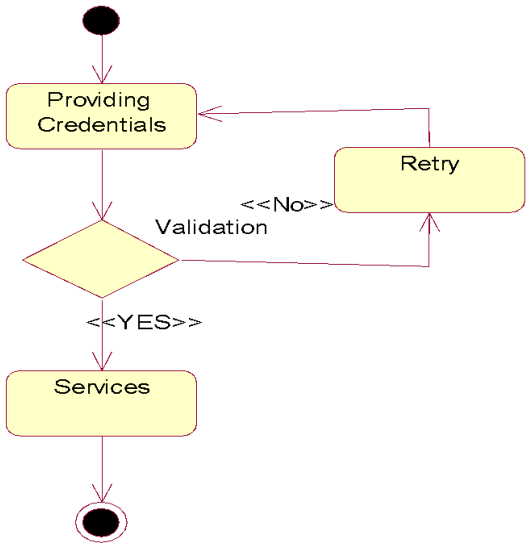
Class Diagram



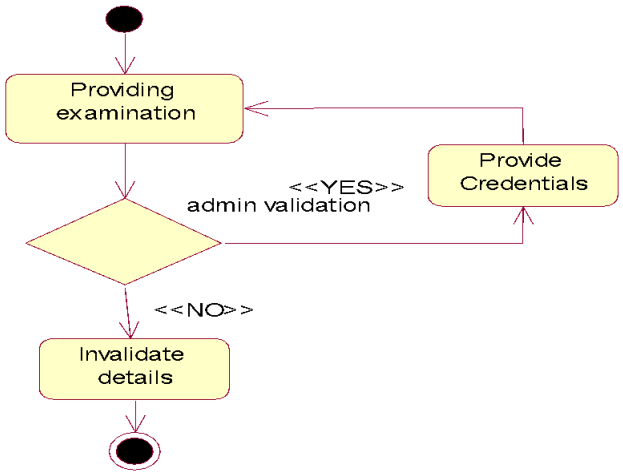
ACTIVITY DIAGRAM:

- An activity diagram shows the flow from activity to activity. An activity is an ongoing non-atomic execution within a state machine.
  - Activity states and action states
  - Transitions
  - Objects

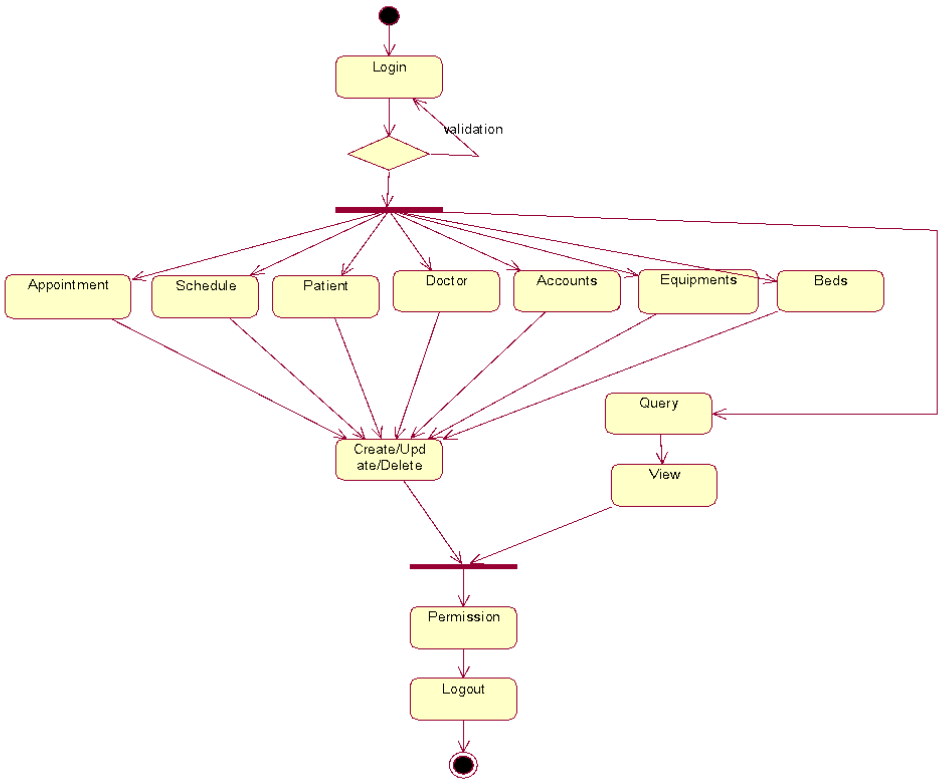
Login Process



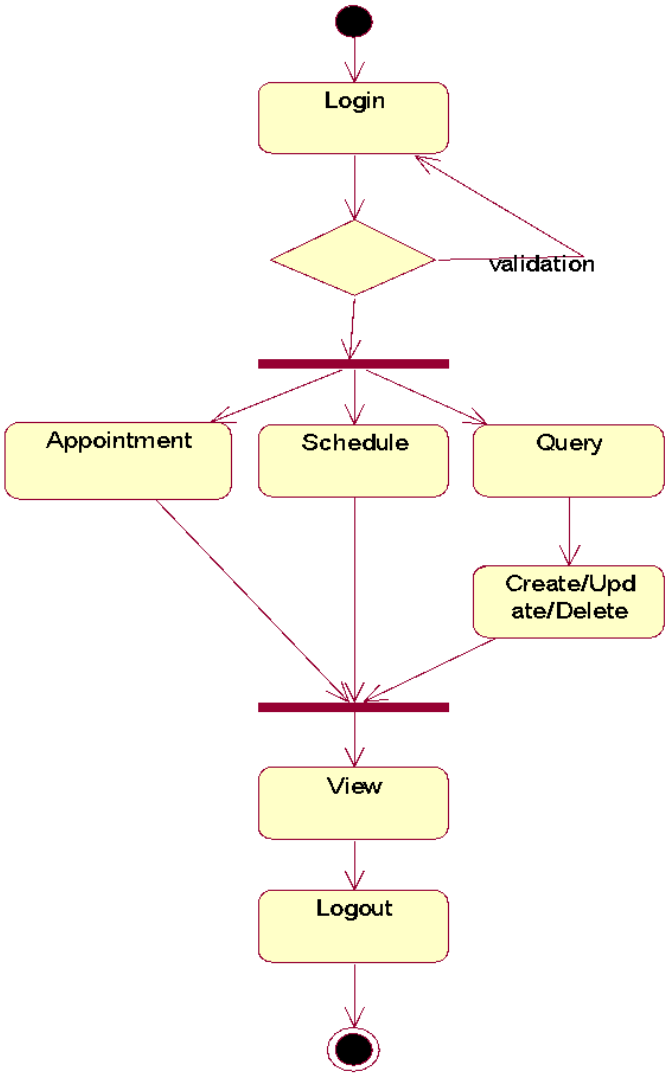
Registration Process


Providing examination
Provide Credentials
<<YES>>
admin validation
<<NO>>
Invalidate details

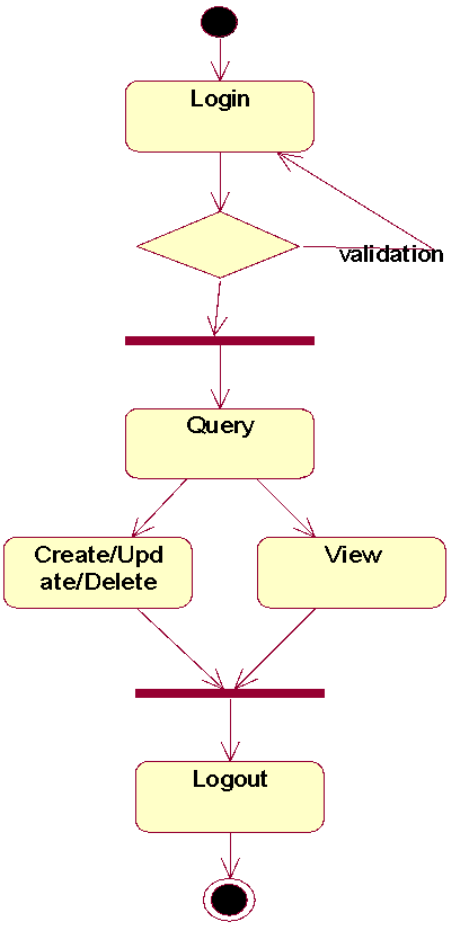
Administrator Process



Doctor Process


Login
validation
Appointment
Schedule
Query
Create/Upd
ate/Delete
View
Logout

Patient Process



SEQUENCE DIAGRAM

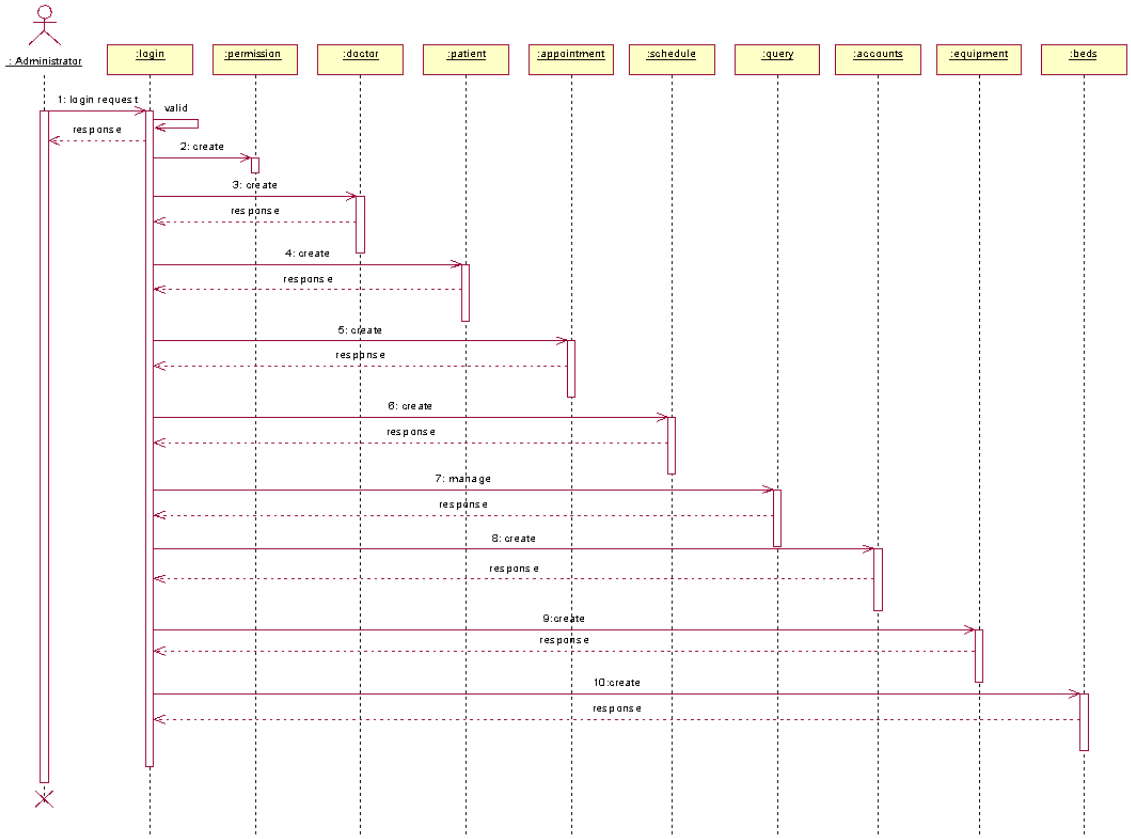
- An interaction diagram shows an interaction, consisting of a set of objects and their relationships, including the messages that may be dispatched among them.
- A sequence diagram is an interaction diagram that emphasizes the time ordering of messages.
- Graphically, a sequence diagram is a table that shows objects arranged along x-axis and messages, ordered in increasing time, along the y-axis.

Contents

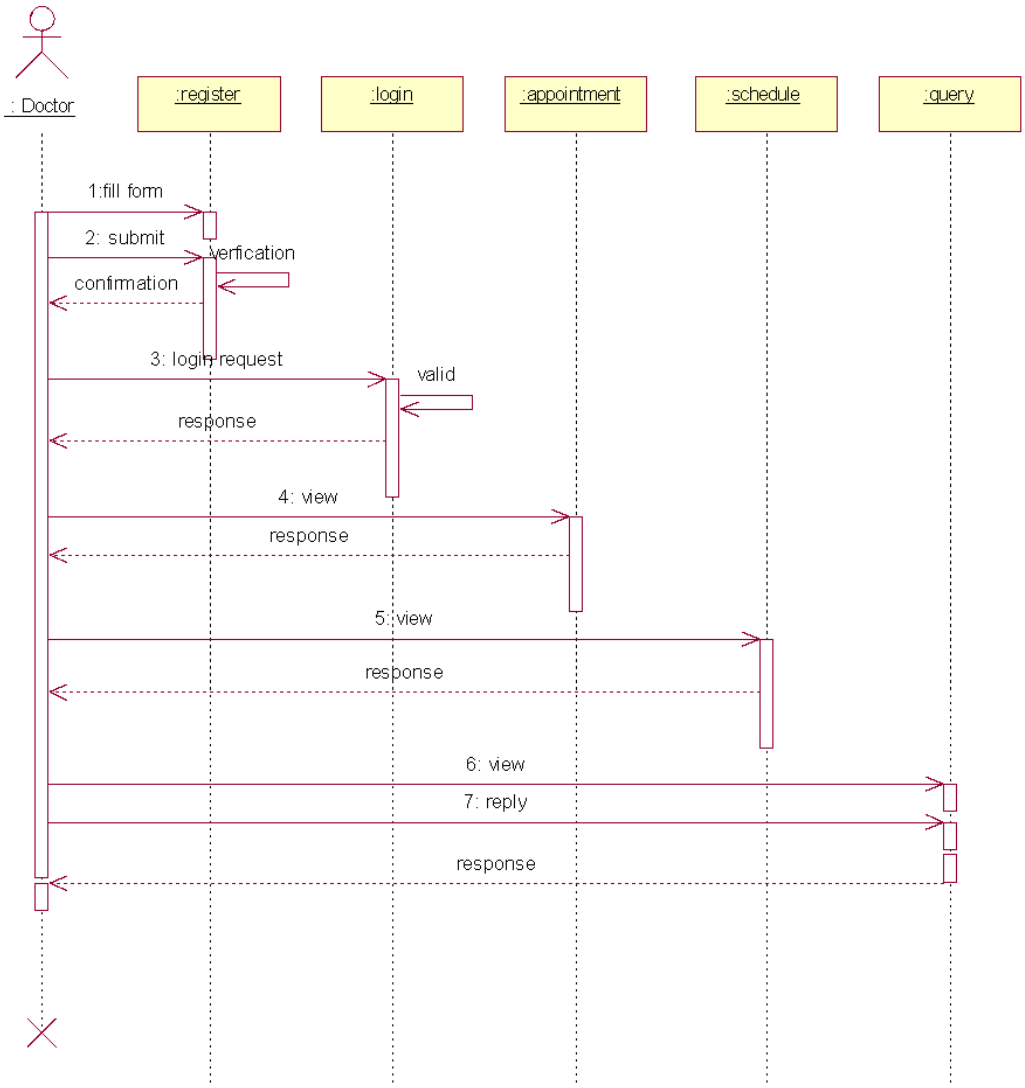
- Sequence diagrams commonly contain the following:
    - Objects
    - Links
    - Messages

Like all other diagrams, sequence diagrams may contain notes and constrains.

