**Normalization Process**

**Step 1: Unnormalized Form (UNF)**

In UNF, the data may include repeating groups and non-atomic values. From the ERD, we can see that all attributes are atomic, and no multivalued fields are present, so we begin with structured data suitable for 1NF.

**Step 2: First Normal Form (1NF)**

**1NF Criteria**:

* Atomic attributes (no lists or sets)
* Each record is uniquely identifiable

We separate all entities into their own tables with clearly defined primary keys.

**Tables in 1NF**:

1. **Club** (ClubID, VenueName, Capacity)
2. **Artist** (ArtistID, ArtistName, Nationality, ArtistPhoneNumber)
3. **Event** (EventID, EventName, EventDate, SeatNumber, TicketPrice, EventStatus, ClubID, ArtistID)
4. **Booking** (BookingID, TicketNumber, AmountToBePaid, BookingStatus, BookingDate, RefundAmount, RefundDate, EventID)
5. **Payment** (PaymentID, PaymentDate, PaymentMethod, PaymentAmount, AccountID, BookingID)
6. **Account** (AccountID, AccountName, Email) *(Inferred from AccountID used in Payment table)*

**Step 3: Second Normal Form (2NF)**

**2NF Criteria**:

* Meet First Normal Form (1NF)
* No partial dependency (all non-key attributes fully depend on the whole primary key)

Since all primary keys are atomic (i.e., not composite), each table in 1NF already meets 2NF.

**Step 4: Third Normal Form (3NF)**

**3NF Criteria**

To be in Third Normal Form (3NF), a table must:

* Already meet the requirements of Second Normal Form (2NF)
* Have no transitive dependencies (i.e. non-key attributes should not depend on other non-key attributes)

Let’s have a look at each table to check for any transitive dependencies:

🔸 **Club**  
There are no transitive dependencies in this table.  
This table is already in 3NF.

🔸 **Artist**  
All non-key attributes directly depend on the primary key. No transitive dependencies found.  
This table is in 3NF.

🔸 **Event**  
Both ClubID and ArtistID are foreign keys, and the rest of the attributes depend only on EventID.  
The table satisfies 3NF.

🔸 **Booking**  
EventID is a foreign key, and all other fields are dependent on BookingID.  
This table is in 3NF as well.

🔸 **Payment**  
This table includes AccountID and BookingID as foreign keys, while all other attributes are directly related to PaymentID.  
No transitive dependencies so it's in 3NF.

🔸 Account  
There are no derived or transitive attributes in this table.  
It also meets the criteria for 3NF.

**Final Tables (3NF)**

| **Table** | **Attributes** |
| --- | --- |
| **Club** | ClubID (PK), VenueName, Capacity |
| **Artist** | ArtistID (PK), ArtistName, Nationality, ArtistPhoneNumber |
| **Event** | EventID (PK), EventName, EventDate, SeatNumber, TicketPrice, EventStatus, ClubID (FK), ArtistID (FK) |
| **Booking** | BookingID (PK), TicketNumber, AmountToBePaid, BookingStatus, BookingDate, RefundAmount, RefundDate, EventID (FK) |
| **Payment** | PaymentID (PK), PaymentDate, PaymentMethod, PaymentAmount, AccountID (FK), BookingID (FK) |
| **Account** | AccountID (PK), AccountName, Email |