M.E.D.U.S.A.

(Medical Data Utilized for Systemic Archives)

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This database management system organizes the records of a hospital. The hospital uses this system in order to keep its data organized.

Entity Sets:

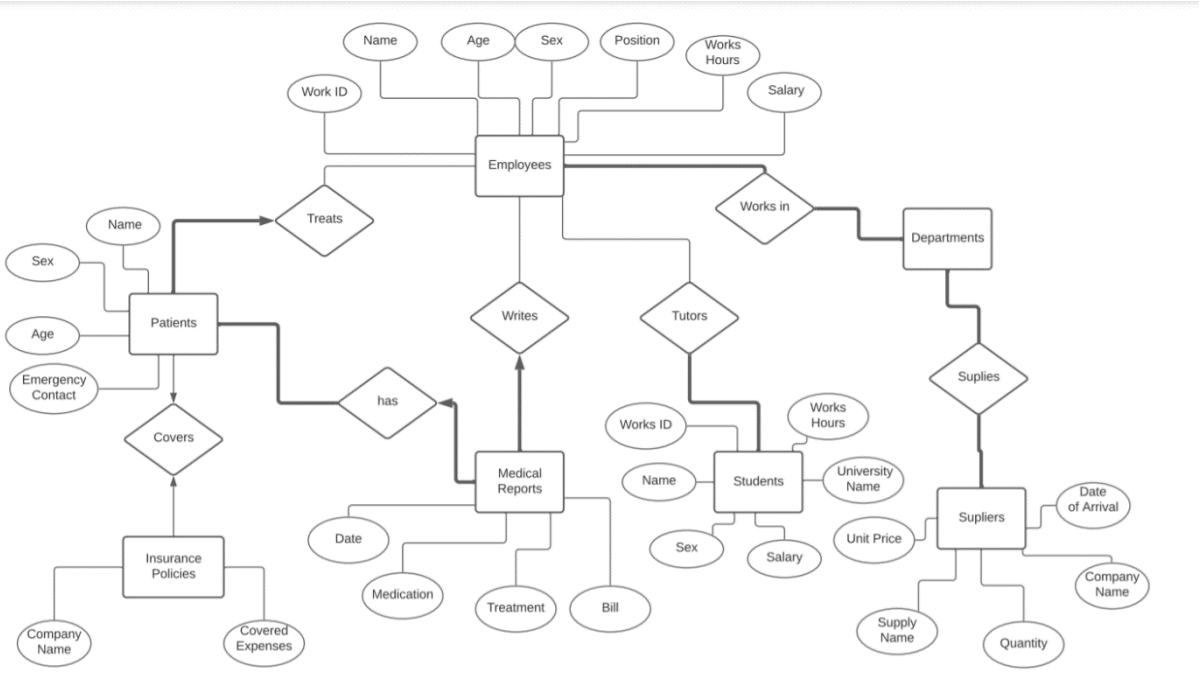
1. The hospital consists of multiple departments. Each department has a name, several employees, and a manager that oversees the department.
2. Each employee in the hospital has detailed information about them in the system. They are given a work id which helps to keep the data organized. Alongside the id, the name, age, sex, position, and salary of each employee is kept in the database management system.
3. Patients have their id, name, sex, age, and their guardian's or emergency contact's phone number stored within the system. In addition to this information, a medical report about each visit is stored as a separate entity set.
4. Information in the medical record includes employees who treat the patients, the types of treatments they used, the date of the visit, and the prescribed medication.
5. Patients may have insurance policies that help them cover the expenses of the medical procedures. If the patient has an insurance policy, the name of the insurance company and the benefits they provide to the patient are stored. In the case of a patient having no current insurance policy, all the previously mentioned data points are left empty.

6. Students from various universities are working as interns in order to gain work experience in the hospital. The interns are assigned a temporary work id. Along with their work id, their name, sex, salary, and the university they came from is included in their record in the database management system.
7. Hospitals have many necessities that keep the health service uninterrupted. The suppliers and the details of the supplies they provide to the hospital are kept in the database management system. The unit price, quantity, type of the supplies, and the date of the supplies arrived at the hospital are all included.