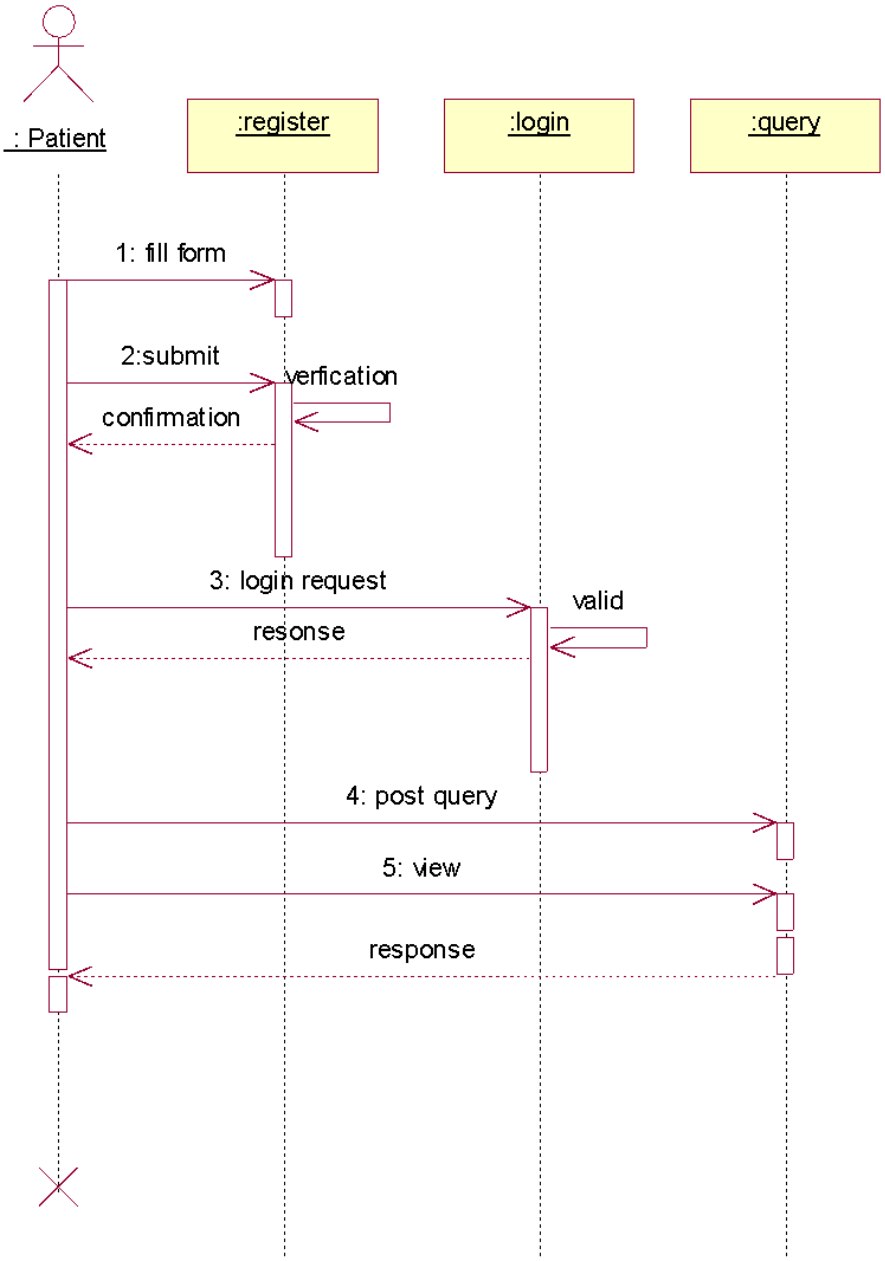
Administrator Sequence



Doctor Sequence


: Doctor
:register
:login
:appointment
:schedule
:query
1:fill form
2: submit
verfication
confirmation
3: login request
valid
response
4: view
response
5: view
response
6: view
7: reply
response

Patient Sequence



COLLABORATION DIAGRAM

- Collaboration is a society of classes, interfaces, and other elements that work together to provide some cooperative behavior that's bigger than the sum of all its parts.

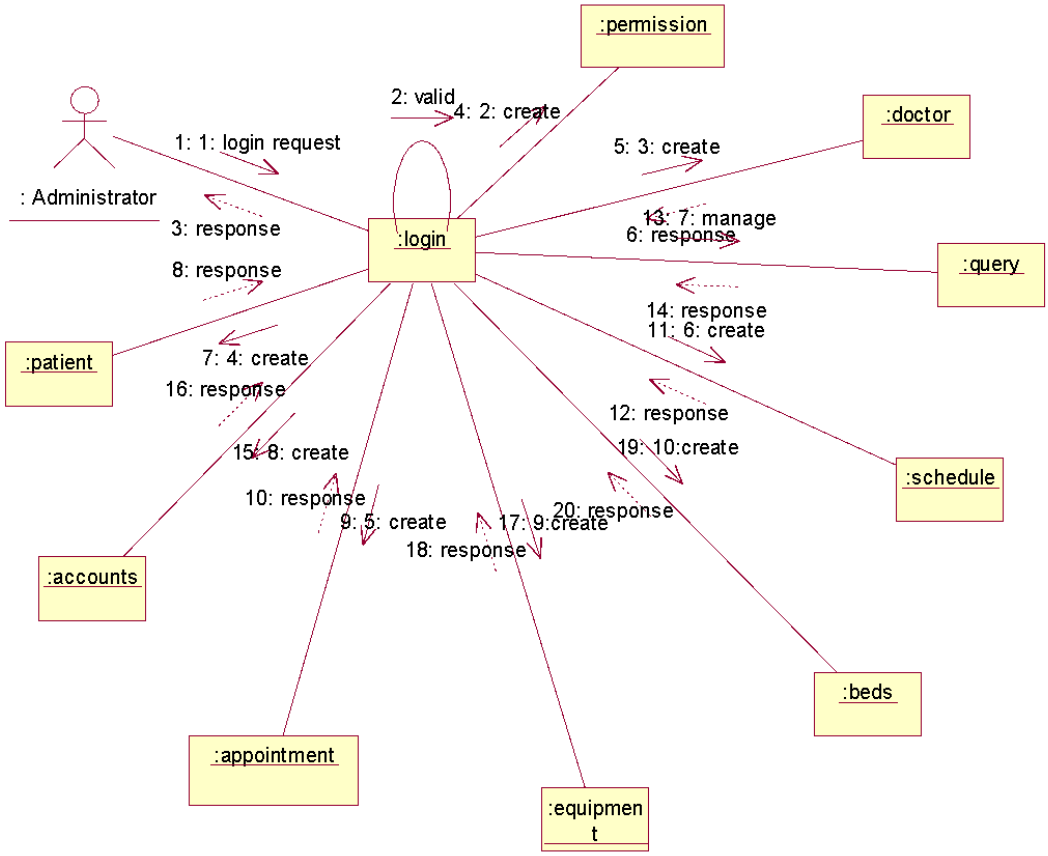
Contents

Collaboration diagrams commonly contain the following:

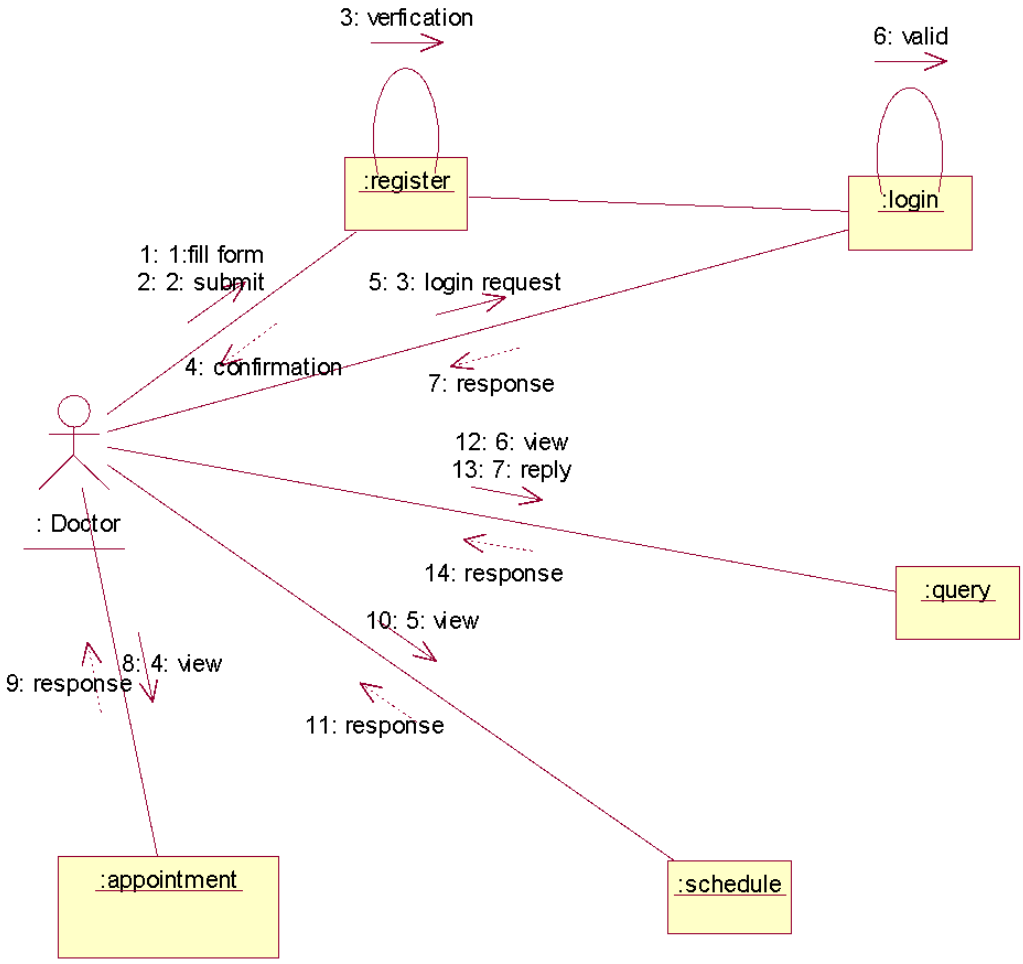
- Objects
- Links
- Messages

Like all other diagrams, sequence diagrams may contain notes and constrains.

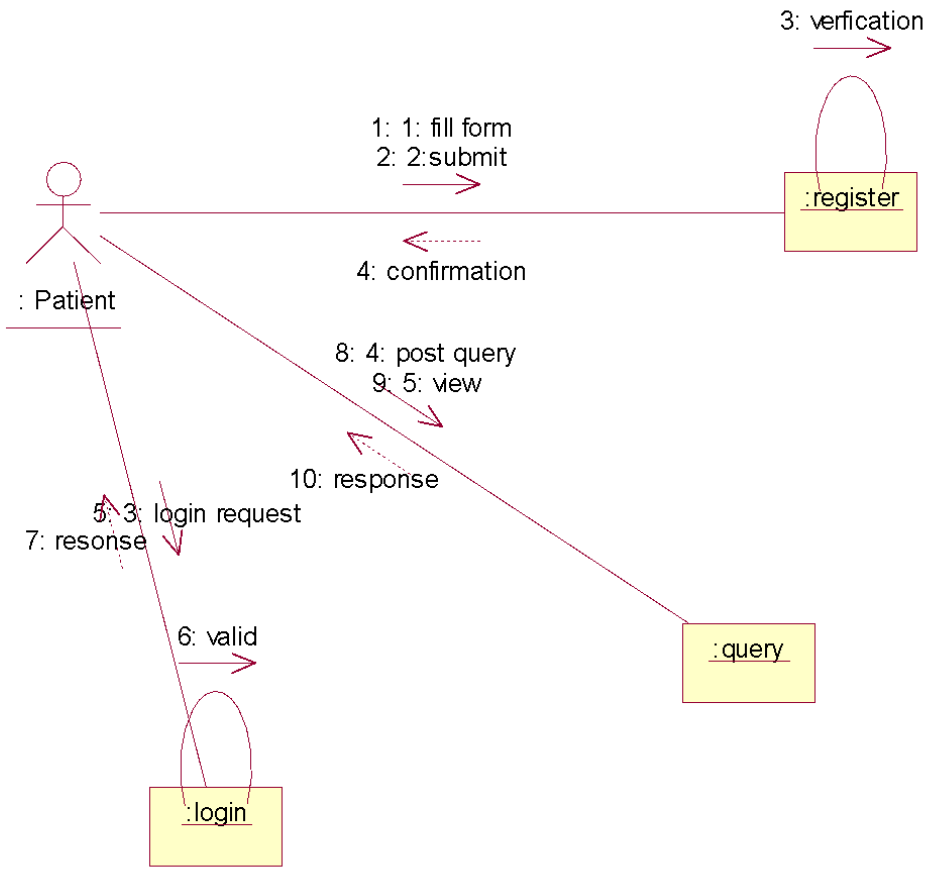
Administrator Collaboration



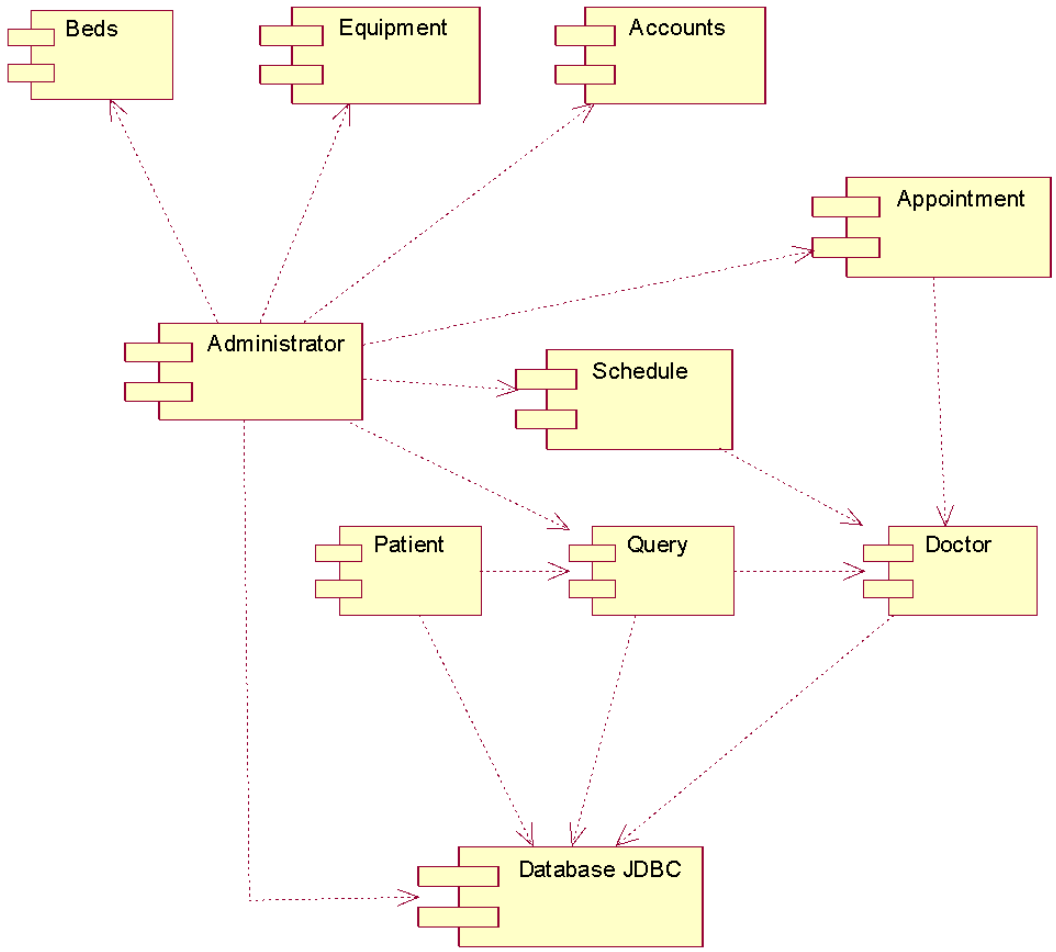
Doctor Collaboration


3: verfication
6: valid
:register
:login
1: 1:fill form
2: 2: submit
5: 3: login request
4: confirmation
7: response
12: 6: view
13: 7: reply
: Doctor
14: response
:query
10: 5: view
8: 4: view
9: response
11: response
:appointment
:schedule

