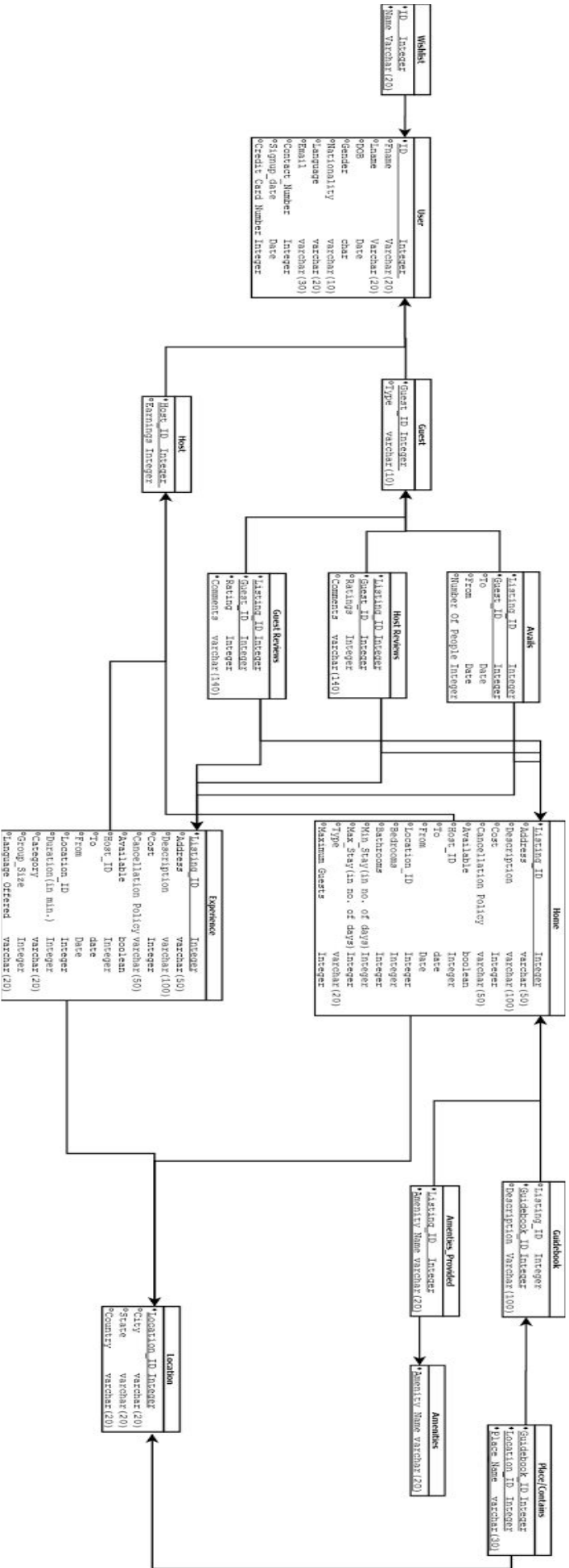


Relational Schema Diagram



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.

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

Key: ID

FD:

ID \rightarrow Fname

ID \rightarrow Lname

ID \rightarrow DOB

ID \rightarrow Gender

ID \rightarrow Nationality

ID \rightarrow Language

ID \rightarrow Email

ID \rightarrow Contact No.

ID \rightarrow Signup date

ID \rightarrow Credit Card No

Here, ID is the primary key, and for every FD $X \rightarrow Y$ that holds on a relation, X is key, where X is ID. Hence this relation is in BCNF.

3. Guest(Guest_ID,Type)

Key: Guest_ID

FD:

Guest_ID \rightarrow Type

Here, Guest_ID is the primary key, and for every FD $X \rightarrow Y$ that holds on a relation, X is key, where X is Guest_ID. Hence this relation is in BCNF.

4. Host (Host_ID, Earning)

Key: Host_ID

FD:

Host_ID \rightarrow Earning

Here, Host_ID is the primary key, and for every FD $X \rightarrow Y$ that holds on a relation, X is key, where X is Host_ID. Hence this relation is in BCNF.

5. Avails(Listing_ID, Guest_ID, To, From, No of people)

Key: {Listing_ID, Guest_ID}

FD:

{Listing_ID, Guest_ID} \rightarrow To

{Listing_ID, Guest_ID} \rightarrow From

{Listing_ID, Guest_ID} \rightarrow No of people

Here, {Listing_ID, Guest_ID} is the primary key, and for every FD $X \rightarrow Y$ 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} \rightarrow Comments

{Listing_ID, Guest_ID} \rightarrow Rating

Here, {Listing_ID, Guest_ID} is the primary key, and for every FD $X \rightarrow Y$ 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} \rightarrow Comments

{Listing_ID, Guest_ID} \rightarrow Rating

Here, {Listing_ID, Guest_ID} is the primary key, and for every FD $X \rightarrow Y$ 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 \rightarrow 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 \rightarrow Address

Listing_ID \rightarrow Description

Listing_ID \rightarrow Cost

Listing_ID \rightarrow Cancellation_Policy

Listing_ID \rightarrow Available

Listing_ID \rightarrow Host_ID

Listing_ID \rightarrow To

Listing_ID \rightarrow From

Listing_ID \rightarrow Location_ID

Listing_ID \rightarrow Bedroom

Listing_ID \rightarrow Bathroom

Listing_ID \rightarrow Min_Stay

Listing_ID \rightarrow Max_Stay

Listing_ID \rightarrow Type

Listing_ID \rightarrow Maximum_Guest

Here, Listing_ID is the primary key, and for every FD $X \rightarrow Y$ 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 \rightarrow Address

Listing_ID \rightarrow Description

Listing_ID \rightarrow Cost

Listing_ID \rightarrow Cancellation_Policy

Listing_ID \rightarrow Available

Listing_ID \rightarrow Host_ID

Listing_ID \rightarrow To

Listing_ID \rightarrow From

Listing_ID \rightarrow Location_ID

Listing_ID \rightarrow Duration

Listing_ID \rightarrow Category

Listing_ID \rightarrow Group_Size

Listing_ID \rightarrow Language_Offered

Here, Listing_ID is the primary key, and for every FD $X \rightarrow Y$ 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 \rightarrow Description

Guidebook_ID \rightarrow Listing_ID

Here, Guidebook_ID is the primary key, and for every FD $X \rightarrow Y$ 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 \rightarrow City

Location_ID \rightarrow State

Location_ID \rightarrow Country

Here, Location_ID is the primary key, and for every FD $X \rightarrow Y$ that holds on a relation, X is key, where X is Location_ID. Hence this relation is in BCNF.