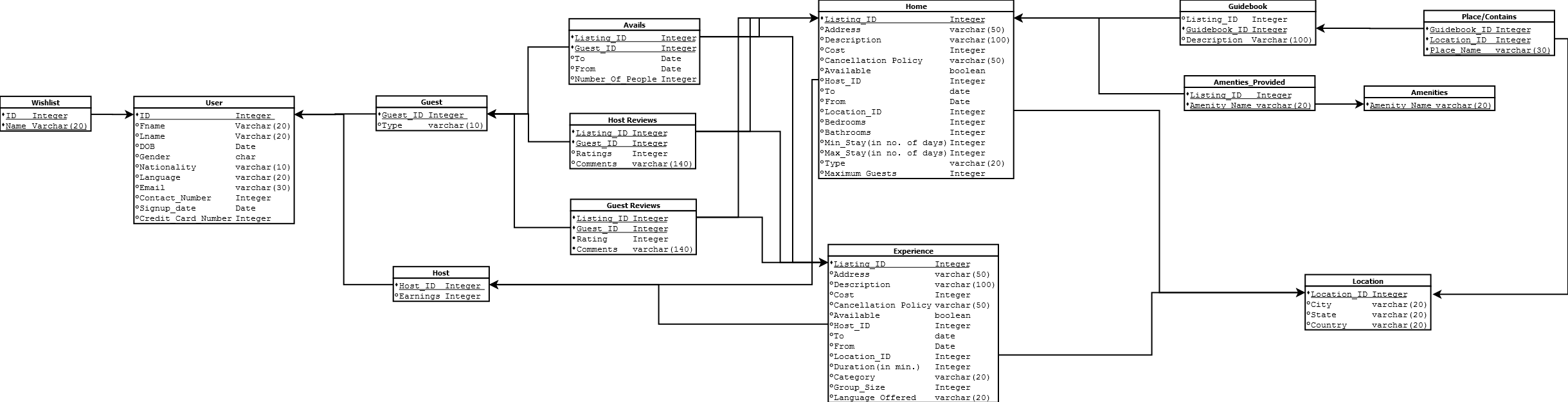
**Relational Schema Diagram**



**Functional Dependencies and proof of BCNF.**

1. **WishList (ID ,Name)**

Key:{ID,Name}

FD: No FDs . Because both attributes make composite key. Hence the BCNF is

formally satisfied since there are no FDs.

1. **User(ID,Fname,Lname,DOB,Gender,Nationality,Language,Email,Contact No, Signup date, Credit Card No)**

Key: ID

FD:

ID → Fname

ID → Lname

ID → DOB

ID → Gender

ID → Nationality

ID → Language

ID → Email

ID → Contact No.

ID → Signup date

ID → Credit Card No

Here, ​ID ​​is the primary key, and for every FD X → Y that holds on a relation, X is key, where X is

ID. Hence this relation is in BCNF.

1. **Guest(Guest\_ID,Type)**

Key: Guest\_ID

FD:

Guest\_ID → Type

Here, ​Guest\_ID ​​is the primary key, and for every FD X → Y that holds on a relation, X is key, where X is

Guest\_ID. Hence this relation is in BCNF.

1. **Host (Host\_ID,Earning)**

Key:Host\_ID

FD:

Host\_ID → Earning

Here, ​Host\_ID ​​is the primary key, and for every FD X → Y that holds on a relation, X is key, where X is

Host\_ID. Hence this relation is in BCNF.

1. **Avails(Listing\_ID,Guest\_ID,To ,From,No of people)**

Key:{Listing\_ID, Guest\_ID}

FD:

{Listing\_ID,Guest\_ID} → To

{Listing\_ID,Guest\_ID} → From

{Listing\_ID,Guest\_ID} → No of people

Here, ​{Listing\_ID,Guest\_ID} ​​is the primary key, and for every FD X → Y that holds on a relation, X is key, where X is {Listing\_ID,Guest\_ID}. Hence this relation is in BCNF.

**6.Guest Reviews (Listing\_ID,Guest\_ID, Comments,Rating)**

Key: {Listing\_ID,Guest\_ID}

FD:

{Listing\_ID,Guest\_ID} → Comments

{Listing\_ID,Guest\_ID} → Rating

Here, {Listing\_ID,Guest\_ID} ​​is the primary key, and for every FD X → Y that holds on a relation, X is key, where X is {Listing\_ID,Guest\_ID}. Hence this relation is in BCNF.