Patient Collaboration



COMPONENT DIAGRAM

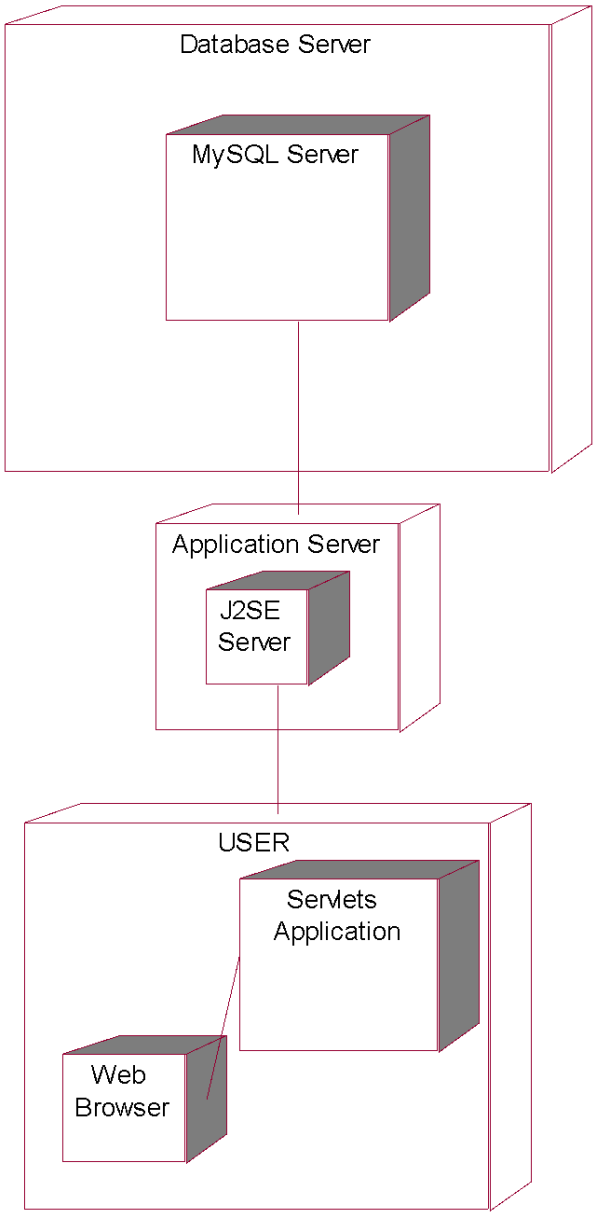


DEPLOYMENT DIAGRAM

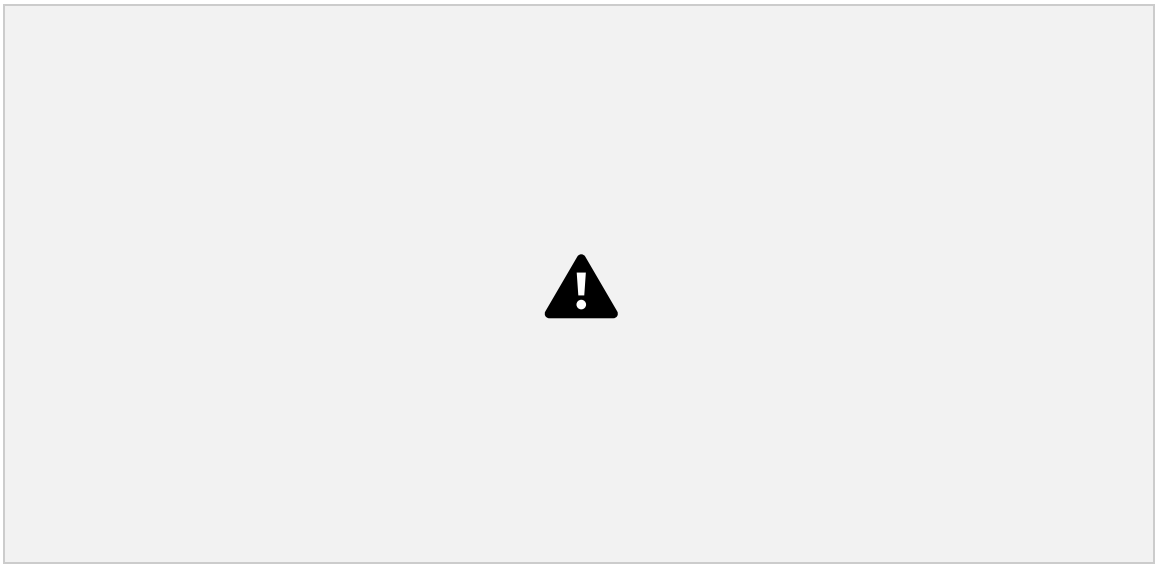
- A deployment diagram is a diagram that shows the configuration of run time processing nodes and the components that live on them.
- Graphically, a deployment diagram is collection of vertices and arcs.

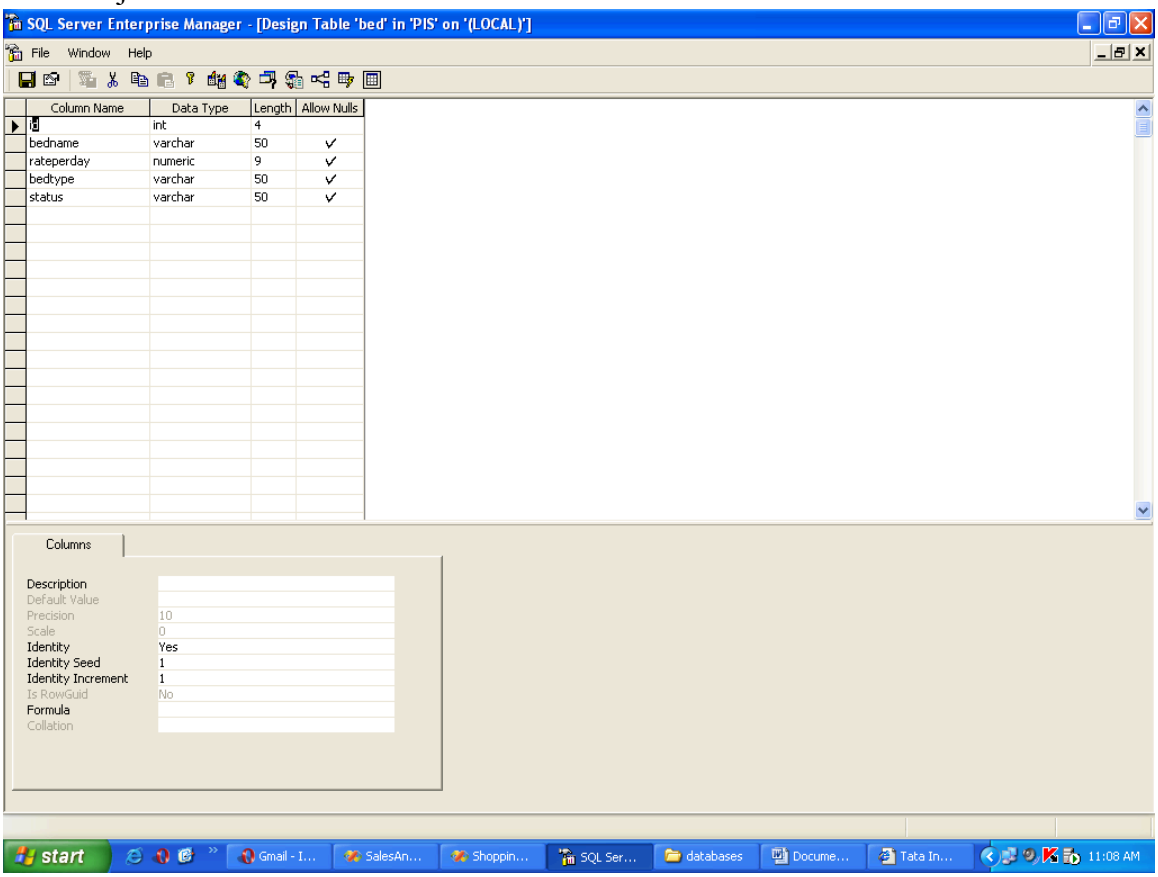
Contents

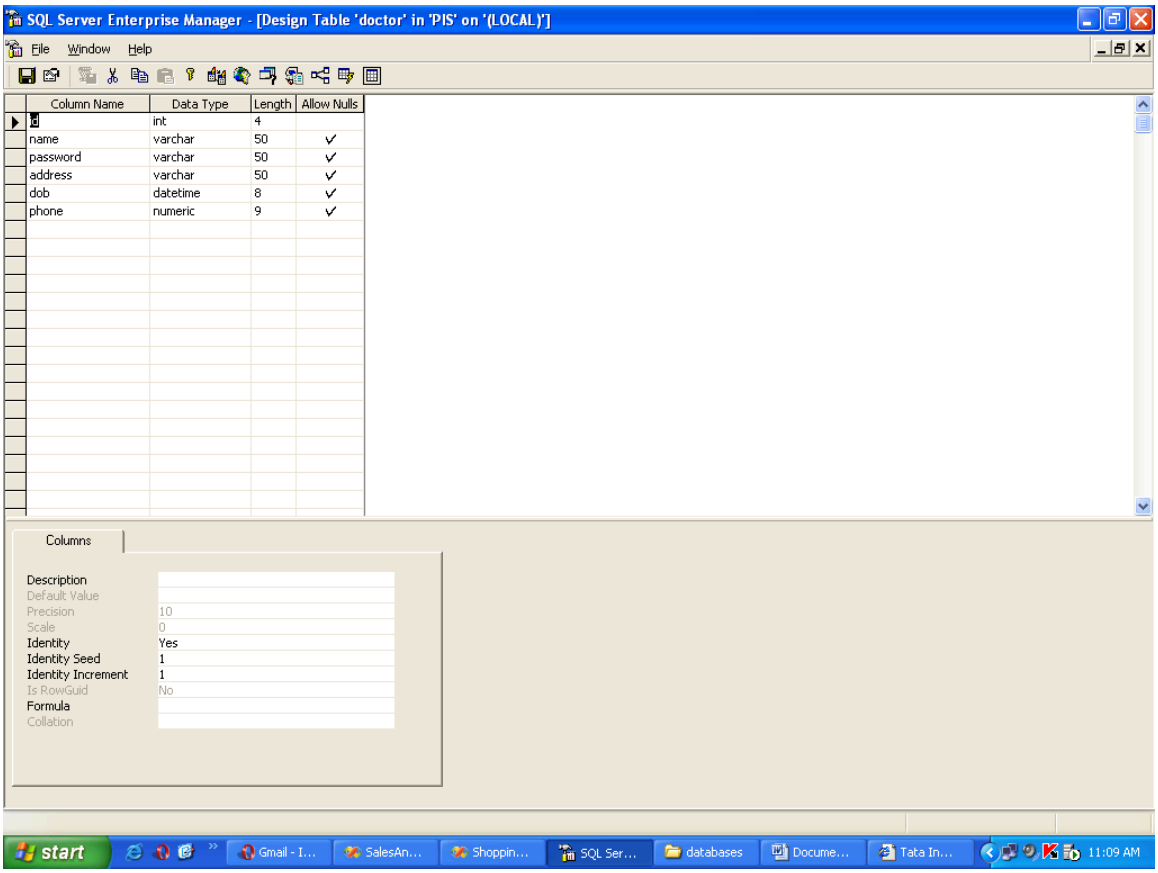
- Deployment diagram commonly contain the following things:
    - Nodes
    - Dependency and association relationships
- Like all other diagrams, deployment diagrams may contain notes and constraints.
- Deployment diagrams may also contain components, each of which must live on some node.
- Deployment diagrams may also contain packages or subsystems, both of which are used to group elements of your model into larger chunks.

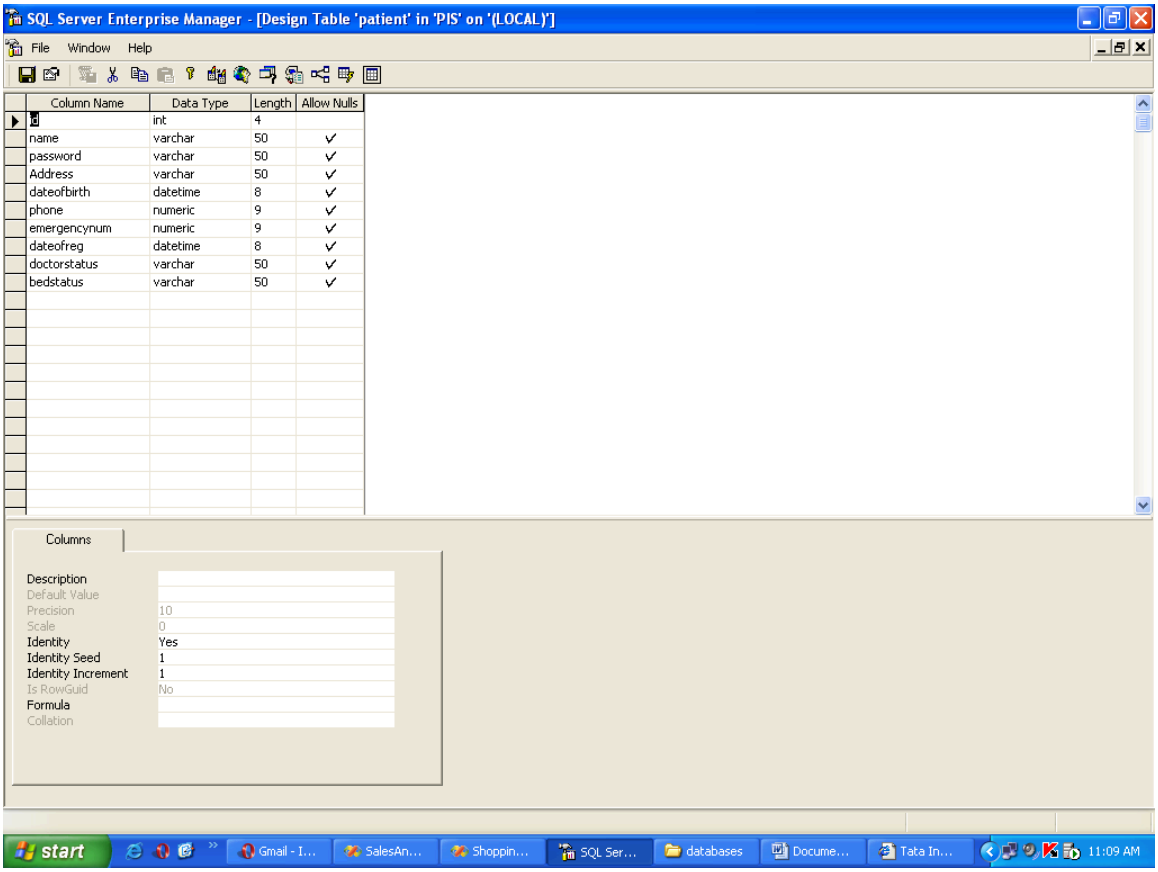

Database Server
MySQL Server
Application Server
J2SE
Server
USER
Servlets
Application
Web
Browser

