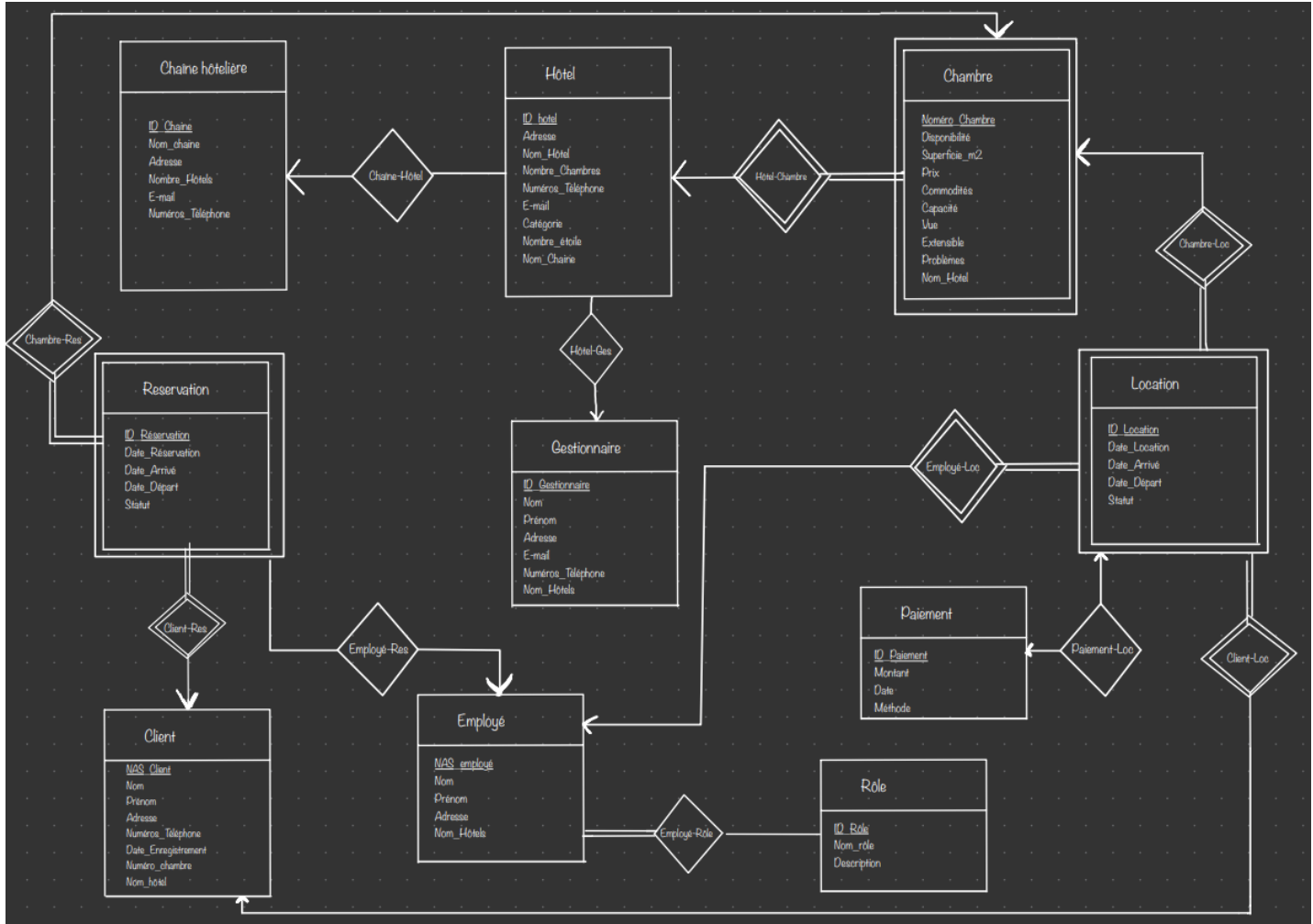