Homework 1

A few undergraduate students would like to build a startup. Their main idea is to build a decentralized farmer market. To this end, they gather the following application requirements:

1. (done)Farmers have a name, last name, address, zip code, city, phone number and e-mail address. Each farmer may have multiple phone numbers and e-mails.
2. (done)Farmers produce some products. The quantity of product changes each year.
3. (done)Each product has a name, plantation starts date, harvest date, hardness level (i.e., whether it is easy to carry or not), altitude level and min temperature that it can grow.
4. (done)The local markets sell the products to the customers. The markets have a name, address, zip code, city, phone number and a budget.
5. The startup has a website showing all products to the markets. The products are listed in the website with the following information: the origin of product (city), quantity, price, the farmers name and last name.
6. The local markets buy the products from the website of startup. The website shows all the products available to the markets. The transaction can only be completed with the mandatory fields amount of product sold and the price, and the credit card(s) of local markets.
7. The farmers register their products to the website. During registration, the farmers provide their IBAN numbers so that the startup deposit the value of products sold in the website.

The following functional dependencies are known by the students:

* Address -> zip code(2/2)(done)
* zip code -> city(2/2)(done)
* phone number -> name, last name(done)
* plantation start date -> harvest date(done)
* altitude level -> min temperature(done)
* credit card -> market name(done)

Please do the followings for the conceptual design;

1. Draw an ER diagram(done)
2. Convert it to the relational model. State each relation with its primary, candidate and foreign keys. And if an attribute cannot be null, state it.(done)
3. Prove that each relation is anomaly free so that we can perform insert/update and delete operations without any problem.
4. The startup is planning to make money by marketing research. Please write SQL queries for the following queries(done)
   1. Find the names of farmers who produces most for each product. (done)
   2. Find the names of farmers who produces most grain for each city. (done)
   3. Find the pairs of products that can be grown in the same year (their plantation starts date and harvest date do not intersect)
   4. Find the names of farmers who sells most for each product in the website. (d)
   5. Find the names of farmers who sells most grain for each city in the website. (d)
   6. Find the name(s) of farmers who make most money. (d)
   7. Find the names of farmers who sell products more than they produces(d)
   8. Find the names of markets with the biggest budget in each city. (done)
   9. Find the names of markets who buys most for each product type.(done)
   10. List 3 products that the website makes most money so that these products are going to be advertised. (done)
   11. Find the names of markets who buys products costing higher than their budgets
   12. Find the total number of users of website.(done)
5. Write create table statement of each relation with the corresponding triggers and constraints/assertions. (done)

Bring the answers written on a A4 paper on April 21th, 2019. Late submissions are going to be penalized with 10 points each day. Please form groups by two people.