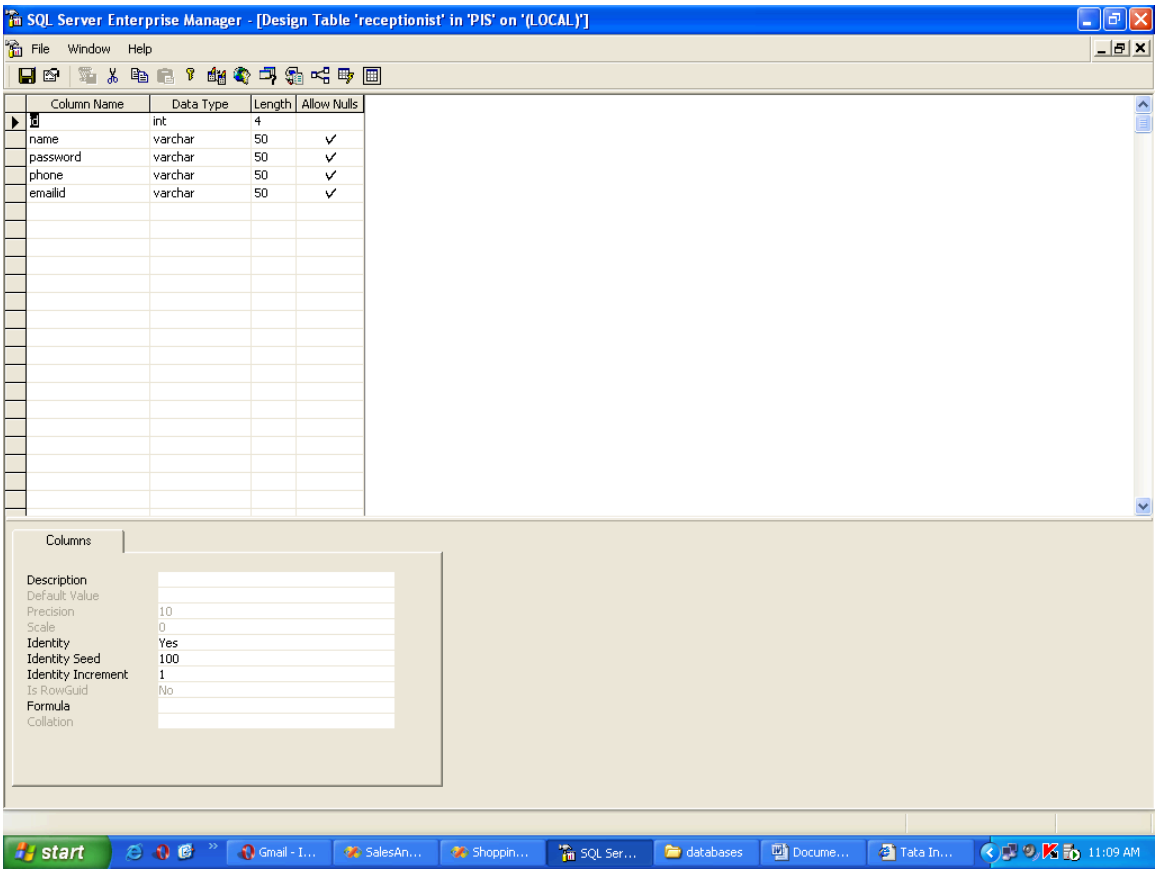
ER-Diagram

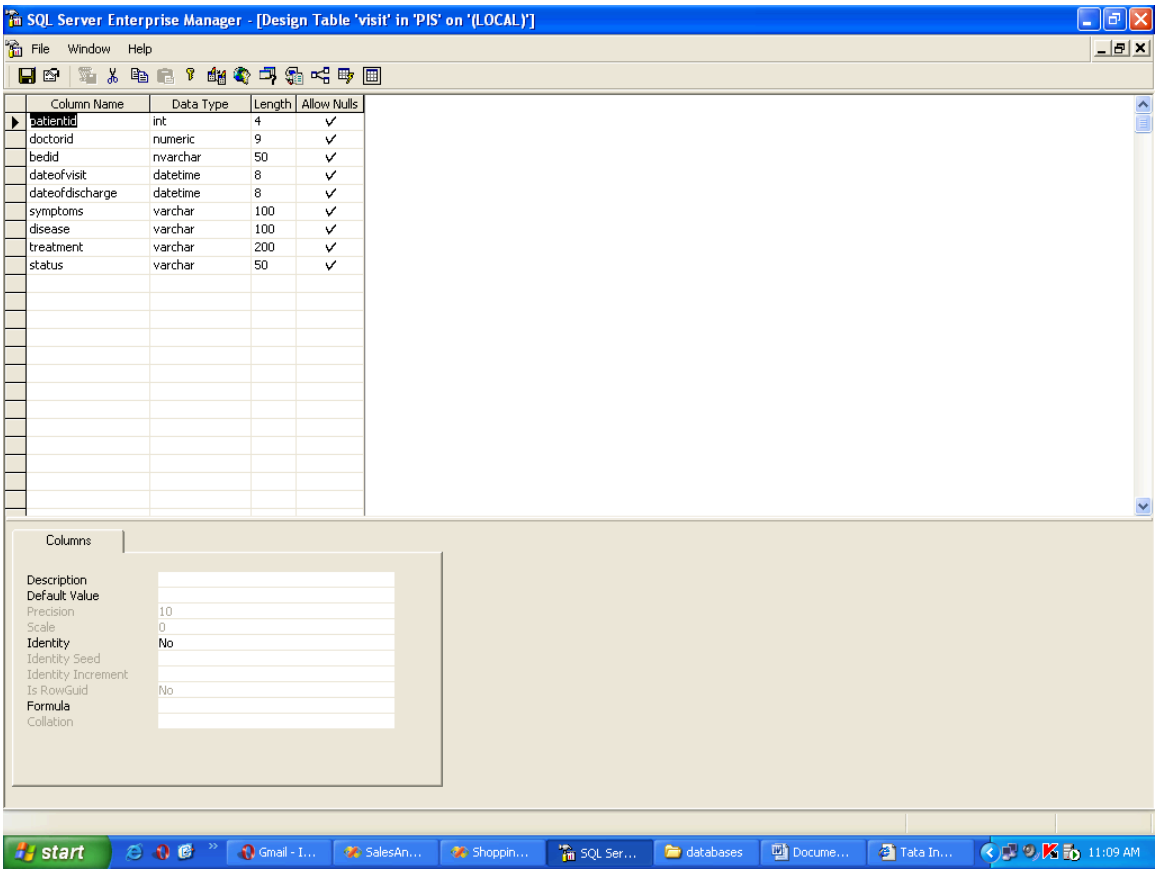



SQL Server Enterprise Manager - [Design Table 'bed' in 'PIS' on '(LOCAL)']
File Window Help
Column Name Data Type Length Allow Nulls
int 4
bedname varchar 50 ✓
rateperday numeric 9 ✓
bedtype varchar 50 ✓
status varchar 50 ✓
Columns
Description
Default Value
Precision 10
Scale 0
Identity Yes
Identity Seed 1
Identity Increment 1
Is RowGuid No
Formula
Collation
start
Gmail - I...
SalesAn...
Shoppin...
SQL Ser...
databases
Docume...
Tata In...
11:08 AM

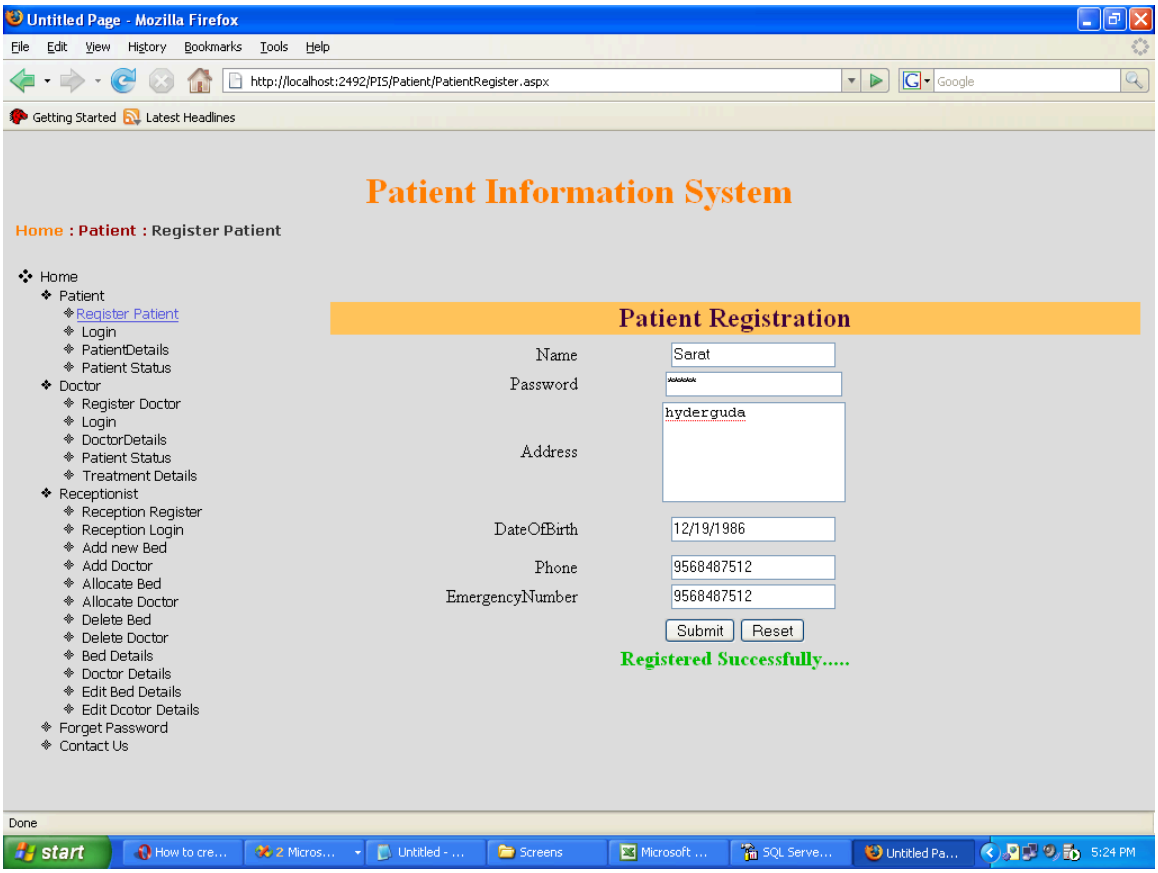

SQL Server Enterprise Manager - [Design Table 'doctor' in 'PIS' on '(LOCAL)']
File Window Help
Column Name Data Type Length Allow Nulls
int 4
name varchar 50
password varchar 50
address varchar 50
dob datetime 8
phone numeric 9
Columns
Description
Default Value
Precision 10
Scale 0
Identity Yes
Identity Seed 1
Identity Increment 1
Is RowGuid No
Formula
Collation
start
11:09 AM


SQL Server Enterprise Manager - [Design Table 'patient' in 'PIS' on '(LOCAL)']
File Window Help
Column Name Data Type Length Allow Nulls
int 4
name varchar 50
password varchar 50
Address varchar 50
dateofbirth datetime 8
phone numeric 9
emergencynum numeric 9
dateofreg datetime 8
doctorstatus varchar 50
bedstatus varchar 50
Columns
Description
Default Value
Precision 10
Scale 0
Identity Yes
Identity Seed 1
Identity Increment 1
Is RowGuid No
Formula
Collation
start
11:09 AM

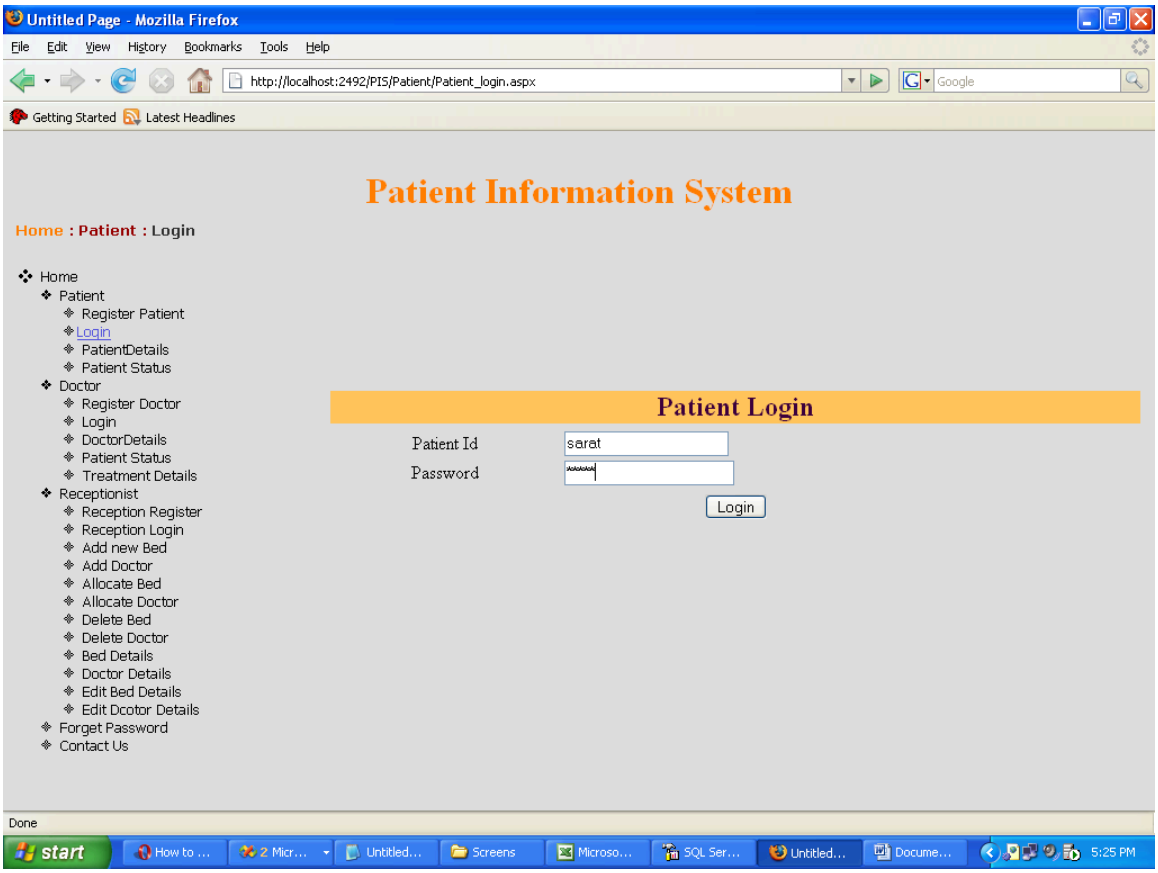

SQL Server Enterprise Manager - [Design Table 'receptionist' in 'PIS' on '(LOCAL)']
File Window Help
Column Name Data Type Length Allow Nulls
int 4
name varchar 50
password varchar 50
phone varchar 50
emailid varchar 50
Columns
Description
Default Value
Precision 10
Scale 0
Identity Yes
Identity Seed 100
Identity Increment 1
Is RowGuid No
Formula
Collation
start
11:09 AM


SQL Server Enterprise Manager - [Design Table 'visit' in 'PIS' on '(LOCAL)']
File Window Help
Column Name Data Type Length Allow Nulls
patientid int 4
doctorid numeric 9
bedid nvarchar 50
dateofvisit datetime 8
dateofdischarge datetime 8
symptoms varchar 100
disease varchar 100
treatment varchar 200
status varchar 50
Columns
Description
Default Value
Precision 10
Scale 0
Identity No
Identity Seed
Identity Increment
Is RowGuid No
Formula
Collation
start
11:09 AM

