Entities

Employee: “Strong entity contains 9 attributes”

- **FName** “Single/Simple”
- **Lname** “Single/Simple”
- **username** “Derived - unique”
- **Role** “Single/Simple”
- **Phone** “Multivalued - unique”
- **id** “Key - unique”
- **Email** “Single/Simple - unique”
- **Password** “Single/Simple”
- **NationalID** “Key - unique”

Patients: “Strong entity contains 9 attributes”

- **FName** “Single/Simple”
- **Lname** “Single/Simple”
- **History** “Single/Simple”
- **Age** “Single/Simple”
- **Phone** “Multivalued - unique”
- **id** “Key - unique”
- **Email** “Single/Simple - unique”
- **Admission Date** “Single/Simple”
- **NationalID** “Key - unique”

Diagnosing: “Strong entity contains 3 attributes”

- **id** “Single/Simple”
- **Date** “Single/Simple - unique”
- **Type** “Single/Simple”

Departments: “Strong entity contains 3 attributes”

- **id** “Key - unique”
- **Name** “Single/Simple”
- **Description** “Single/Simple”

Relations

Work:

- **Description:**

  Does **Employee** work in **Department**?
- **Degree:**

  Binary relation.
- **Ratio:**

  Many employees can work in **One** department.
- **Participation:**

  Employee **Must** be in a department.

  Department **May** be empty.

Manage:

- **Description:**

  Does **Employee** manage the **Department**?
- **Degree:**

  Binary relation.
- **Ratio:**

  One employees can work in **One** department.
- **Participation:**

  Employee **May** be in a department.

  Department **Must** be managed.

Make:

- **Description:**

  Does **Employee** make a **Diagnosis**?
- **Degree:**

  Binary relation.
- **Ratio:**

  Many employees can make **Mane** diagnosis.
- **Participation:**

  Employee **May** make a diagnosis.

  Diagnosis **Must** be done by an employee.

Supervise:

- **Description:**

  Does **Employee** Supervise any **Employees**?
- **Degree:**

  Unary relation.
- **Ratio:**

  One employee can Supervise **Many** employees.
- **Participation:**

  Employee **May** Supervise.

  Employee **May** Be Supervised.

Treat:

- **Description:**

  Does **Employee** treat **Patient**?
- **Degree:**

  Binary relation.
- **Ratio:**

  Many employees can treat **Many** patients.
- **Participation:**

  Employee **May** treat patients.

  Patient **Must** be treated by an employee.

Assign:

- **Description:**

  Employee assigns **Diagnosis** to **Patient**?

- **Degree:**

  3 Binary relations (out of ternary relation).

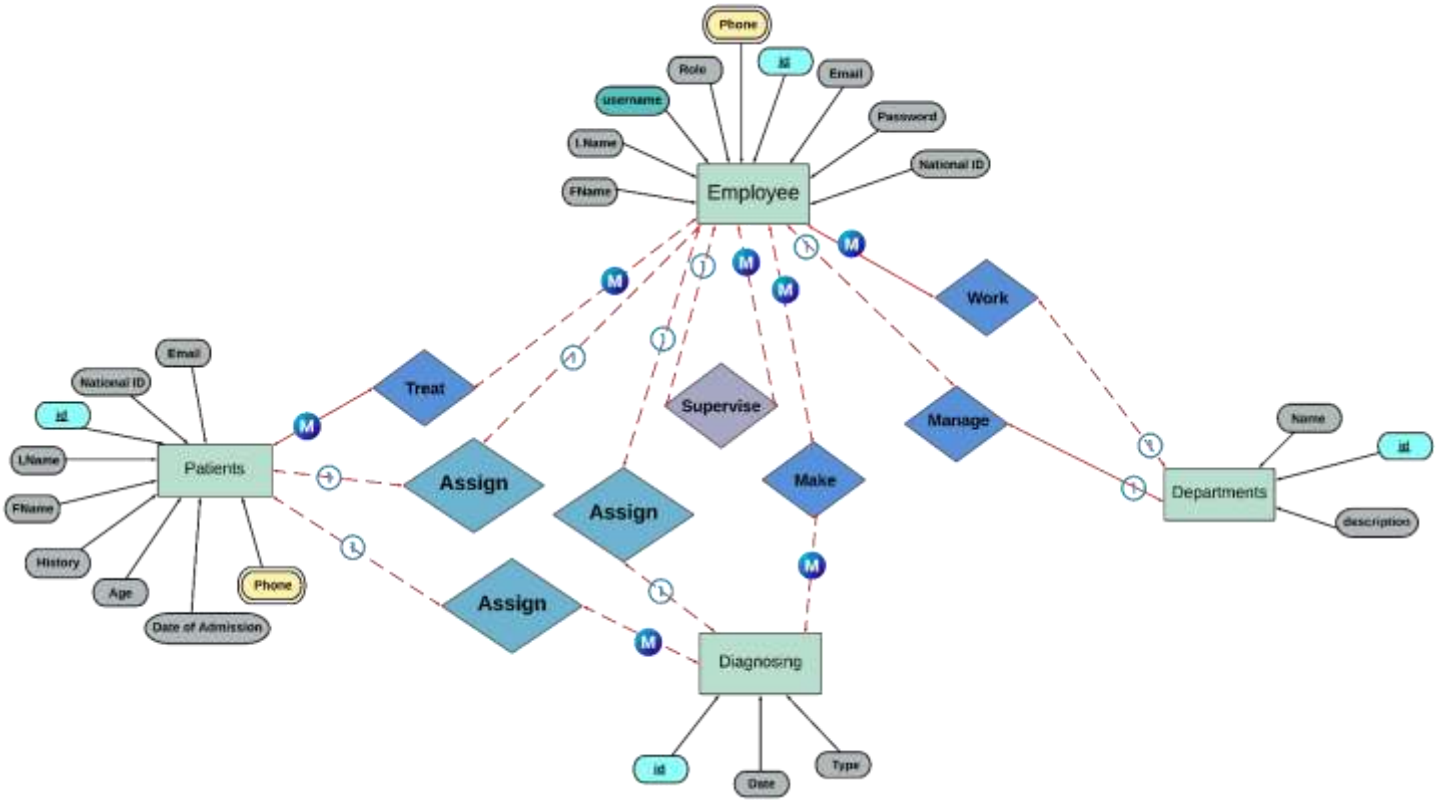
- **Ratio:**

  One employee can assign **Many** diagnoses to **One** patient.

- **Participation:**

  This operation **May** be done.

Entity Relation Diagram



Logical Scheme

Employee (id, Fname, Lname, username, role, phone, email, password, national_id, supervisor_id, department_id);

Department (id, name, description, manager_id);

Patient (id, Fname, Lname, national_id, email, history, age, admission_date, phone);

Diagnosis (id, date, type);

Assign_Diagnosis (emp_id, patient_id, diagnosis_id);

Treat (emp_id, patient_id);

Made_Diagnosis (emp_id, diagnosis_id);