Homework 2

In the second homework, the students start implementation of their startup. To this end, they are going to create a database system, where all data is stored in a DBMS, and the startup functionalities are going to be implemented in a desktop application. The application will accept only one command from command-line at a time, and perform the operations as stated below, and return. The name of the program must be "homework2", and should be able to run in TAs computer with all dependencies. RDBMS is going to run on your computer, so please configure homework2 to run on remote DBs. Thus, please test your program in another machine.

1. (15 points) The students use a RDBMS. You can use any RDBMS as long as it supports transaction support (e.g., commit, rollback, etc). See the following links for RDBMS options.
    a. SQLite: https://www.sqlite.org/
    b. PostgreSQL: https://www.postgresql.org/
    c. MySQL: https://www.mysql.com/

The app need to implement the following command: **./homework2 check**
App returns the following if connection to DB is successful: **connection established**
App returns the following if connection to DB is successful: **connection failed**
Example:

- **./homework2 check**
- **connection established**

2. (40 points) The client should be able to insert and delete some data into/from tables with the following commands: be careful to functional dependencies, input data is going to be separated by comma "," and no space between the entries.

    ./homework2 add product ID,Name,Description,BrandName

    ./homework2 add productKeyword ID,type_keyword

    ./homework2 delete product ID

    ./homework2 delete productKeyword ID,type_keyword

    ./homework2 add website URL,country,City,ZipCode,Street,E-mail

    ./homework2 delete website URL

    ./homework2 add WebsitePhone URL,phoneNumber

    ./homework2 delete WebsitePhone URL,phoneNumber

    ./homework2 add ExternalSupplier URL,name,phoneNumber,E-mail

    ./homework2 delete ExternalSupplier URL,name

    ./homework2 add sell PID,WURL,Date,InitialPrice,DiscountedPrice

    ./homework2 delete sell PID,WURL

3. (30 points) The client should be able to insert new **bulk** data into tables with the following commands: the operations must be atomic (either commits or abort with all data). Note that each product is separated by comma ",", and different products are separated by newline "\n". The data is going to end with EOF.
   ./homework2 add products

   ID1,Name1,Description1,BrandName1\n

   ID2,Name2,Description2,BrandName2\n

   ID3,Name3,Description3,BrandName3\n

   ID4,Name4,Description4,BrandName4(EOF)

4. (15 points) The client should be able to run queries on the data loaded in RDBMS. Then, for each given requirement, the client should be able to fetch the correct results. The client should be able to implement the following commands for each query:
   ./homework2 query 1

   Results (separated by comma "," for attributes, and by new line "\n" for rows)

   For example,

   ./homework2 query 1

   1,name1,description1,brand1

   Query 1: Find the most popular product in all websites. I.E., the product sold in the highest number of websites. (5 points)

   Query 2: Find the biggest bargain date for each product and website. (5 points)

   Query 3: Find the products which are not listed in any website. (5 points)

Note that the homework is going to be tested via scripts. If your output does not match with the expected output, you will get zero from that part. Thus, please test your program very well to prevent unwanted situations.