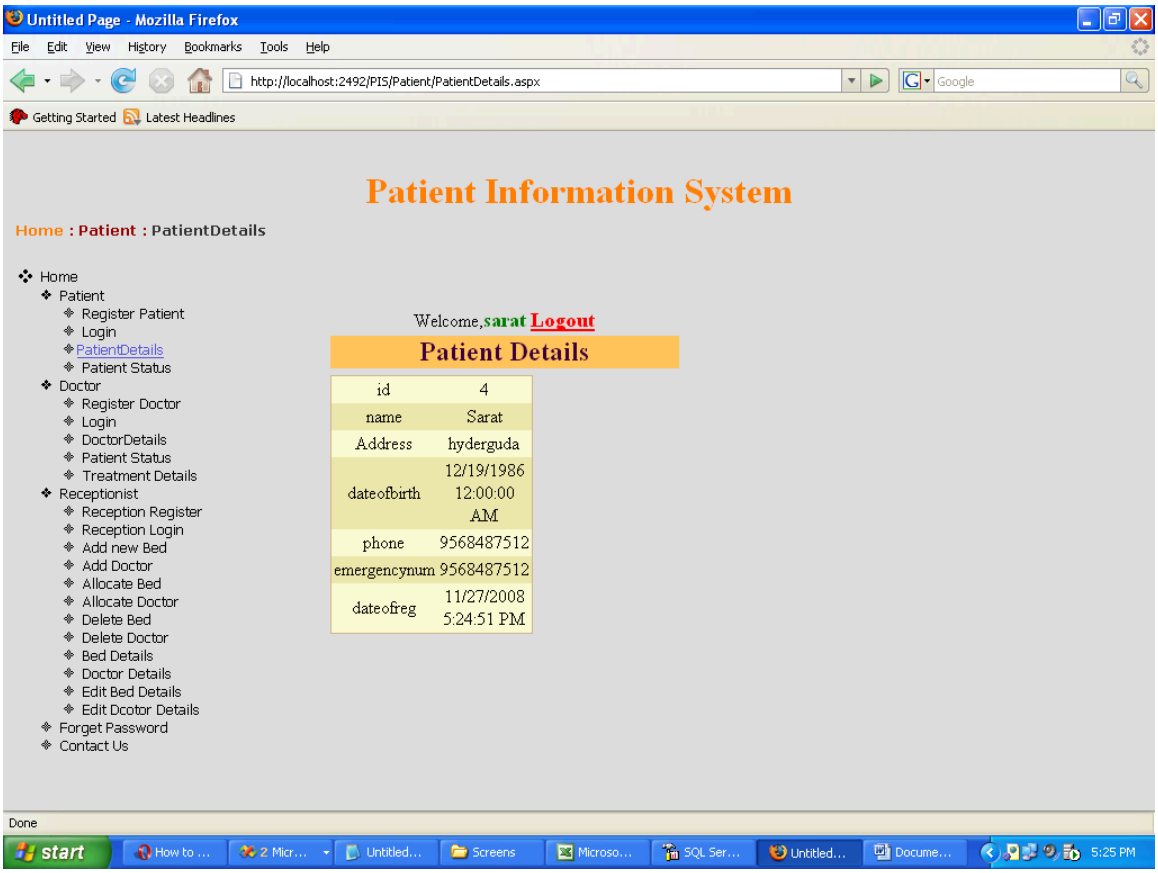
Patient Registration:



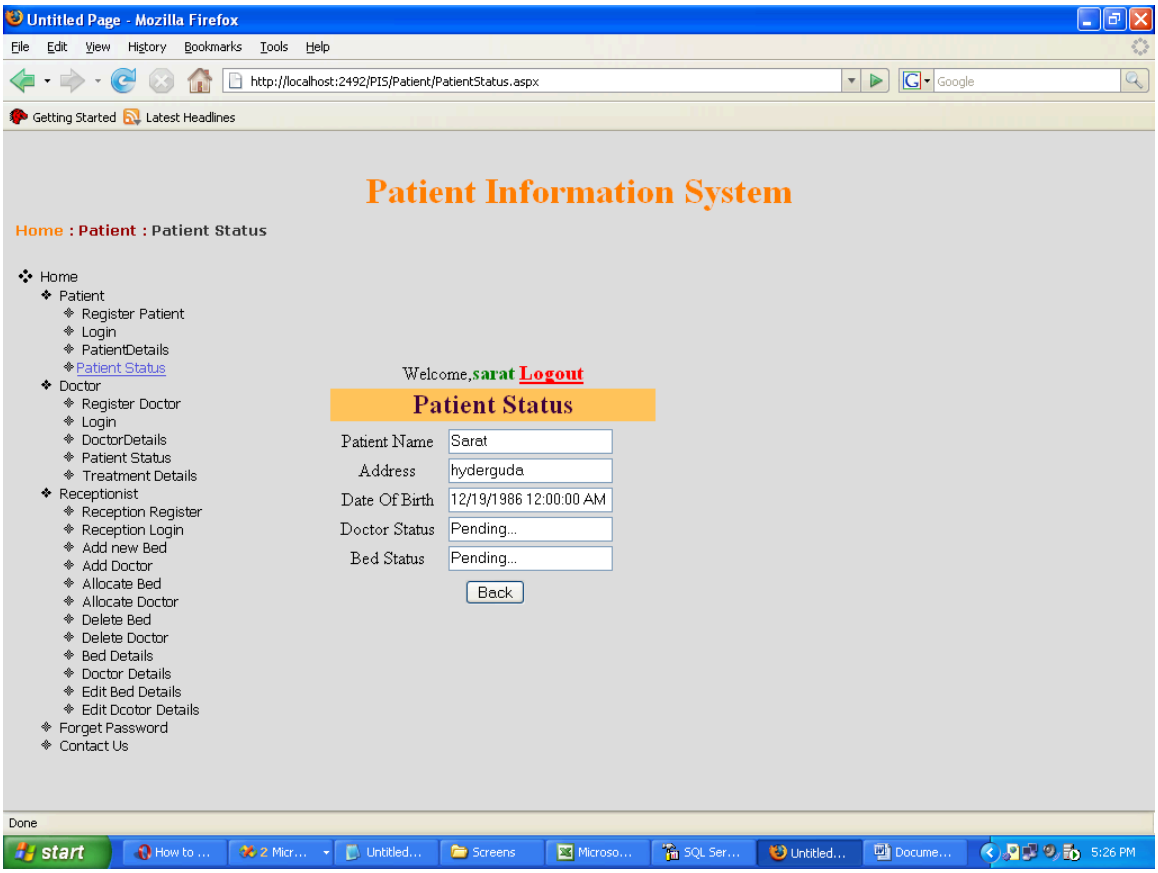
Patient Login:



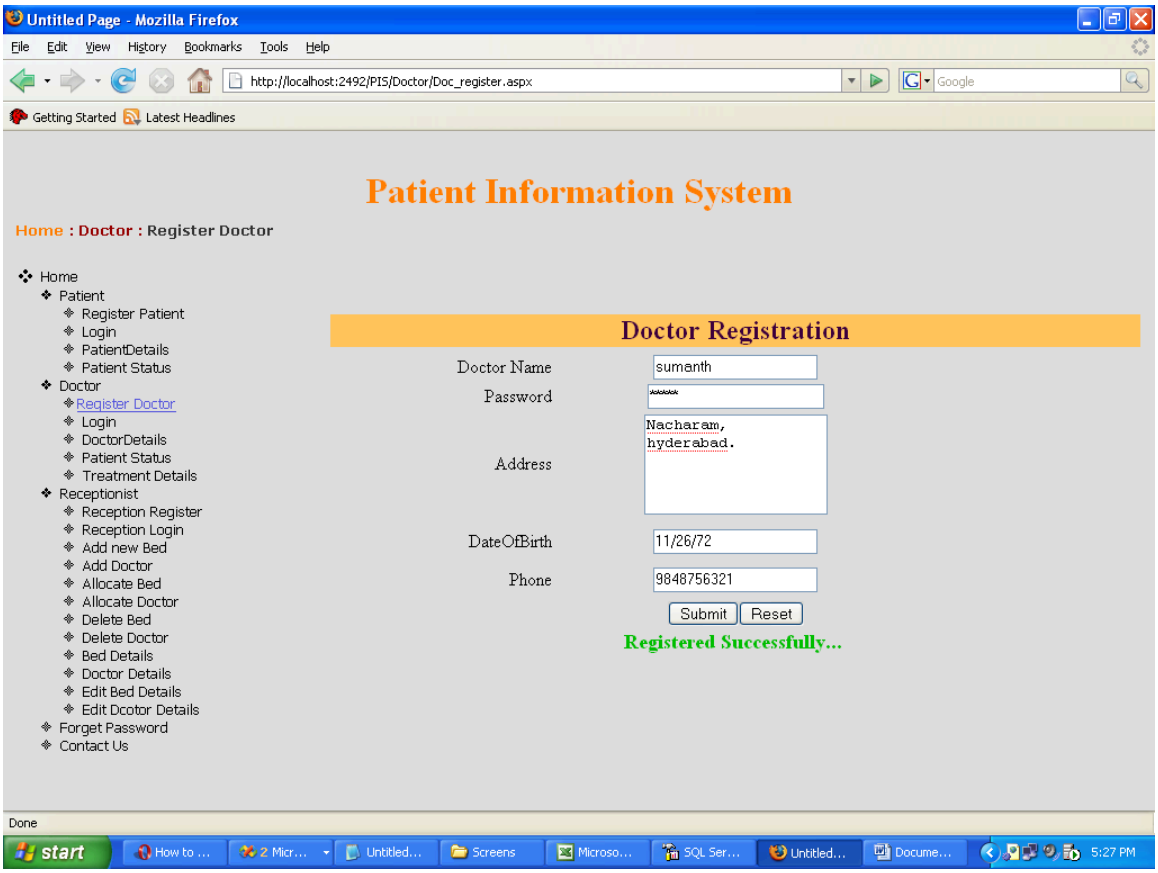
Patient Details:



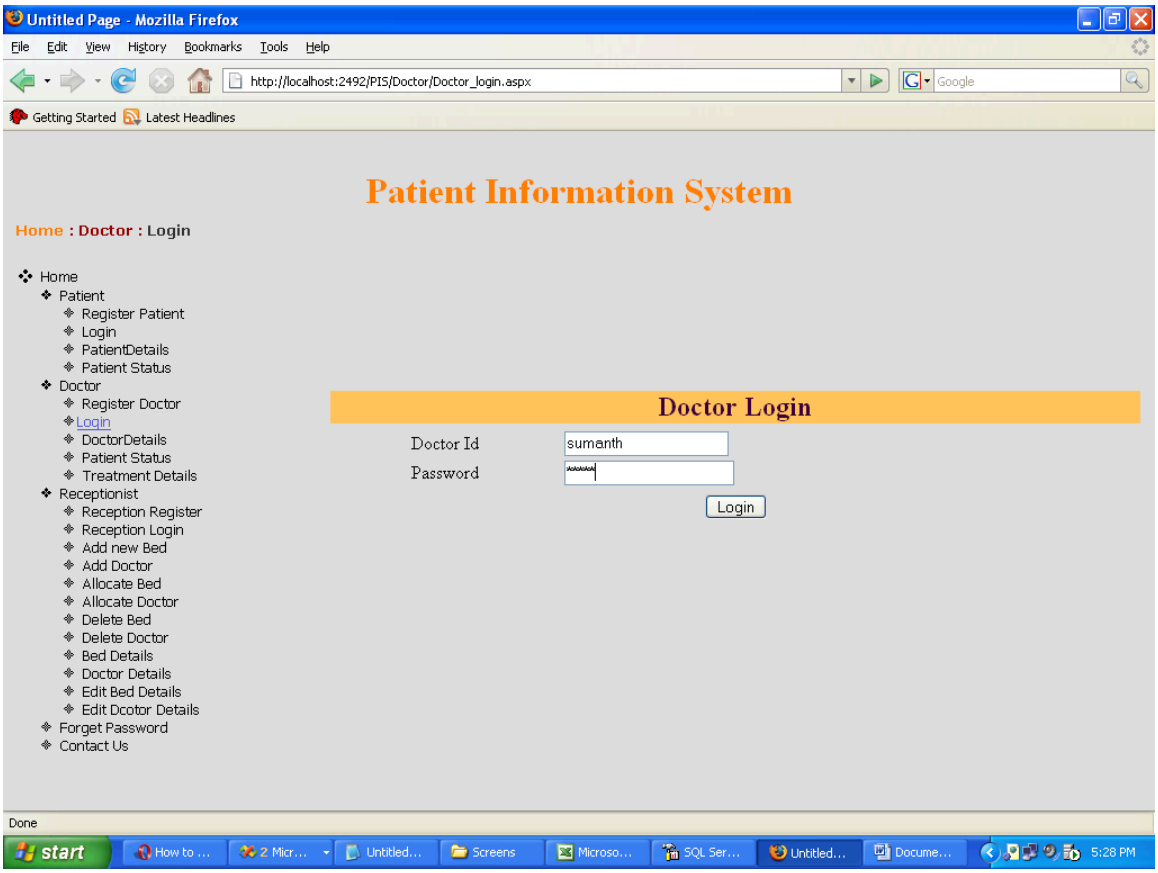
Patient Status:



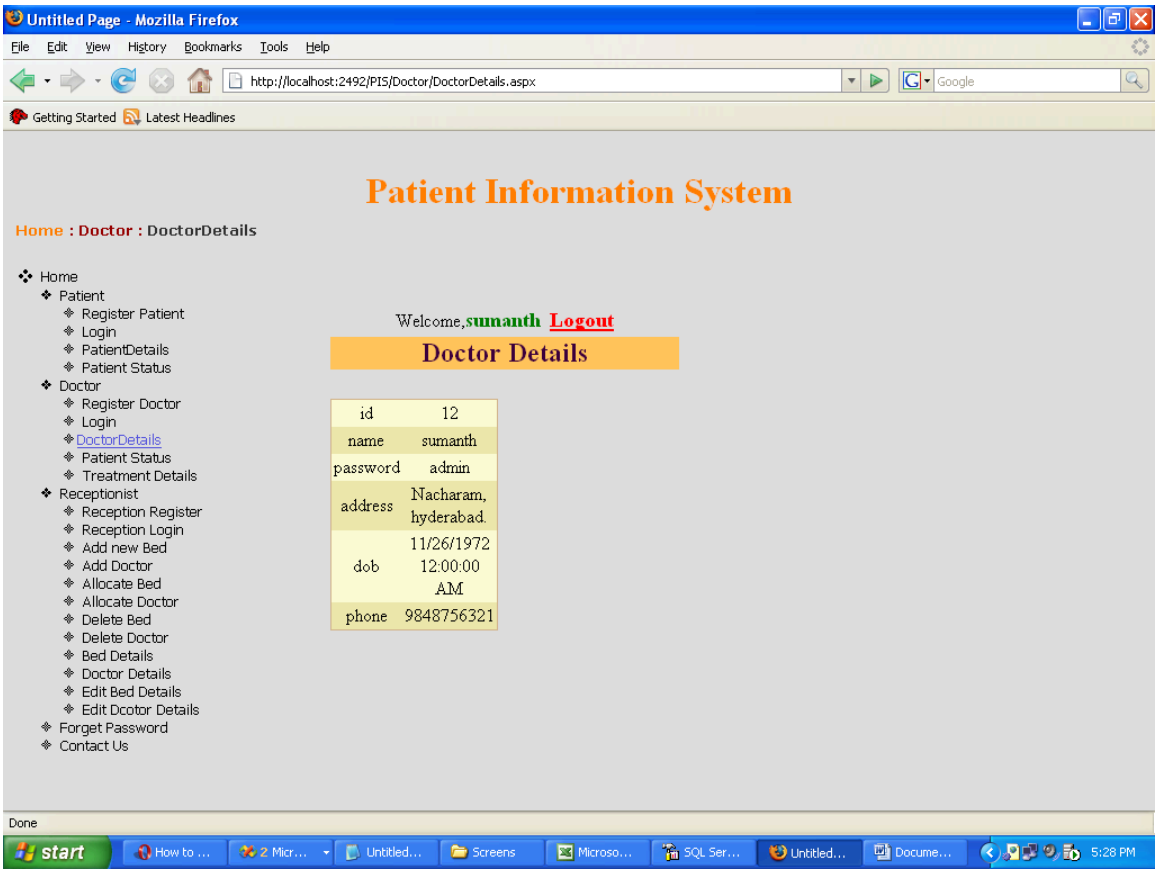
Doctor Registration:



