**AIN SHAMS UNIVERSITY FACULTY OF ENGINEERING**

**CREDIT HOURS ENGINEERING PROGRAMS**

**Computer Engineering and Software Systems Program**

**"Ontologies & the Semantic Web"**

**"Term Project"**

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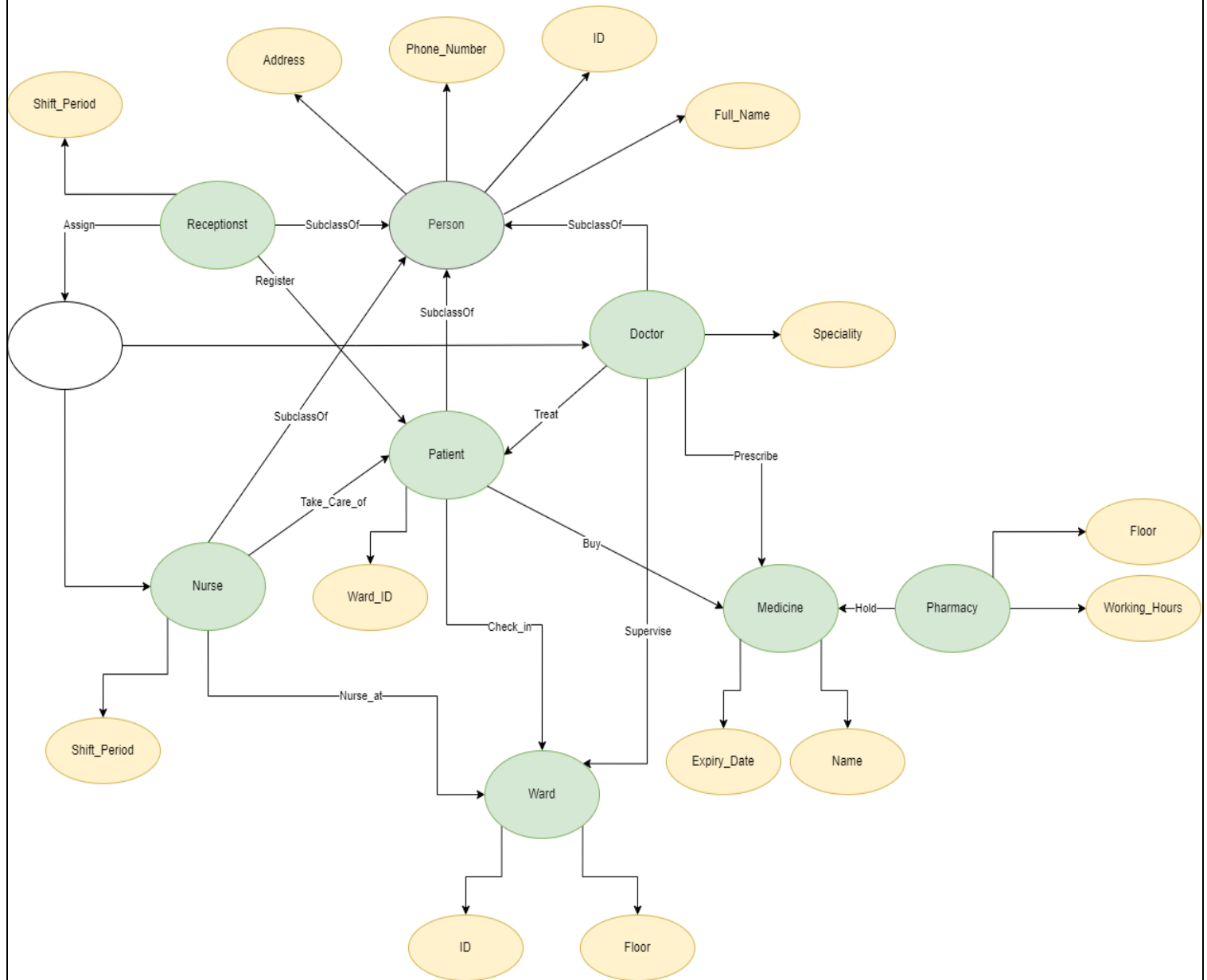
# Hospital Project

## 1. Problem Statement:

We are representing a case study of a "Hospital System" by means of Ontologies and Semantic Web.

The hospital system includes Doctors, Nurses, Patients, a Pharmacy, Receptionists, Medicines, and Wards.

The project will be implemented in "Owl" through Protégé and it will be illustrated in details through an RDF diagram, a detailed RDF description, entities cardinality constraints, and finally, we will show several examples for info that are extracted using SPARQL queries.

# 2. RDF Graph:

# 3. Detailed RDF Description:

## Classes:

Person

Doctor

Ward

Nurse

Pharmacy

Receptionist

Patient

Medicine

## Data Properties:

Person: Full_Name, Phone_Number, Address, ID

Doctor: Speciality

Patient: Ward_Id

Nurse: Shift_Period

Receptionist: Shift_Period

Ward: ID, Floor

Medecine: Expiry_Date, Name

Pharmacy: Floor, Working_Hours

# Object Properties:

Take_Care_of

Register

Treat

Assign

Nurse_at

Supervise

Buy

Prescribe

Hold

Check_in

# 4.Entities Cardinality Constraints:

- Doctor
  - prescribe min 1 Medicine
  - supervise min 1 Ward
  - treat max 3 Patient

- Nurse
  - nurse_at max 2 Ward
  - take_care_of max 4 Patient

- Patient
  - check_in exactly 1 Ward
  - buy min 1 Medicine

- Pharmacy
  - hold min 1 Medicine

- Receptionist
  - assign min 1 Doctor
  - assign min 1 Nurse
  - register min 1 Patient

- Ward
  - check_in max 6 Patient
  - nurse_at min 2 Nurse
  - supervise exactly 1 Doctor

# 5.SPARQL Queries:

- Query to extract Patients and their Doctor's names:



- Query to extract Patients, their Doctors and their Specialty:

- ## Query to extract Patients, their Address and Phone Number:



- ## Query to extract Patients, their Nurses and their Shifts:

- Query to extract Receptionists, their registered Patients and their Wards:



- Query to extract Receptionists, their Shifts and Phone Number:

- ## Query to extract Patients' Names:



- ## Query to extract Doctors' Names:

- # Query to extract Receptionist' Names:



- # Query to extract Nurses' Names: