users PK = {name, surname}

users F: {is\_verified -> name surname}

users is in BCNF

private\_info PK = {email}

private\_info F: {password phone\_number address name surname -> email, postal\_code -> address}

ONLT IN 2NF as address is transitively dependent on the PK

baskets PK: {id}

baskets F: {filter order\_asc notify -> id}

baskets is in BCNF

credit\_cards PK: {number}

credit\_cards F: {month year security\_code name surname -> number}

credit\_cards is in BCNF

coupons PK: {code}

coupons F: {discount\_percentage -> code}

coupons is in BCNF

categories PK: {id}

categories F: {title image\_path description parent\_id -> id}

categories is BCNF

items PK: {id}

items F: {name image\_path price stock -> id}

items is in BCNF

baskets\_users, categories\_items, pay\_credit\_cards, pay\_baskets, pay\_coupons relations have only trivial FDs and thus are in BCNF.

To make private\_info 3NF, we have to move all items involved in transitive dependencies to a new entity. So,

FD that violates 3NF: postal\_code -> address

Old Schema: private\_info(email, password, phone\_number, postal\_code, address, name, surname)

New Schema: addresses(address, postal\_code)

New Schema: private\_info(email, password, phone\_number, address, name, surname)

Now private\_info relation is in BCNF and addresses relation is in BCNF. I also added an extra field “date” in pay table so that we can know when any payment process happened. And I decided to change the name of the “private\_info” table to be just “contact\_info”. It didn’t make sense in context of business logic that a user may have more than one password. Now email and password are stored in the “users” table, and “private\_info” is renamed as “contact\_info”, serving the purpose of user being able to add more than one contact info. Also email is the new primary key for the “users” table. Also all occurrences of (name, surname) combination being used as the foreign key for users is updated with email.

New final complete relation schema that is in BCNF:

users(name, surname, is\_verified)

addresses(address, postal\_code)

private\_info(email, password, phone\_number, address, name, surname)

baskets(id, filter, order\_asc, notify)

credit\_cards(number, month, year, security\_code, name, surname)

coupons(code, discount\_percentage)

categories(id, title, image\_path, description, parent\_id)

items(id, name, image\_path, price, stock)

pay(id, created\_at)

baskets\_users(basketID, name, surname)

baskets\_items(basketID, itemID)

categories\_items(categoryID, itemID)

pay\_credit\_cards(number, payID)

pay\_baskets(basketID, payID)

pay\_coupons(code, payID)