Doctor Login:

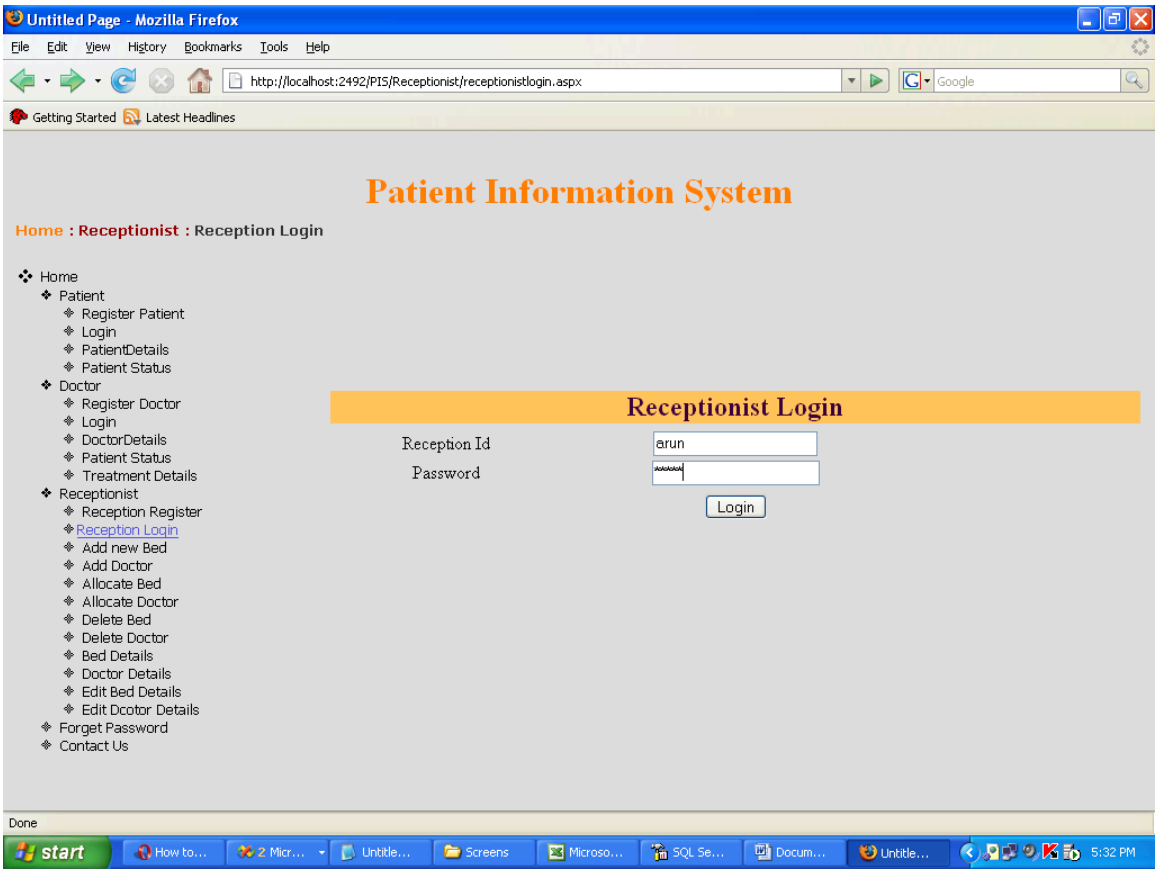


Doctor Details:

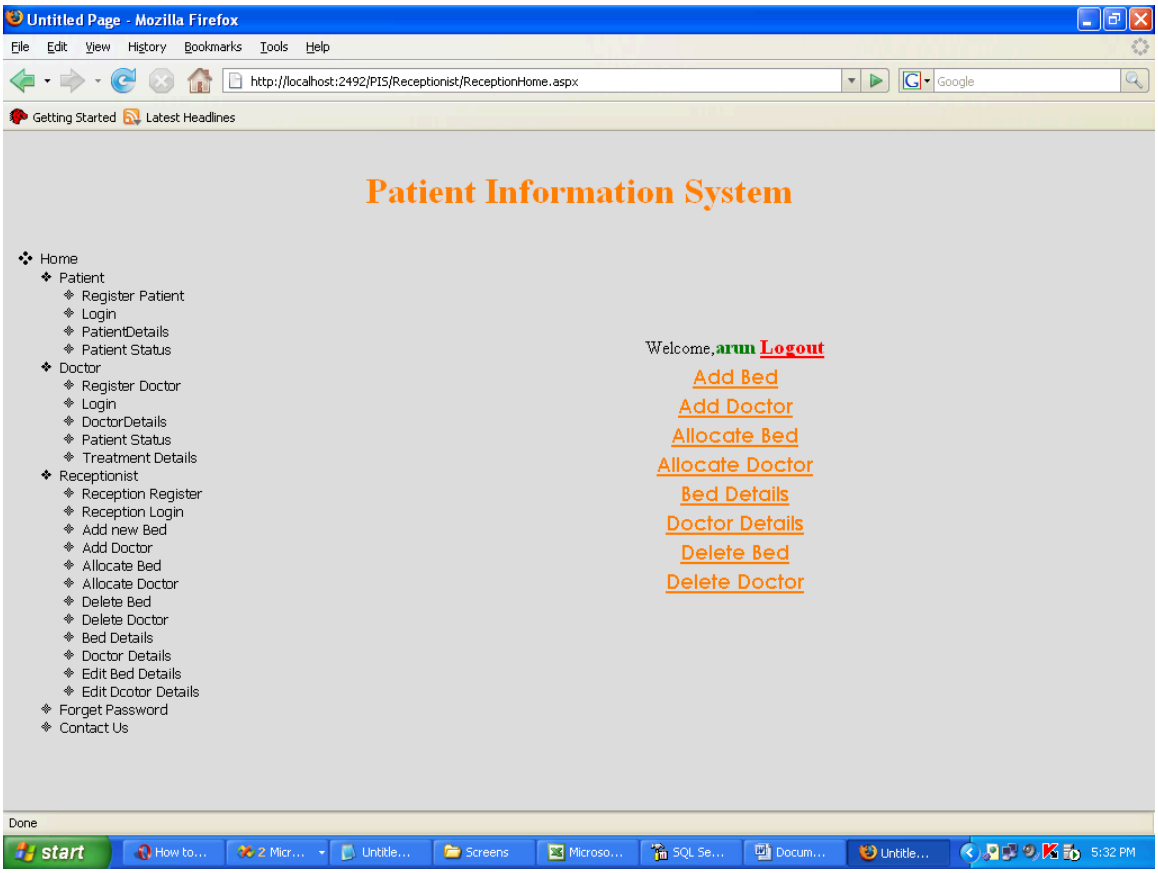


Reception Registration:

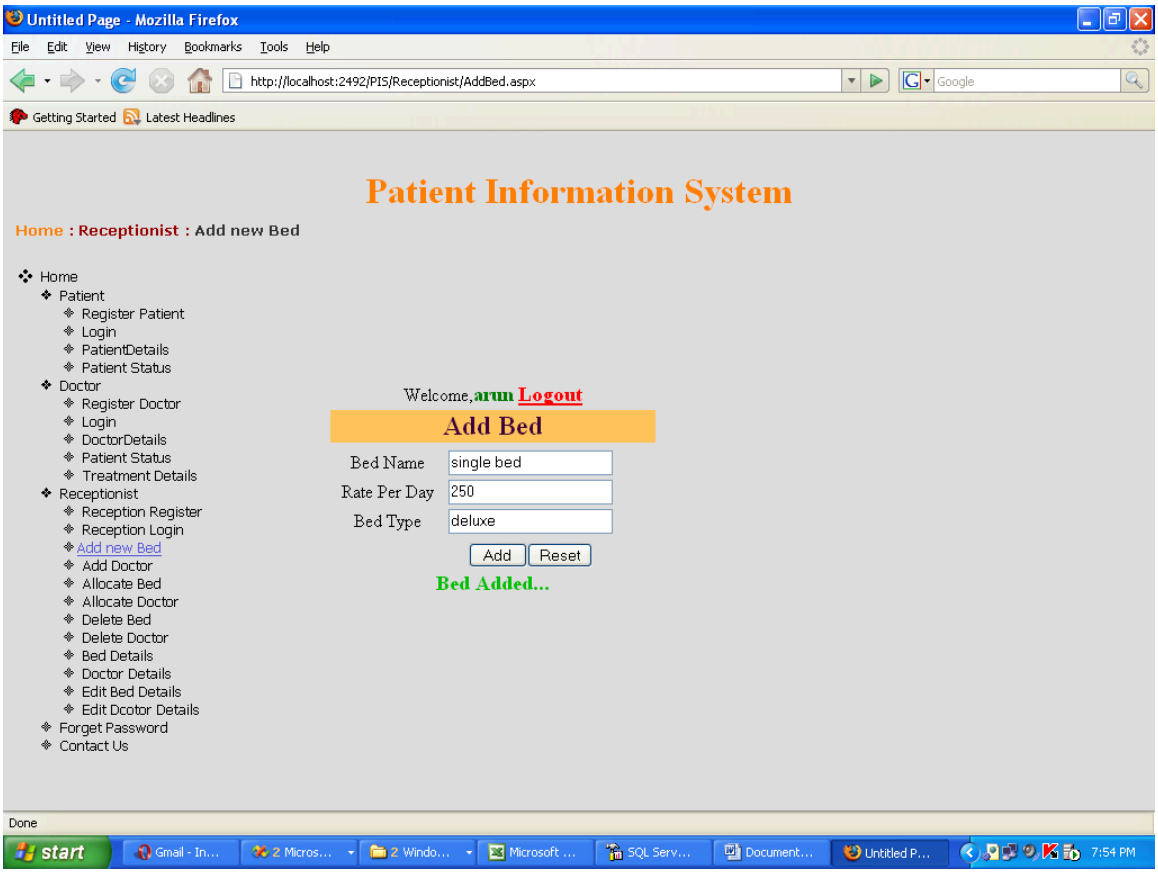
Reception Login:



Reception Home:



Add Bed: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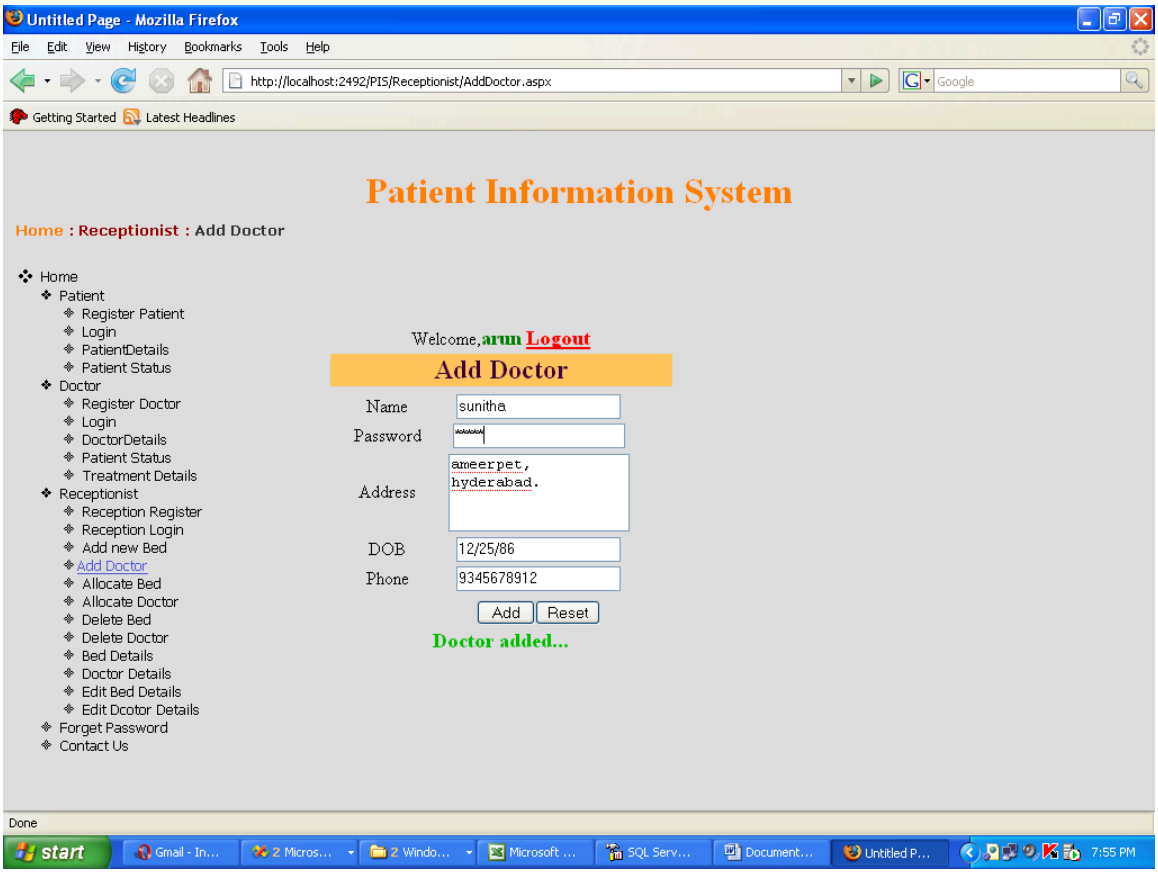
File Edit View History Bookmarks Tools Help
http://localhost:2492/PIS/Receptionist/AddBed.aspx
Getting Started Latest Headlines
Patient Information System
Home : Receptionist : Add new Bed
Home
Patient
Register Patient
Login
PatientDetails
Patient Status
Doctor
Register Doctor
Login
DoctorDetails
Patient Status
Treatment Details
Receptionist
Reception Register
Reception Login
Add new Bed
Add Doctor
Allocate Bed
Allocate Doctor
Delete Bed
Delete Doctor
Bed Details
Doctor Details
Edit Bed Details
Edit Dcotor Details
Forget Password
Contact Us
Welcome,arun Logout
Add Bed
Bed Name single bed
Rate Per Day 250
Bed Type deluxe
Add Reset
Bed Added...
Done
start
7:54 PM