**7. Host Reviews (Listing\_ID,Guest\_ID, Comments,Rating)**

Key: {Listing\_ID,Guest\_ID}

FD:

{Listing\_ID,Guest\_ID} → Comments

{Listing\_ID,Guest\_ID} → Rating

Here, {Listing\_ID,Guest\_ID} ​​is the primary key, and for every FD X → Y that holds on a relation, X is key, where X is {Listing\_ID,Guest\_ID}. Hence this relation is in BCNF.

We decomposed review table into guest and host review to differentiate between host reviewing guests and guests reviewing host.

Also Host\_ID is removed, as Host\_ ID is implicitly found out from Listing\_ID .

Also the occurrence of FD

Listing\_ID → Host\_ID

results in the relation not being BCNF . Decomposition algorithm hints towards the creation of listing table which is already there.

**8.Home(Listing\_ID,Address,Description,Cost,Cancellation\_Policy,Available,Host\_ID,To,From,Location\_ID,Bedroom,Bathroom,Min\_Stay,Max\_Stay,Type,Maximum\_Guests)**

Key: Listing\_ID

FD:

Listing\_ID → Address

Listing\_ID → Description

Listing\_ID → Cost

Listing\_ID → Cancellation\_Policy

Listing\_ID → Available

Listing\_ID → Host\_ID

Listing\_ID → To

Listing\_ID → From

Listing\_ID → Location\_ID

Listing\_ID → Bedroom

Listing\_ID → Bathroom

Listing\_ID → Min\_Stay

Listing\_ID → Max\_Stay

Listing\_ID → Type

Listing\_ID → Maximum\_Guest

Here, ​Listing\_ID ​​is the primary key, and for every FD X → Y that holds on a relation, X is key, where X is Listing\_ID. Hence this relation is in BCNF.

**9.Experience(Listing\_ID,Address,Description,Cost,Cancellation\_Policy,Available,Host\_ID,To,From,Location\_ID,Duration,Category,Group\_Size,Language\_Offered)**

Key: Listing\_ID

FD:

Listing\_ID → Address

Listing\_ID → Description

Listing\_ID → Cost

Listing\_ID → Cancellation\_Policy

Listing\_ID → Available

Listing\_ID → Host\_ID

Listing\_ID → To

Listing\_ID → From

Listing\_ID → Location\_ID

Listing\_ID → Duration

Listing\_ID → Category

Listing\_ID → Group\_Size

Listing\_ID → Language\_Offered

Here, ​Listing\_ID ​​is the primary key, and for every FD X → Y that holds on a relation, X is key, where X is Listing\_ID. Hence this relation is in BCNF.

**10. Guidebook (Guidebook\_ID, Description, Listing\_ID)**

Key: Guidebook\_ID

FD:

Guidebook\_ID → Description

Guidebook\_ID → Listing\_ID

Here, Guidebook\_ID ​​is the primary key, and for every FD X → Y that holds on a relation, X is key, where X is Guidebook\_ID. Hence this relation is in BCNF.

**11. Amenities Provided (Listing\_ID, Amenity\_Name)**

Key: {Listing\_ID, Amenity\_Name)

FD: No FDs . Because both attributes make composite key. Hence the BCNF is

formally satisfied since there are no FDs.

**12. Amenities (Amenity\_Name)**

Key: Amenity\_Name

FD: No FDs . Because there is a single attribute which is the key. Hence the BCNF is

formally satisfied since there are no FDs.

**13. Place/Contains(Guidebook\_ID,Location\_ID,Place\_Name)**

Key: {Guidebook\_ID,Location\_ID,Place\_Name}

FD: No FDs . Because the combination of all the attributes is the key. Hence the BCNF is

formally satisfied since there are no FDs.

**14.Location (Location\_ID,City,State,Country)**

Key:Location\_ID

FD:

Location\_ID → City

Location\_ID → State

Location\_ID → Country

Here, Location\_ID ​​is the primary key, and for every FD X → Y that holds on a relation, X is key, where X is Location\_ID. Hence this relation is in BCNF.