Relationship Sets:

1. The relationship between departments and employees: Each department should have at least one employee, and an employee can work in multiple departments. Employees need to be in at least one department. The department head is considered an employee, and their information is kept in the system much like anyone else.
2. The relationship between patients and employees: The employees treat patients, and they can treat more than one patient, but the patient cannot visit multiple doctors in one visit. Each employee does not need to treat a patient as they might be non-medical staff; however, a patient must be treated by an employee.
3. The relationship between patients, employees, and medical reports: Each doctor visit is kept as a separate entity named medical reports.
4. The relationship between patients and insurance companies: Insurance companies cover the expenses of patients. Patients can use one or no insurance policy per visit. The same company can provide benefits to many patients.
5. The relationship between interns and employees: All interns must have one mentor. Employees do not have any restrictions on how many interns they can have under their tutelage.
6. The relationship between departments and suppliers: Each department can have more than one supplier, and each supplier can provide to more than one department. Each department has to have at least one supplier.

ER Model:



Relational Model:

Entities:

CREATE TABLE Employees

(work_id INTEGER,

emp_name CHAR(30),

emp_age INTEGER,

emp_sex CHAR(1),

position CHAR(30),

emp_salary REAL,

PRIMARY KEY (work_id)

)

```
CREATE TABLE Patients
(patient_id INTEGER,
patient_name CHAR(30),
patient_age INTEGER,
patient_sex CHAR(1),
emergency_contact CHAR(10),
PRIMARY KEY (paitent_id)
)

CREATE TABLE Medical_Reports
(report_no INTEGER,
 date DATE,
 medication CHAR(20),
 treatment CHAR(50),
 bill REAL,
 PRIMARY KEY (report_no)
)

CREATE TABLE Students
(student_id INTEGER,
student_name CHAR(30),
student_sex CHAR(1),
student_salary REAL,
uni_name CHAR(30),
PRIMARY KEY (student_id)
)

CRETAE TABLE Departments
(dep_id INTEGER,
dep_name CHAR(30),
manager INTEGER,
PRIMARY KEY (dep_id))
```

```
CREATE TABLE Suppliers
(supplier_name CHAR(30),
supply_name CHAR(30),
supply_date DATE,
quantity REAL,
unit_price REAL,
PRIMARY KEY (supplier_name)
)

CREATE TABLE Insurance
(company_name CHAR(30),
PRIMARY KEY (company_name)
)
```

Relationships:

```
CREATE TABLE Treats(
patient_id INTEGER,
work_id INTEGER NOT NULL,
PRIMARY KEY (patient_id),
FOREIGN KEY (patient_id) REFERENCES Patients,
FOREIGN KEY (work_id) REFERENCES Employees
)

CREATE TABLE Covers
(patient_id INTEGER,
covered_expenses REAL,
company_name CHAR(30),
PRIMARY KEY (patient_id),
FOREIGN KEY (patient_id) REFERENCES Patients,
FOREIGN KEY (company_name) REFERENCES Insurance
)
```

```
CREATE TABLE Has
(patient_id INTEGER NOT NULL,
report_no INTEGER NOT NULL,
PRIMARY KEY (report_no),
FOREIGN KEY (patient_id) REFERENCES Patients,
FOREIGN KEY (report_no) REFERENCES Medical_Reports
)

CREATE TABLE Writes
(work_id INTEGER NOT NULL,
report_no INTEGER,
PRIMARY KEY (report_no),
FOREIGN KEY (work_id) REFERENCES Employees,
FOREIGN KEY (report_no) REFERENCES Medical_Reports
)
CREATE TABLE Tutors
(work_id INTEGER NOT NULL,
student_id INTEGER,
PRIMARY KEY (student_id),
FOREIGN KEY (work_id) REFERENCES Employees,
FOREIGN KEY (student_id) REFERENCES Students
)

CREATE TABLE Works_in
(work_id INTEGER NOT NULL,
dep_id INTEGER NOT NULL,
PRIMARY KEY (work_id, dep_id),
FOREIGN KEY (work_id) REFERENCES Employees,
FOREIGN KEY (dep_id) REFERENCES Departments
)
```

```
CREATE TABLE Supplies
(supplier_name CHAR(30) NOT NULL,
dep_id INTEGER NOT NULL,
PRIMARY KEY (supplier_name, dep_id),
FOREIGN KEY (supplier_name) REFERENCES Suppliers,
FOREIGN KEY (dep_id) REFERENCES Departments
)
```