Add Doctor: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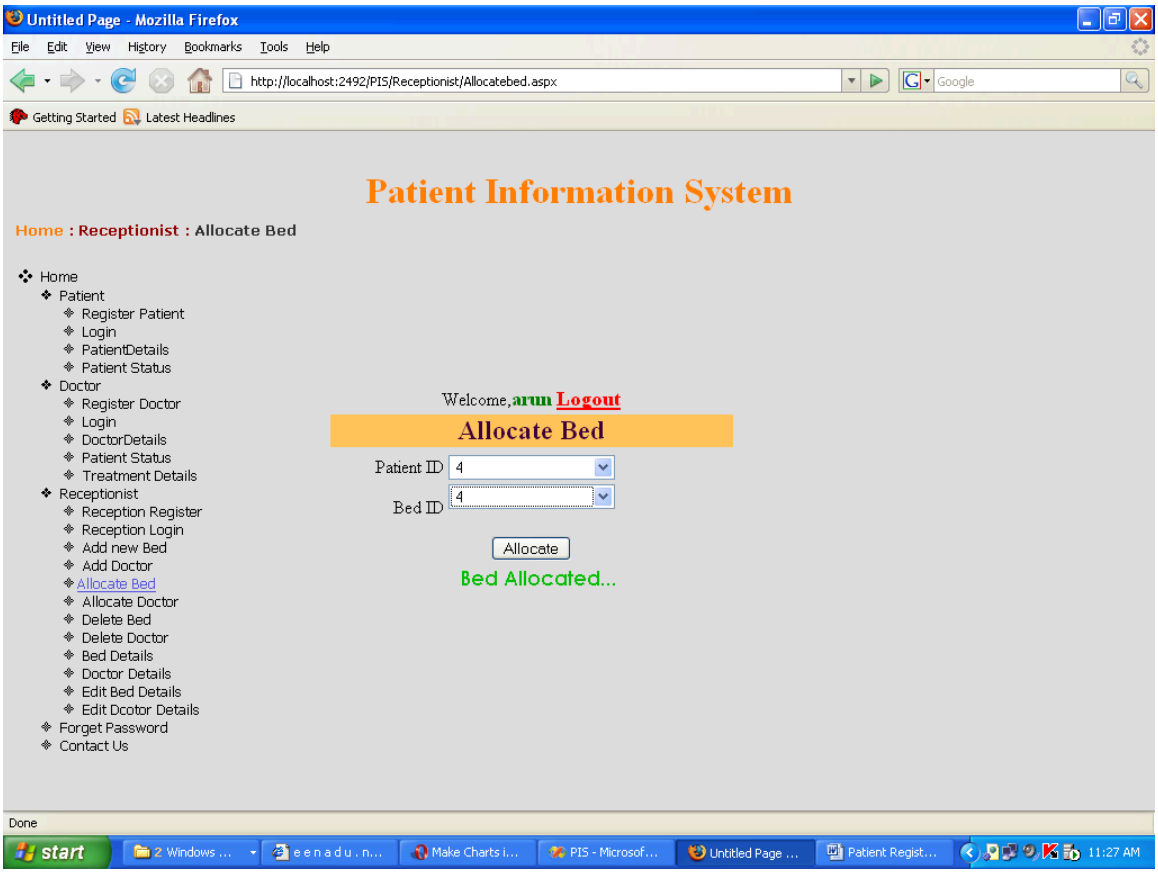
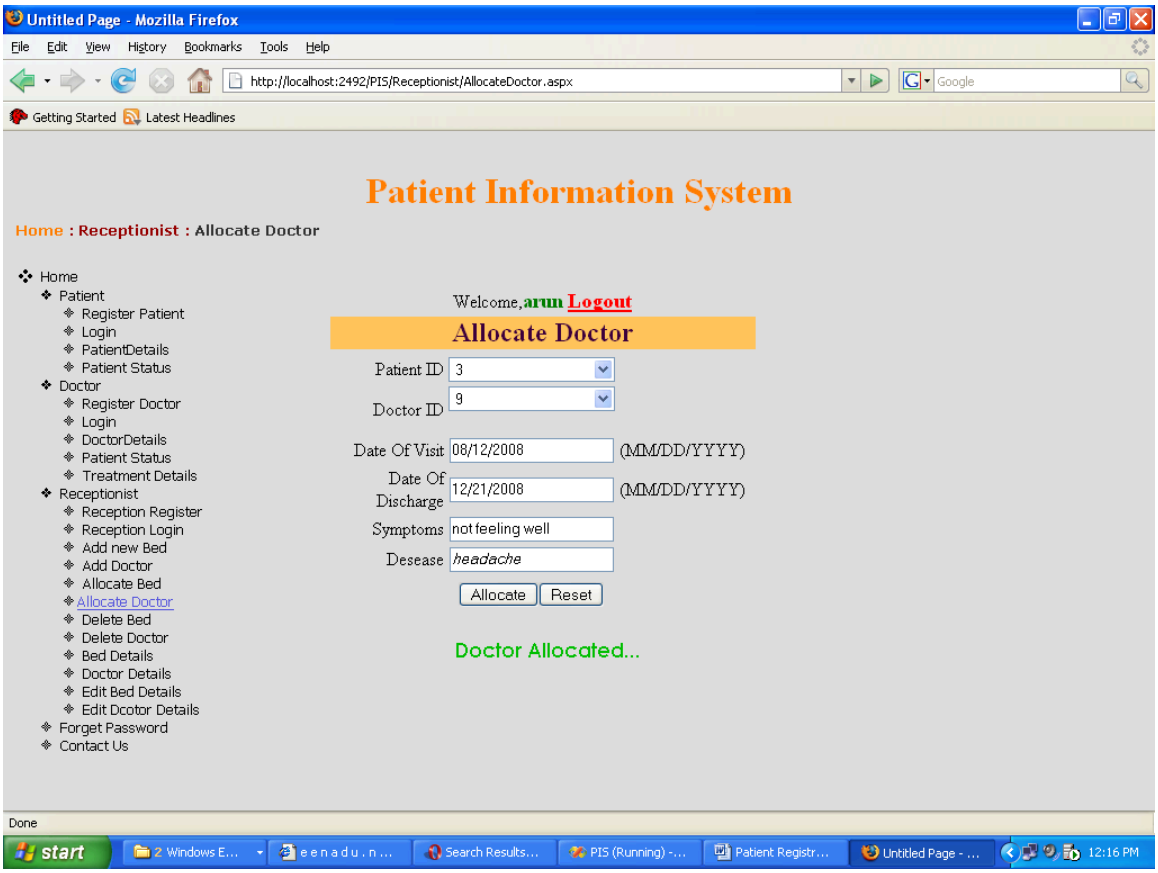
http://localhost:2492/PIS/Receptionist/AddDoctor.aspx
Getting Started Latest Headlines
Patient Information System
Home : Receptionist : Add Doctor
Home
Patient
Register Patient
Login
PatientDetails
Patient Status
Doctor
Register Doctor
Login
DoctorDetails
Patient Status
Treatment Details
Receptionist
Reception Register
Reception Login
Add new Bed
Add Doctor
Allocate Bed
Allocate Doctor
Delete Bed
Delete Doctor
Bed Details
Doctor Details
Edit Bed Details
Edit Dcotor Details
Forget Password
Contact Us
Welcome,arun Logout
Add Doctor
Name sunitha
Password
Address ameerpet, hyderabad.
DOB 12/25/86
Phone 9345678912
Add Reset
Doctor added...
Done
start
7:55 PM

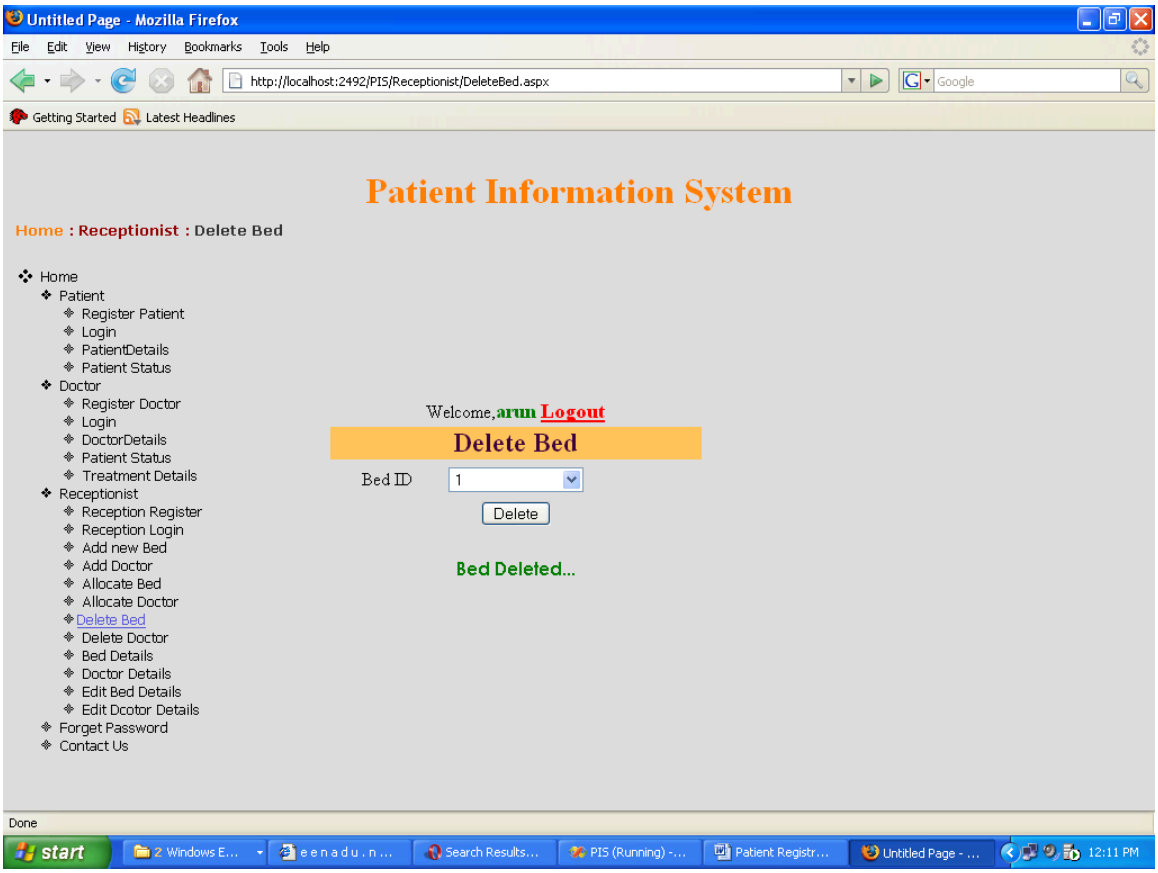
Allocate Bed:



Allocate Doctor:



Delete Bed: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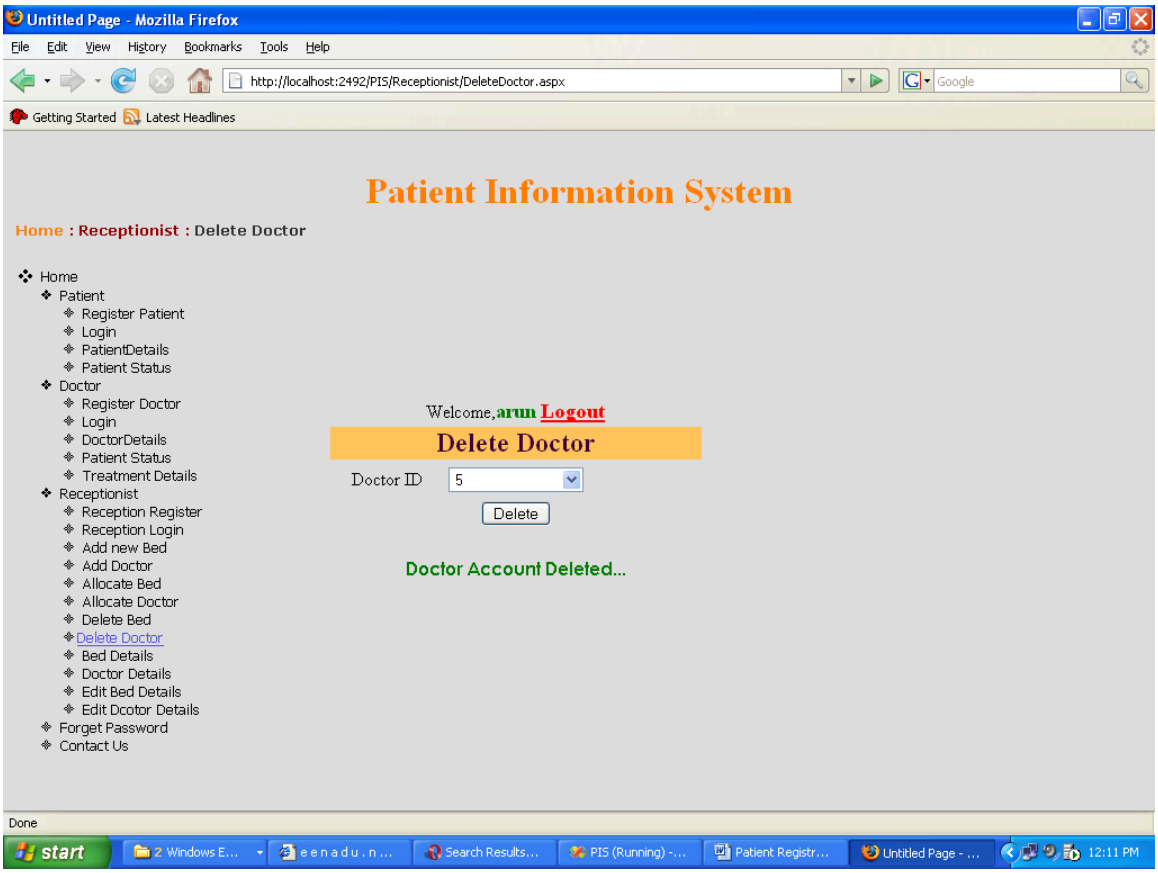
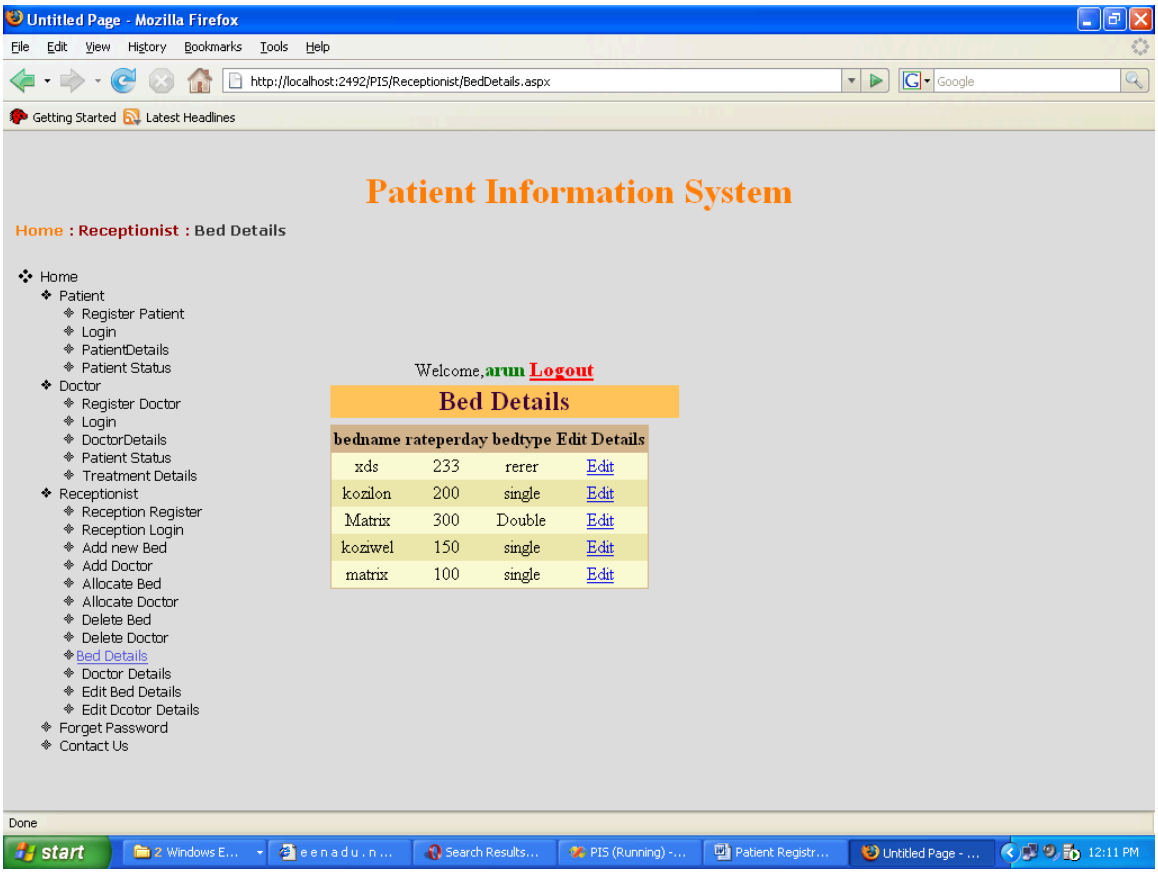
File Edit View History Bookmarks Tools Help
http://localhost:2492/PIS/Receptionist/DeleteBed.aspx
Getting Started Latest Headlines
Patient Information System
Home : Receptionist : Delete Bed
Home
Patient
Register Patient
Login
PatientDetails
Patient Status
Doctor
Register Doctor
Login
DoctorDetails
Patient Status
Treatment Details
Receptionist
Reception Register
Reception Login
Add new Bed
Add Doctor
Allocate Bed
Allocate Doctor
Delete Bed
Delete Doctor
Bed Details
Doctor Details
Edit Bed Details
Edit Dcotor Details
Forget Password
Contact Us
Welcome,arun Logout
Delete Bed
Bed ID
1
Delete
Bed Deleted...
Done
start
12:11 PM

