Constraints

1. **Primary Keys:** Primary keys uniquely identify each record in a table.
2. **Foreign Keys:** Foreign keys establish a link between tables, ensuring data integrity by requiring that the values in one table match values in another table.
3. **Check Constraints:** These constraints ensure specific conditions are met within individual columns, enforcing rules on what data can be entered to a maintain accuracy.
   - **Age Constraint:** The **Age** column in the **Student** table is restricted to a range between **16 and 24**. This ensures that students fall within a certain age bracket, keeping entries relevant to the typical demographic of a college hostel.
   - **Category Constraint:** The **Category** column in the **Student** table is limited to specific categories, such as **DASA, Outside Delhi, Inside Delhi,** and **Transfer Case**. This ensures uniformity in the categories, reducing the risk of invalid or inconsistent entries.
   - **Program Constraint:** The **Program** column in the **Student** table is constrained to valid academic programs like **BBA, B.DES,** AND **B.TECH**. This constraint prevents data entry errors by restricting entries to recognized program names.
   - **Hostel Name Constraint:** In the **Hostel** table, the hostel **Hostel_Name** colum is limited to specific values (**Kaveri, Alaknanda,** and **Saraswati**). This keeps hostel names consistent across records and helps avoid spelling errors or unrecognized hostel names in the database.
   - **Room Type Constraint:** The **Type_of_Room** column in the **Hostel** table is set to values representing the capacity of each room between **2 and 4**.
   - **CGPA Constraint:** In the **Kaveri_Student** table, the **CGPA** column is constrained to a range between 7.00 and 10.00. This sets a minimum academic standard for Kaveri students.
   - **Contact Info Constraint:** For **Contact_Info** in the **Staff, Parent**, and **Student** tables, a format constraint ensures each entry is exactly 10 digits. This maintains consistency in contact numbers, allowing only valid phone numbers to be stored.

Assertions

Assertions are more general constraints that apply to multiple tables and enforce complex conditions across the database.

1. **Room Capacity Assertion:** This assertion checks that the current capacity of each room in the **Room** table does not exceed the designated room capacity specified in the **Hostel** table.

Triggers

Triggers are automated database actions that execute in response to specific events, like inserting, updating, or deleting records.

- **Room Capacity Trigger:** This trigger automatically updates the **Current_Capacity** in the **Room** table whenever a new student is added. When a record is inserted into the **Student** table, the trigger increases the **Current_Capacity** of the assigned room.