PROJECT PHASE - 3 (Data And Applications)

Team Number :- 4
Team Members :-

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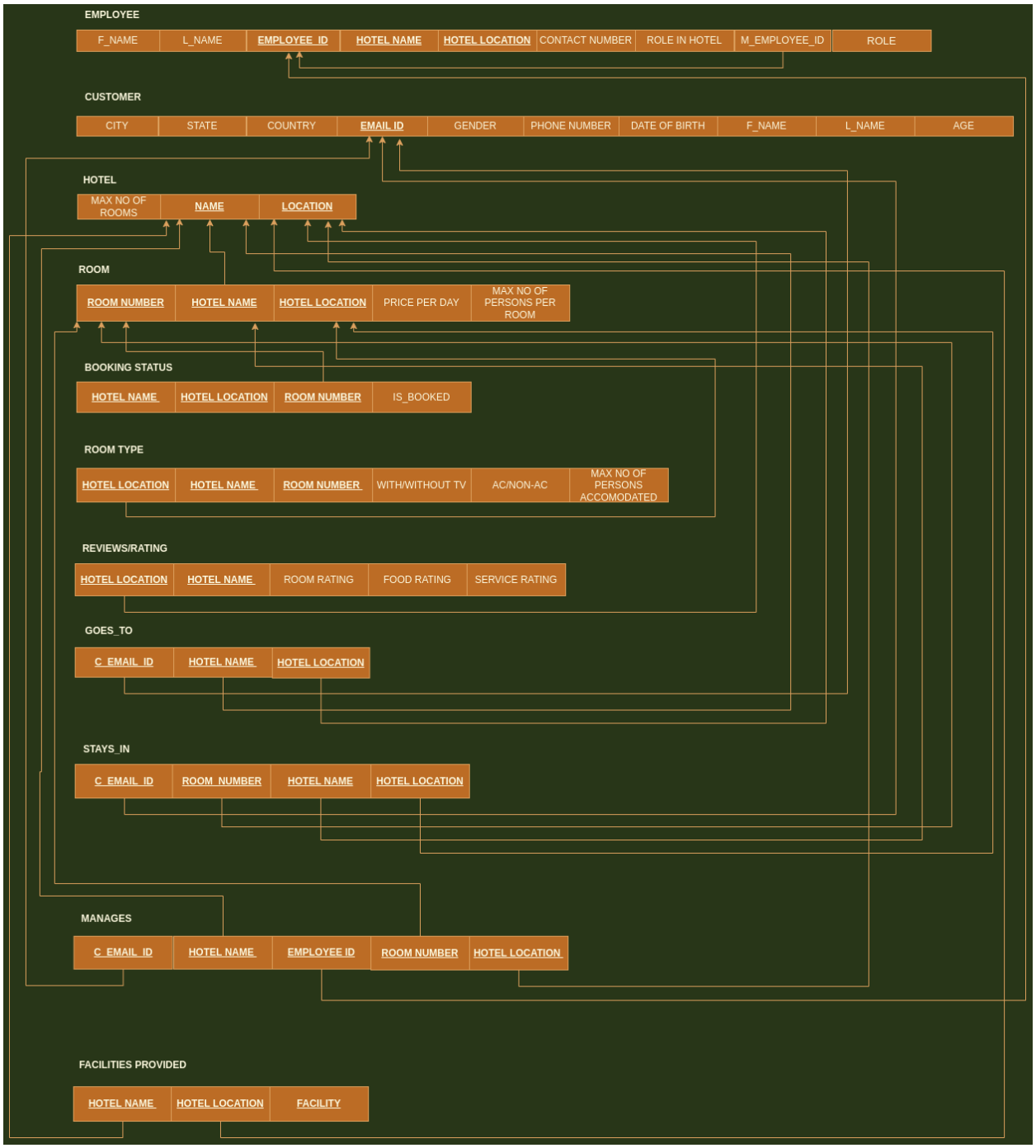
Step 1 :- Mapping ER to Relational Model

Note :-
In Book , for ER Diagram to Relational Model it was mentioned that multivalued_attributes should be kept as separate relation . This was only to be done in 1NF also .
So the below diagram is after conversion from ER to Relational Model and then to 1NF .


