Hospital Management

Team Members -

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Introduction

The mini-world for this project is a Hospital, which has the patients, the doctors, the nurses and other hospital staff, and provides treatments, services to the patients according to the concerned issue involved. This allows the hospital to have control over managing the hospital inventory [stock of medicines and associated essential items] and staff according to the need, managing its finances , availability of beds and thus a better utilisation of resources, allowing a systematic approach for running the hospital.

Purpose

The purpose of the hospital management system database Design is to provide a secure and easy way of storing information of the patient, doctors, nurses, other hospital staff, inpatients, outpatients, Rooms, Bills etc.

Users

Users of this database will be:

1. Hospital Administrators
2. Doctors
3. Lab technicians
4. General Users - patients for checking appointments

Applications

The database system facilitates:

1. Administrators to add / update details of a patient, schedule appointments, etc.

2. Doctors to access the details of the patient that may include the patient's previous treatment record, lab reports etc.

3. Lab Technicians to upload the test reports of the patients for the tests, and submit the lab report.

4. Accounting Department to bill a patient, depending on treatment cost, Lab Tests and other factors involved.

5. Hospital Administration to manage its resource supplies such as medicines, medical equipment, ambulance services etc.

6. Hospital Administration to add/update the details of hospital staff such as salaries, working shifts etc.

7. Patients to manage/schedule appointments, track undergoing/past treatment, etc.

Database Requirements

Entities

1. Doctor
    a. Phone
    b. Name
    c. Qualification
    d. Experience
    e. Gender
    f. Dob
    g. Blood Group
    h. Address
    i. Visiting hours
    j. Salary
    k. Email

IS A (subclass)

1. Permanent
    1. Qualification
    2. Position
    3. Doc id
    4. Number of patients attended (derived)
2. Trainee
    1. Doc ID (under whose supervision)
    2. Temporary ID
    3. Education : (complex attribute)

BONUS
Alternate Key - email
Candidate Key - phone number
Super Key set of {name, phone number, email}

2. Medical Department

    a. Number of doctors
    b. Name
    c. Location (building and floor)

3. Nurses

    a. Nurse id
    b. Phone
    c. Name
    d. Gender
    e. Dob
    f. Blood Group
    g. Address
    h. Shift
    i. Qualification
    j. Experience
    k. Salary

4. Lab Technician

    a. Name
    b. Employee Id
    c. Gender
    d. Phone Number
    e. Dob
    f. Blood group
    g. Qualification
    h. Experience
    i. Salary

5. Lab Department

    a. Name
    b. Location
    c. No. of staff

6. Driver

    a. Employee id
    b. Phone
    c. Name
    d. Gender
    e. Dob
    f. Blood Group
    g. Address
    h. Driving License No:
    i. Driver Insurance Id
    j. Salary

7. Ambulance

    a. Vehicle Registration Number
    b. Vehicle Model
    c. Insurance ID

    Vehicle Registration Number and Insurance ID both can act as primary keys. So one would be a primary key and the other would-be candidate key.

8. Bills

    a. Amount (derived)
    b. Transaction ID

c. Payment Details (Date-Time, Mode of Payment)

9. ROOM

a. Room No:
b. Room-Type:
c. Cost (per day)

10. Patient

a. Name
b. DOB
c. Patient Id
d. Mobile Number
e. Blood Group

IS A

1. In-Patient
    a. Room Number
    b. Bed Number
    c. Operation
    d. Date of Arrival
    e. Date of Discharge

2. Out-Patient

11. Test

a. Test ID
b. Test Description
c. Cost

12. Lab Report // contains test results //

a. Report ID
b. Result Description

13. Appointment

    a. Appointment ID
    b. Date of appointment
    c. Time of appointment
    d. cost

14. Medicine

    a. Medicine ID
    b. Cost
    c. stock

15. Other Staff

    a. Name
    b. Employee Id
    c. Gender
    d. Phone Number
    e. Dob
    f. Blood group
    g. Work
    h. Salary

16. Disease

    a. Disease Id
    b. Disease Name

Weak Entity:

1. Visitor of patient
    a. Name
    b. Relation with patient
2. Emergency contact of the patient
    a. Name
    b. Phone Number
    c. Relation with patient

Relationships

1. N=2 Relationship
    a. Driver **Drives** Ambulance
        i. 1:1
        ii. full participation by the driver
    b. A doctor **works in** the medical department
        i. 1:1
        ii. full participation by the doctor
    c. Lab technician **work in** the lab department
        i. 1:1
        ii. full participation by the technician
    d. Visitor **related to** patient
        i. (0,n):(1,1)
        ii. A patient may have 0 or many visitors

e. Emergency contact **of** patient
    i. 1:1
    ii. Each patient will have an emergency contact

f. Patient **is diagnosed with** disease
    i. 1:n

2. N = 3 Relationship

a. **Stay** Nurses Room IN-Patient

    i. Nurses are assigned to a room and In-Patient stays at a room
    ii. 1:n:1

b. **Prescribe** Doctor, Medicine and Patient

    i. 1:n:1
    ii. A doctor can prescribe multiple medicines to a patient

c. **Scheduled** Appointment between Doctor and Out-patient

    i. 1:1:1
    ii. An appointment will be unique for a patient and doctor combination.

d. **Pays** Out-Patient, Appointment and Bills

    i. 1:m:1

3. N=5 Relationship

a. **Advice** Doctor, Patient, Test, Lab Technician, Lab report

   i. The doctor advises a patient to take a test which is taken by a lab technician and a lab report is generated.
   ii. 1:1:n:m:1

b. **Pays** InPatient, Medicine, Room, Lab Report and Bills

   i. 1:n:m:t:1
   ii. A patient can have multiple medicines, stayed in multiple rooms and have multiple tests but 1 final bill.

Functional Requirements

Modifications

1. Entities on which we can perform add, update and delete operations on patients, doctors, nurses, drivers and other staff.

2. Updation of doctor salary

3. Addition of new patient

4. Vacating patient from a room after he has been discharged

Retrievals

1. Selection:

   - Name of doctors working
   - Name of departments
   - Name of lab-test

2. Projection:

    - Users can get the name of the doctor at a particular position in a specific department.
    - Cost of a particular test
    - Number of beds available in a room
    - Number of a particular medicine available

3. Aggregate:

    - The average salary of doctors working.

4. Search:

    - Details of patients that have a particular name.
    - Details of patients that have bought a particular medicine.

5. Analysis:

    - Details of patients that have stayed for more than the average time of stay by patients.
    - Number of active patients that are diagnosed with a particular disease

Key:

RED - Represent Subclass
Blue - Composite Attribute
Pink - Multi-valued
Green - Derived Attribute
Mustard -Database Requirement “At least one entity with two primary key attributes”