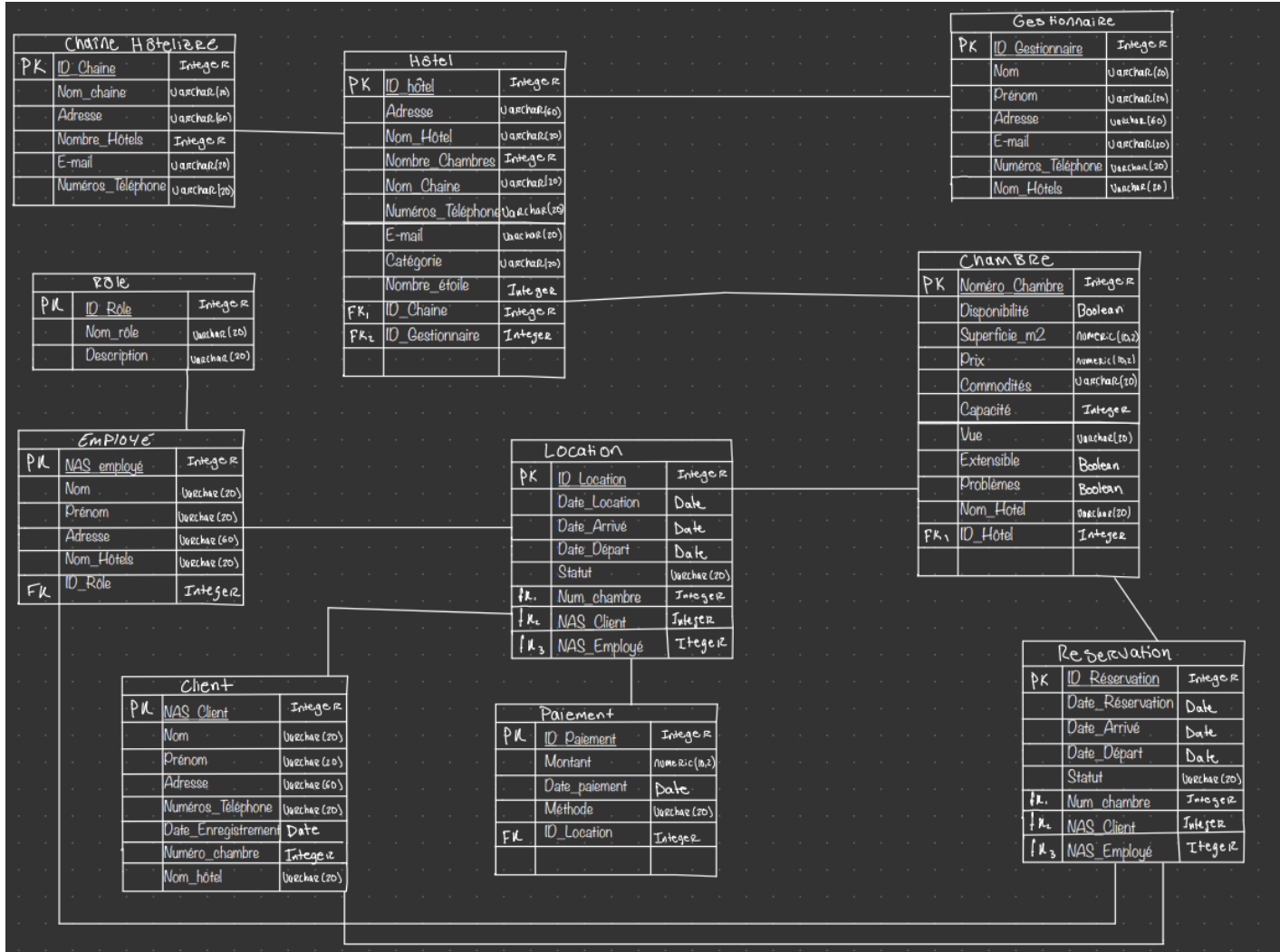# Entity Relationship Diagram