EMPLOYEE
F_NAME
L_NAME
EMPLOYEE_ID
HOTEL NAME
HOTEL LOCATION
CONTACT NUMBER
ROLE IN HOTEL
M_EMPLOYEE_ID
ROLE
CUSTOMER
CITY
STATE
COUNTRY
EMAIL ID
GENDER
PHONE NUMBER
DATE OF BIRTH
F_NAME
L_NAME
AGE
HOTEL
MAX NO OF ROOMS
NAME
LOCATION
ROOM
ROOM NUMBER
HOTEL NAME
HOTEL LOCATION
PRICE PER DAY
MAX NO OF PERSONS PER ROOM
BOOKING STATUS
HOTEL NAME
HOTEL LOCATION
ROOM NUMBER
IS_BOOKED
ROOM TYPE
HOTEL LOCATION
HOTEL NAME
ROOM NUMBER
WITH/WITHOUT TV
AC/NON-AC
MAX NO OF PERSONS ACCOMODATED
REVIEWS/RATING
HOTEL LOCATION
HOTEL NAME
ROOM RATING
FOOD RATING
SERVICE RATING
GOES_TO
C_EMAIL_ID
HOTEL NAME
HOTEL LOCATION
STAYS_IN
C_EMAIL_ID
ROOM_NUMBER
HOTEL NAME
HOTEL LOCATION
MANAGES
C_EMAIL_ID
HOTEL NAME
EMPLOYEE ID
ROOM NUMBER
HOTEL LOCATION
FACILITIES PROVIDED
HOTEL NAME
HOTEL LOCATION
FACILITY

- **Weak entity**
  - **Room Type** :- It has an identifying relationship(is_of) with room entity type . so the Hotel location is the primary key attribute of the Room relation which is included as an attribute in room_type and is referencing Hotel Location in room . Now the partial key (Hotel Name + Room Number)+Hotel Location is now the primary key of Room Type .
  - Similarly **Reviews/Rating** :- it has an identifying relationship(get) with the hotel . so now the primary key attribute of the hotel :- location **whose name is modified to hotel location** and kept as attribute in reviews/rating and it references location in Hotel .
    Now partial key (Hotel Name) + Hotel Location is the primary key of Reviews/Rating .
- **Relationship Types :-**
  - **Managing (between Employee , Employee):-** For this Employee Id of the manager is also added as an attribute and is named as **M_EMPLOYEEID** which references EMPLOYEEID in the employee relation .
  - **Has_1(between Room and Booking status) - 1:1 relation :-** Attribute Room Number in Booking Status references Room Number in Room relation .
  - **Has(between Room and Hotel) - 1:N relation :-** Attribute Hotel Name in Room references Name in Hotel relation .Here the n side is the Room
  - **Goes_to(between Customer and Hotel) :-** as this m:n relationship type a new relationship was drawn. customer email id name is changed to **c_email_id** references email_id in customer . And (hotel name +

hotel location) references name + location in Hotel relation .

