CSE 111 – DATABASE SYSTEMS
Final (200 points)

You have to implement the following methods/functions, which operate on the `TPC-H` database, in `Java` or `Python`. We provide you skeleton code for both languages (`Final.java` and `Final.py`). You can choose the language you prefer.

- `T1` finds the number of orders on which two different parts are provided as separate line items by the same supplier. Make sure to count an order only once. As shown in the code, the query result has to be written in file `output/1.out`. **(20 points)**
- `T2` finds the orders on which at least two line items are provided by the same supplier. Group the orders by the nation of the supplier and compute the number of distinct orders per supplier nation. As shown in the code, the query result has to be written in file `output/2.out`. **(20 points)**
- `T3` finds the orders on which `k` line items are provided by the same supplier. `k` is an argument read from the input file `input/3.in`. Group the orders by the nation of the supplier and compute the number of distinct orders per supplier nation. As shown in the code, the query result has to be written in file `output/3.out`. **(40 points)**
- `T4` creates a materialized view `RegionItems(supReg, custReg, itemNo)` that stores the number of line items supplied by suppliers in `supReg` on orders made by customers in `custReg`. `supReg` and `custReg` are the names of the regions as stored in `r_name`. `RegionItems` stores the number of line items for every two regions in the database. The output generated by `T4` consists of all the tuples in `RegionItems`. As shown in the code, the query result has to be written in file `output/4.out`. **(40 points)**
- `T5` deletes the line items supplied by suppliers from nation `nat`, where `nat` is read from the input file `input/5.in`. The content of the materialized view `RegionItems` has to be updated accordingly. The output generated by `T5` consists of all the tuples in the updated `RegionItems`. As shown in the code, the query result has to be written in file `output/5.out`. **(40 points)**
- `T6` updates the nation of all the customers from nation `nat_1` to nation `nat_2`, where `nat_1` and `nat_2` are read from the input file `input/6.in`. The content of the materialized view `RegionItems` has to be updated accordingly. The output generated by `T6` consists of all the tuples in the updated `RegionItems`. As shown in the code, the query result has to be written in file `output/6.out`. **(40 points)**

In order to complete the final exam you have to perform the following tasks:

1. Write the `Java` code that implements the required functionality in the corresponding methods in file `Final.java`. If you use `Python`, you edit the file `Final.py`. This is the only file you have to edit. Moreover, you have to write code only in the methods/functions specified above. If you find it useful, you can create additional methods/functions. However, do not modify the `main` function.
2. You can run your code by executing the command `./test.sh` in the terminal. You have to be in the main folder. In `test.sh`, keep only the commands to execute the code you write. If you use `Java`, delete the line corresponding to `Python` (and the other way around). The output produced by your code is available in `output/x.out`.
3. You have to submit only the `Final.java` or `Final.py` file, whichever you write your code in.
4. You are graded based on the output produced by the code you submit.