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Normalize Schema to 3NF/BCNF=

Entity and their Attributes=

1. Hostel_Branch:

- Attributes: {hostel_id, name, address, number_of_rooms, number_of_students}
- Primary Key: {hostel_id}

2. Rooms:

- Attributes: {room_number, capacity, hostel_id}
- Primary Key: {room_number}
- Foreign Key: hostel_id references Hostel_Branch (hostel_id)

3. Employees:

- Attributes: {employee_id, name, gender, phone_number, hostel_id, salary, date_of_join, date_of_leave}
- Primary Key: {employee_id, hostel_id}
- Foreign Key: hostel_id references Hostel_Branch (hostel_id)

4. Students:

- Attributes: {student_id, name, address, age, course, student_phone_number, dependent_phone_number, date_of_join, date_of_leave, hostel_id}
- Primary Key: {student_id, hostel_id}

- Foreign Key: hostel_id references Hostel_Branch (hostel_id)

5. **Student_room_assignment:**

- Attributes: {student_id, hostel_id, room_number}
- Foreign Key: student_id references Students(student_id), hostel_id referencing Hostel Branch(hostel_id), room_number references Rooms(room_number)

6. **Dependents:**

- Attributes: {student_id, dependent_phone_number, name, age, relation}
- Primary Key: {student_id}
- Foreign Key: student_id references Students(student_id)

7. **Fees:**

- Attributes: {student_id, date, amount, paid_till_date, pending, mode_of_payment}
- Primary Key: {student_id, date}
- Foreign Key: student_id references Students(student_id)

Changes made to the previous schema to normalize the schema to 3NF/BCNF=

- Removed the **student_id** attribute as it creates a partial dependency from Rooms table.
- Updated the primary key of Employees table and added the {employee_id, hostel_id} as a composite primary key.
- Updated the primary key of Students table and added the {student_id, hostel_id} as a composite primary key.
- Created a new table Student_room_assignment.
- Changed the primary key to {student_id}, as each student can have multiple dependents.

- Changed the primary key to {student_id, date}, as each student can have multiple fee entries on different dates.

Relationships=

1. 'Hostel_Branch' has 'Rooms' = One-to-Many Relationship
2. 'Students' are assigned to 'Rooms' = Many-to-Many (changed due to 'Student_room_assignment')
3. 'Students' depend on 'Dependents' = One-to-One Relationship
4. 'Students' pays 'Fees' = One-to-Many Relationship
5. 'Hostel_Branch' has 'Employees' = One-to-Many Relationship

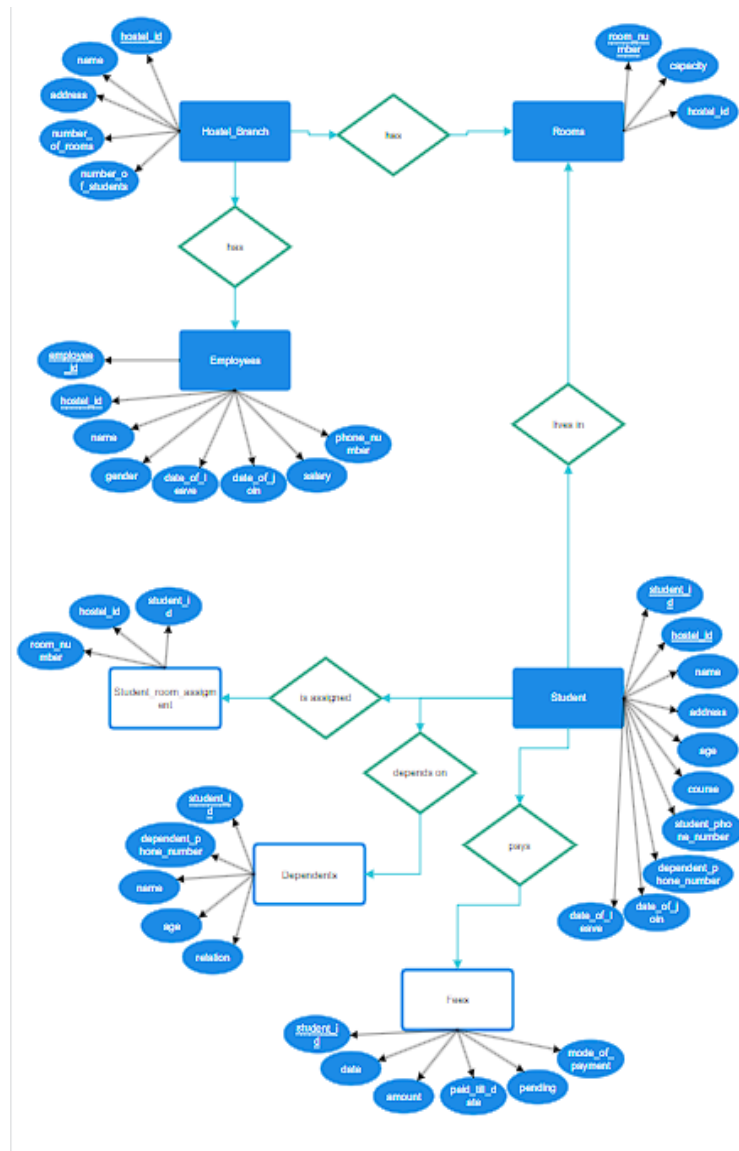


Fig- ER Diagram