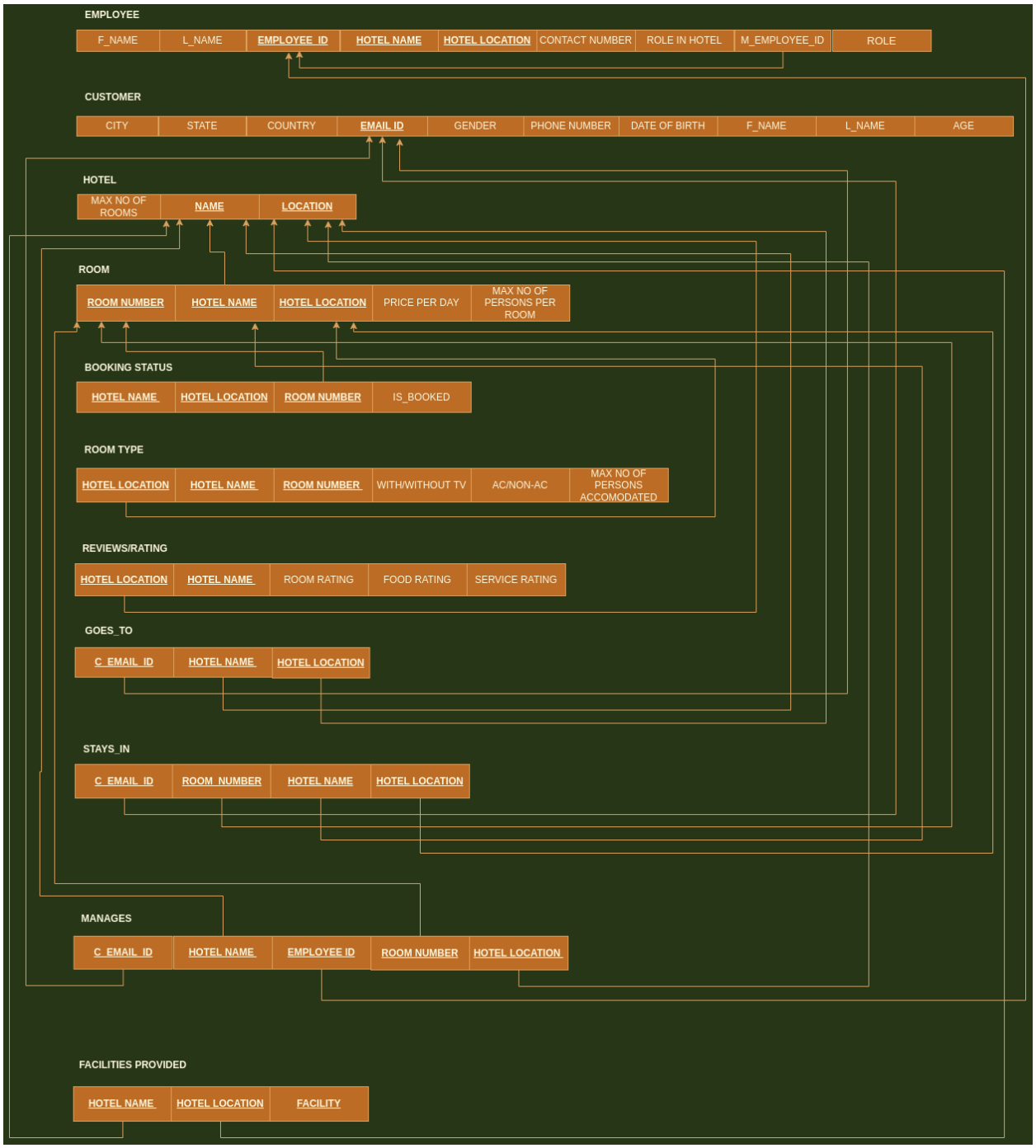
- **Stays_in(between Customer and Room) :-** for this also a new relation is given because it has m:n relationship. customer email id name is changed to **c_email_id** references email_id in customer . And (hotel name + hotel location + room number) references hotel name + hotel location + room number in Room relation .
- **Manages (degree > 3 relationship type):-** so this is also kept as relation and the primary keys of participating entity types as a whole kept as primary key in the new relation and they reference the primary key of the corresponding participating entity type .

- **MULTIVALUED ATTRIBUTE :-** facilities provided is also kept as a separate relation where the attribute **facility** along with the primary key attributes of the corresponding entity type is also kept as attributes in the relation referencing the primary key attributes of the participating entity type . All these attributes in the relation as a whole is the primary key of that relation .