→ A Chaîne Hotelière entity is associated with multiple Hotel entities (1-N).

→ A Hotel entity is associated with multiple Chambre entities (1-N).

→ A Gestionnaire entity can be associated with multiple Hotel entities (1-N), but a hotel is associated with only one manager.

→ A Client, Chambre, or Employé entity can be associated with multiple Reservation entities (1-N). The Réservation entity is weak because its existence depends on the Client and Room entities.

→ A Client, Chambre, or Employé entity can be associated with multiple Location entities (1-N). The Location entity is weak because its existence depends on these three entities.

→ A Paiement entity is associated with a Location entity (1:1).

→ The participation of Employé in the Employé_Role relationship is total, while the participation of Role is partial. An employee must be associated with at least one role

Database Schema

→ A Hotel entity contains foreign keys referring to the Chaîne Hôtelière entity (ID_Chaîne)
and Gestionnaire (ID_Gestionnaire) due to the 1-N relationship.

→ A Chambre entity contains the foreign key referring to the Hôtel entity (ID_Hôtel) due to
the 1-N relationship.

→ The Réservation and Location entities contain foreign keys referring to the Chambre
(Numéro_Chambre), Client (NAS_client), and Employé (NAS_employé) entities due to
the 1-N relationships.

→ A Paiement entity contains the foreign key referring to the Location entity (ID_Location)
due to the 1-1 relationship.

→ An Employé entity contains the foreign key referring to the Rôle entity (ID_Rôle) due to
the (1,N – 1,1) relationship.

Constraints

Primary keys constraints:

→ The identifier must be unique for each Chaîne Hôtelière record.
→ The identifier must be unique for each Hôtel record.
→ The identifier must be unique for each Gestionnaire record.
→ The identifier must be unique for each Réservation record.
→ The identifier must be unique for each Location record.
→ The identifier must be unique for each Rôle record.
→ The identifier must be unique for each Paiement record.
→ The room number must be unique for each Chambre record.
→ The social security number (NAS) must be unique for each Client record.
→ The social security number (NAS) must be unique for each Employé record.

Referential integrity constraints:

→ A Nom_Chaîne value in a Hôtel record must also exist in a Chaîne Hôtelière record.
→ A Nom_Hôtel value in a Chambre record must also exist in a Hôtel record.
→ A Nom_Hôtel value in a Gestionnaire record must also exist in a Hôtel record.
→ A Nom_Hôtel value in an Employé record must also exist in a Hôtel record.
→ A Numéro_Chambre value in a Client record must also exist in a Chambre record.
→ A Nom_Hôtel value in a Client record must also exist in a Hôtel record.
→ Each Hôtel must be associated with a valid identifier from the Chaîne Hôtelière and Gestionnaire records.
→ Each Chambre must be associated with a valid identifier from a Hôtel record.
→ Each Réservation and Location must be associated with a valid room number from a Chambre record and valid NAS values from Client and Employé records.
→ Each Employé must be associated with a valid identifier from a Rôle record.
→ Each Paiement must be associated with a valid identifier from a Location record.

Domain constraints:

→ A Nombre_étoile value in a Hôtel record must be an integer from 1 to 5.
→ The value of capacité and superficie_m2 in a Chambre record must be a positive number.
→ The value of prix in a Chambre record must be a positive number.
→ The value of adresse in the corresponding records must have a valid format.
→ The value of numéro de téléphone in the corresponding records must have a valid format.
→ The value of dates must follow a valid format (e.g., dd-mm-yyyy).
→ The value of the email attribute in the Chaîne Hôtelière, Hôtel, and Gestionnaire records must have a valid format (e.g., must include the @ symbol).

User-defined constraints:

→ Registration must use a valid format for adresse, numéro de téléphone, and email.
→ The departure date must be later than the arrival date.
→ The client must follow a valid payment method according to the hotel.
→ A room cannot be reserved if it has already been booked for the same date.
→ The client must be over 18 years old.
→ The reservation duration cannot exceed 28 days.
→ A client must follow a certain number of days to cancel a reservation without penalties.
→ The number of clients reserved for a room cannot exceed the room's maximum capacity.