Delete Doctor:



Bed Details: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http://localhost:2492/PIS/Receptionist/BedDetails.aspx
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Patient Information System
Home : Receptionist : Bed Details
Home
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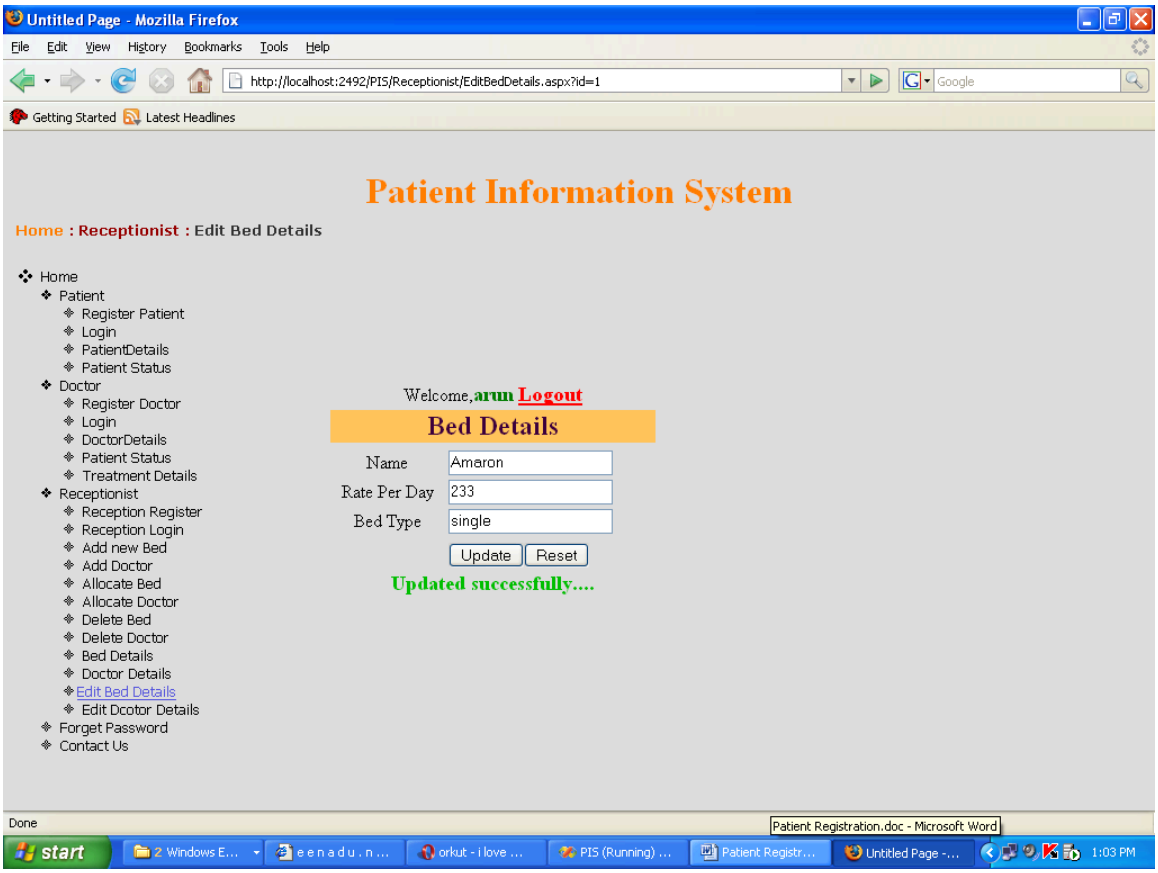
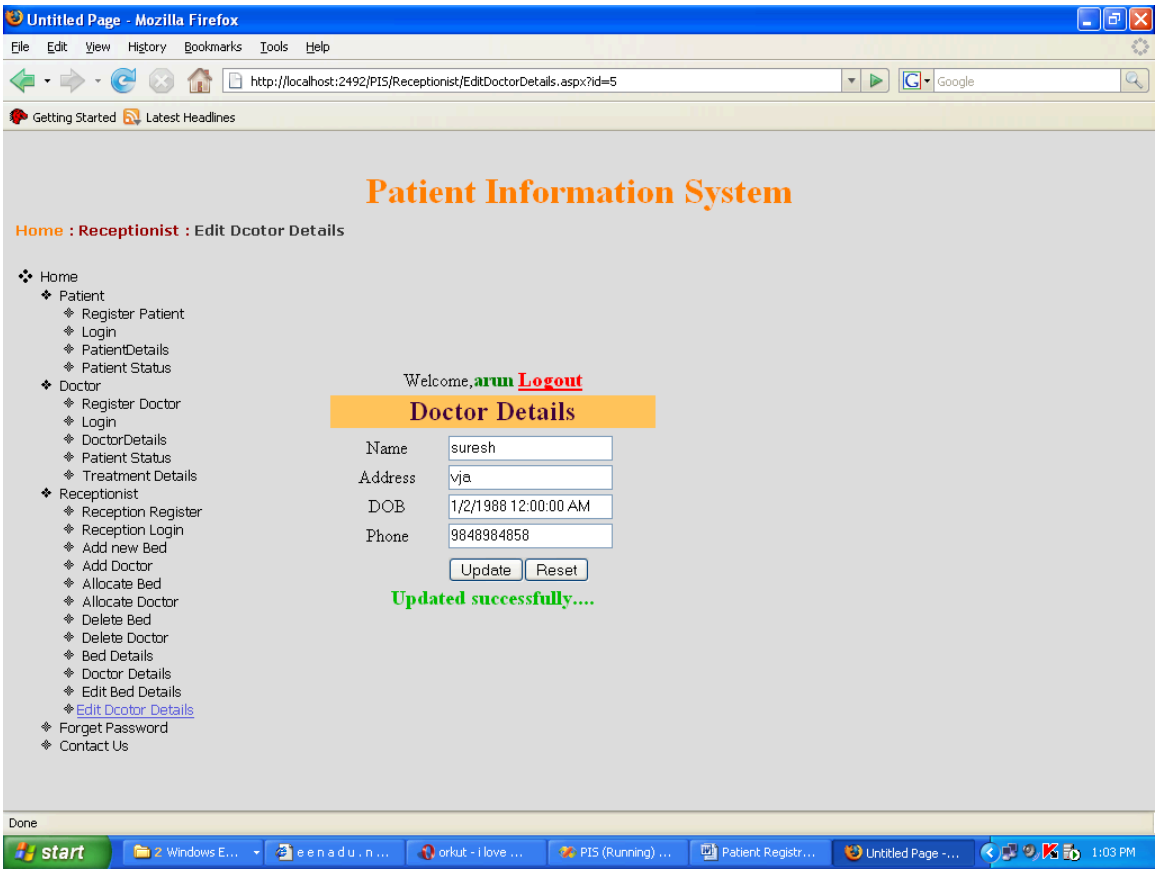
Register Patient
Login
PatientDetails
Patient Status
Doctor
Register Doctor
Login
DoctorDetails
Patient Status
Treatment Details
Receptionist
Reception Register
Reception Login
Add new Bed
Add Doctor
Allocate Bed
Allocate Doctor
Delete Bed
Delete Doctor
Bed Details
Doctor Details
Edit Bed Details
Edit Dcotor Details
Forget Password
Contact Us
Welcome,arun Logout
Bed Details
bedname rateperday bedtype Edit Details
xds 233 rerer Edit
kozilon 200 single Edit
Matrix 300 Double Edit
koziwel 150 single Edit
matrix 100 single Edit
Done
start
12:11 PM

Edit Bed Details:



Edit Doctor Details:



9. Testing

Testing is the process of detecting errors. Testing performs a very critical role for quality assurance and for ensuring the reliability of software. The results of testing are used later on during maintenance also

Psychology of Testing

The aim of testing is often to demonstrate that a program works by showing that it has no errors. The basic purpose of testing phase is to detect the errors that may be present in the program. Hence one should not start testing with the intent of showing that a program works, but the intent should be to show that a program doesn't work.

Testing is the process of executing a program with the intent of finding errors.

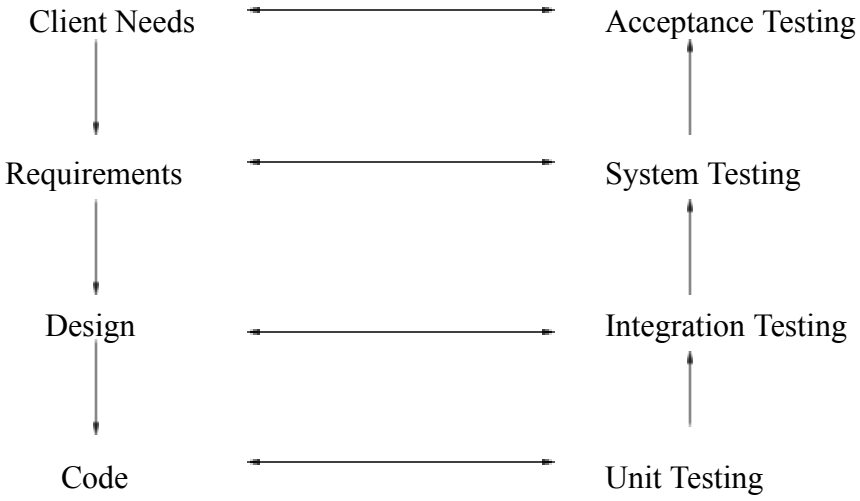
Testing Objectives:

The main objective of testing is to uncover a host of errors, systematically and with minimum effort and time. Stating formally, we can say,

- Testing is a process of executing a program with the intent of finding an error.
- A successful test is one that uncovers an as yet undiscovered error.
- A good test case is one that has a high probability of finding error, if it exists.
- The tests are inadequate to detect possibly present errors.
- The software more or less confirms to the quality and reliable standards.

LEVELS OF TESTING

In order to uncover the errors present in different phases we have the concept of levels of testing. The basic levels of testing are



A series of testing is done for the proposed system before the system is ready for the user acceptance testing.

The steps involved in Testing are:

9.1 Unit Testing:

Unit testing focuses verification efforts on the smallest unit of the software design**,** the module**.** This is also known as "Module Testing"**.** The modules are tested separately**.** This testing carried out during programming stage itself**.** In this testing each

module is found to be working satisfactorily as regards to the expected output from the module**.**

9.2 Integration Testing:

Data can be grossed across an interface**;** one module can have adverse efforts on another**.** Integration testing is systematic testing for construction the program structure while at the same time conducting tests to uncover errors associated with in the interface. The objective is to take unit tested modules and build a program structure**.** All the modules are combined and tested as a whole**.** Here correction is difficult because the isolation of cause is complicate by the vast expense of the entire program. Thus in the integration testing stop**,** all the errors uncovered are corrected for the text testing steps**.**

9.3 System testing:

System testing is the stage of implementation that is aimed at ensuring that the system works accurately and efficiently for live operation commences. Testing is vital to the success of the system. System testing makes a logical assumption that if all the parts of the system are correct, then goal will be successfully achieved.

The four major system testing are

i. Recovery Testing

ii. Security Testing

iii. Stress Testing

iv. Performance Testing

RECOVERY TESTING

Recovery testing is a system test that forces the software to fail in a variety of ways and verifies that recovery is properly performed. If recovery is automatic, re-initialization, checkpoint mechanisms, data recovery, and restart are each evaluated for correctness. If recovery requires human intervention, the mean time to repair is evaluated to determine whether it is within acceptable limits**.**

SECURITY TESTING

Security testing attempts to verify that protection mechanisms built into a system will, in fact, protect it from improper penetration. During security testing, the tester plays the role of the individual who desire to penetrate the system. Given enough time and resources, good security testing will ultimately penetrate a system. The role of the system designer is to make penetration cost more than the value of the information that will be obtained.

STRESS TESTING

During earlier software testing steps, white box and black box techniques resulted in a thorough evaluation of normal program functions and performance. Stress tests are designed to confront programs with abnormal situations**.**

PERFORMANCE TESTING

For real-time and embedded systems, software that provides required function but does not confirm to performance requirements is unacceptable. Performance testing is designed to test the run-time performance of software within the context of an integrated system. Performance testing occurs throughout all steps in the testing process.

Performance tests are sometimes coupled with stress testing and often require both hardware and software instrumentation. That is, it is often necessary to measure resource utilization. By instrumenting a system, the tester can uncover situations that lead to degradation and possible system failure.

9.4 Validation Testing:

At the conclusion of integration testing software is completely assembled as a package, interfacing errors have been uncovered and corrected and a final series of software tests begins**,** validation test begins**.** Validation test can be defined in many ways**.** But the simple definition is that validation succeeds when the software function in a manner that can reasonably expected by the customer. After validation test has been conducted one of two possible conditions exists.

One is the function or performance characteristics confirm to specifications and are accepted and the other is deviation from specification is uncovered and a

deficiency list is created. Proposed system under consideration has been tested by using validation testing and found to be working satisfactorily.

9.5 Output Testing:

After performing validation testing, the next step is output testing of the proposed system since no system could be useful if it does not produce the required output in the

specified format. Asking the users about the format required by them tests the outputs generated by the system under consideration. Here the output format is considered in two ways, one is on the screen and other is the printed format. The output format on the screen is found to be correct as the format was designed in the system designed phase according to the user needs. For the hard copy also the output comes as the specified requirements by the users. Hence output testing does not result any corrections in the system.

9.6 User Acceptance Testing:

User acceptance of a system is the key factor of the success of any system. The system under study is tested for the user acceptance by constantly keeping in touch with the prospective system users at the time of developing and making changes wherever required.

Test Data:

Taking various kinds of test data does the above testing. Preparation of test data plays a vital role in the system testing after preparing the test data the system under study is tested using the test data. While testing the system by using the test data errors are again uncovered and corrected by using above testing steps and corrections are also noted from the future use.

Testing:

The testing done here was System Testing–checking whether the user requirements were satisfied. The code for the new system has been written completely using JSP as the coding language, HTML as the interface for front-end designing and Java Script for validating the client-side applications. The new system has been tested well with the help of the users and all the applications have been verified from every nook and corner of the user.

Although some applications were found to be erroneous these applications have been corrected before being implemented. The flow of the forms has been found to be very much in accordance with the actual flow of data.

10. Conclusion:

It can be seen that deploying IT can help the medical profession in improving its quality of service and thus automatically increasing the preparedness and defensiveness. It is of vital importance that the software must have the right type of modularity and openness so that it is manageable, maintainable and upgradeable. The hardware should be reliable, available and have the necessary performance capacity.

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C#.NET Black Book

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MSDN 2005

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