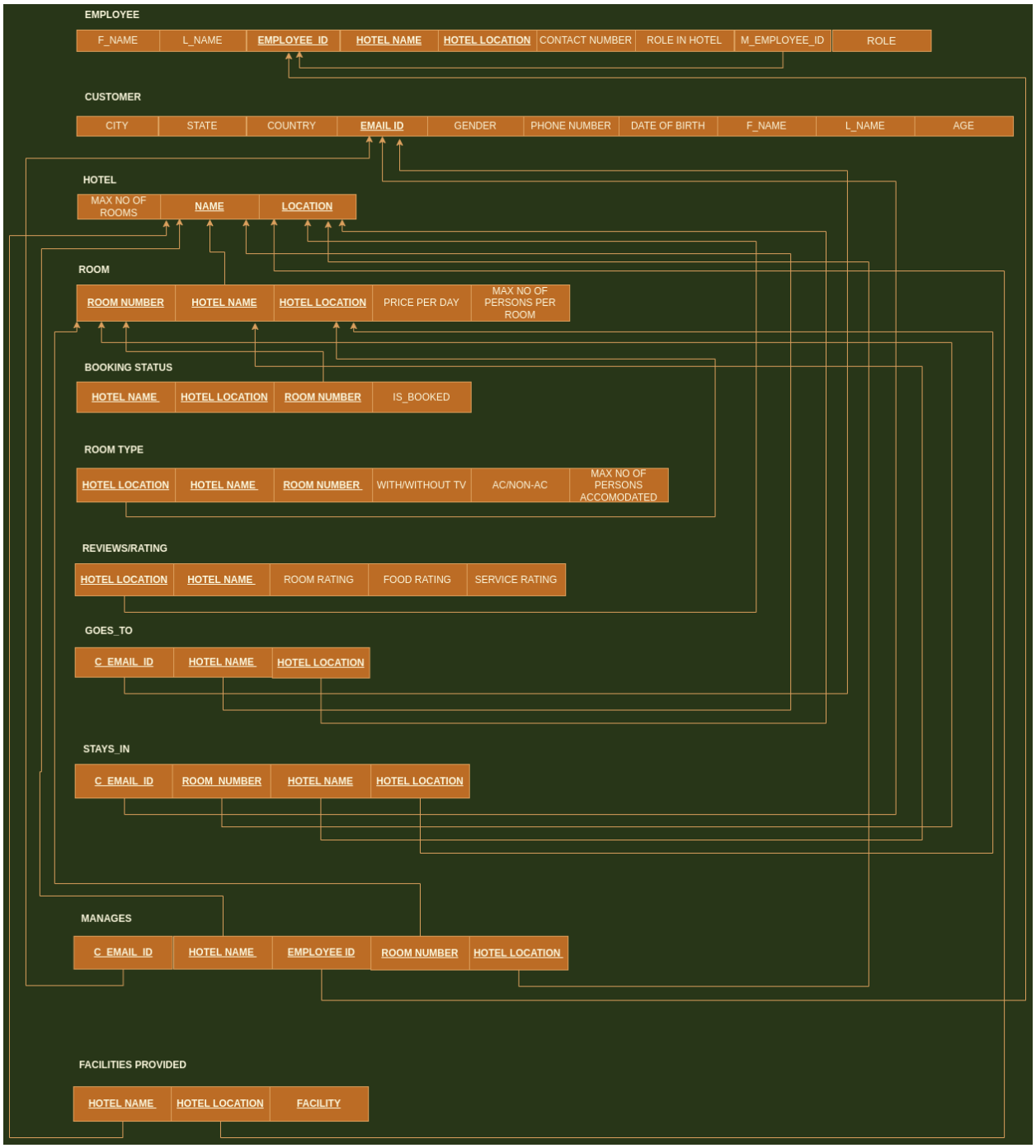
- Note :- An attribute **role** is added in employee relation for subclass in er diagram .

Step 2 :- Relational Model after conversion to 1NF

- **From the above note there is no change in relational model to 1NF diagram . so the diagram below is the same as the above .**



