5th Assignment Report

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By examining all the tables of our database we conclude that some of them are not in BNCF so **the Database itself is not in BCNF**. This is due to the large amount of data as this creates some non-trivial dependencies on some of our tables. Especially in Location, Review, Review-Summary, Listing_Summary and Geolocation tables these dependencies make it impossible to establish the 3rd normal form, hence BCNF.

Further below we examine in detail the dependencies of each table to determine which of them are in BCNF and which are not.

Regarding the **Amenity** table we notice that there are only 2 columns so the only relation that exists is A -> B, where each amenity_id specifies each amenity_name, so this table is in **BCNF**.

In **Calendar table** all tuples can be specified by listing_id and date, as we can export all booking features such as availability and fixed price, so this table is in **BCNF**.

In **Geolocation** table there is a relation between the coordinates and geometry_type as the field describes the scheme which results form the number of coordinates. So this table is **neither in 3rd Normal Form, nor in BCNF.**

In **Host** table all fields depend on the identity of the host, such as the name and location. Listing is also in **BCNF** because fields that previously did not meet the BCNF requirements, were deleted and placed in new tables. This means that from the apartment id we can extract information such as neighborhood, owner ID and reviews rating. On the other hand, **Listing_Summary** is **not in BCNF** due to non trivial relationship between latitude, longitude and neighborhood.

In the **Review** table we can specify all fields just with the date and id columns, but we still have a non-trivial relationship between host_id and name, so this table is **not in BCNF**. It is worth noting that **Review_Summary** table is not even in 1NF because there is no Primary Key.

A similar pattern is observed in **Location** table, as we can identify the city, zipcode … etc. columns via latitude and longitude. So this table is **not in BCNF.**

The **Room** and **Price** tables have the same dependencies, with their superkey being the code of the apartment. They end up with information related to their title. So both of these tables are in **BCNF.**

The **Neighborhood** table technically has only 1 column, so it is in **BCNF**.

Finally the **Room_connects_with_Amenity** table is in **BCNF** because there is no violation of normal form rules.

As mentioned above, 5 tables are not in BCNF, so **the Database is not in BCNF** as well.