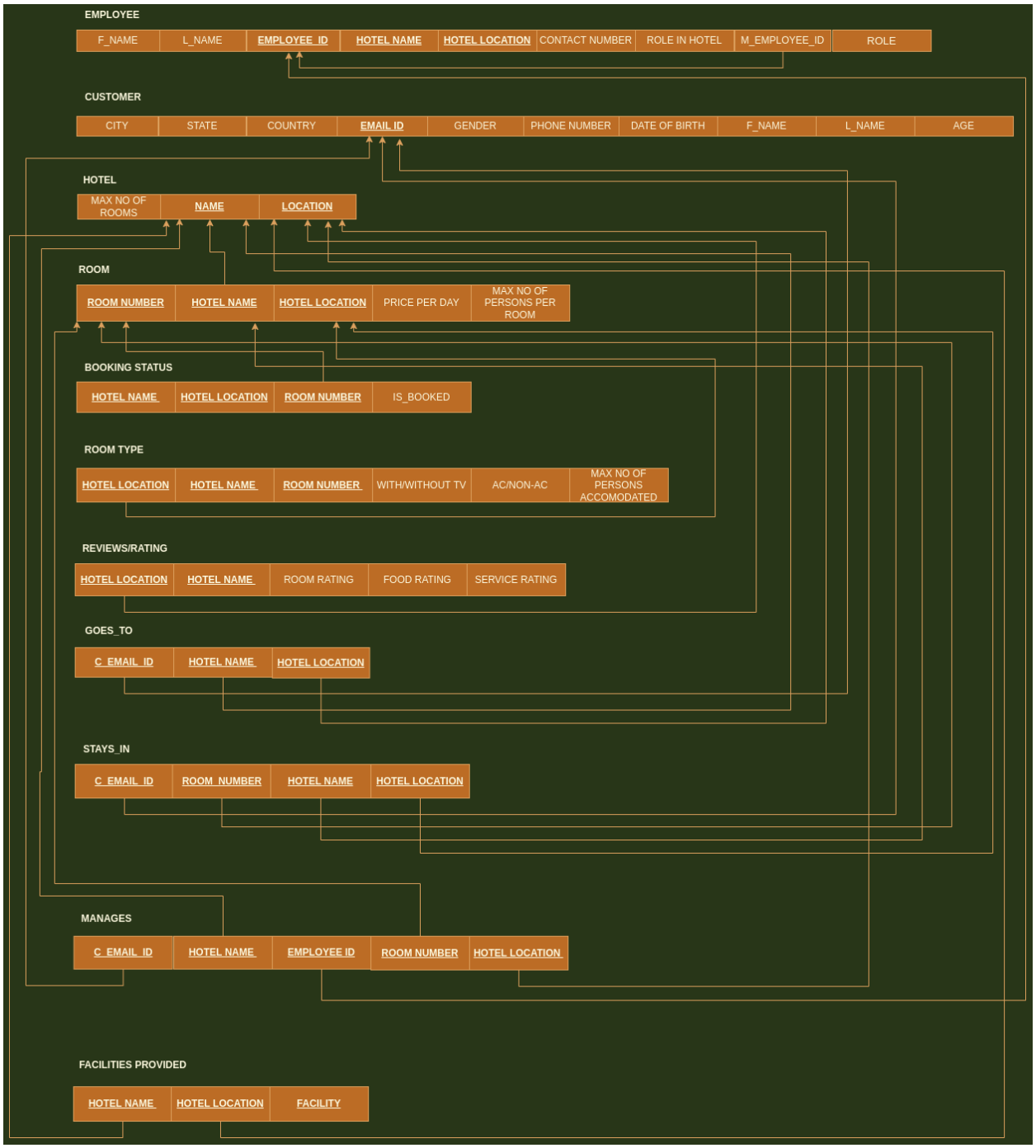
Step 3 :- Relational Model after conversion to 2NF



- **Already in 2NF , so no changes made .**
- **In employee , hotel , room , booking status , room type , reviews/rating the non prime attributes has full functional dependency on all the attributes of the primary key of their corresponding entity types . So no conversion needed .**
- **In customer there is only one primary key attribute so there is no need of converting it to 2NF .**
- **In Goes_To , STAYS_IN , MANAGES there is no non prime key attribute , So no conversion required .**

SEE NEXT PAGE FOR STEP 4

Step 4 :- Relational Model after conversion to 3NF



- **Already in** 3NF because there is no transitive dependency in any relation because all the non prime attributes have full functionally dependency on all the attributes of the primary key of the corresponding relation . Thus no non prime attributes have transitive dependency .