Exercise 6.6.1: This and the next exercises involve certain programs that operate on the two relations

```
Product(maker, model, type)
PC(model, speed, ram, hd, price)
```

from our running PC exercise. Sketch the following programs, including SQL statements and work done in a conventional language. Do not forget to issue `BEGIN TRANSACTION`, `COMMIT`, and `ROLLBACK` statements at the proper times and to tell the system your transactions are read-only if they are.

a) Given a speed and amount of RAM (as arguments of the function), look up the PC's with that speed and RAM, printing the model number and price of each.

b) Given a model number, delete the tuple for that model from both `PC` and `Product`.

c) Given a model number, decrease the price of that model PC by $100.

d) Given a maker, model number, processor speed, RAM size, hard-disk size, and price, check that there is no product with that model. If there is such a model, print an error message for the user. If no such model existed in the database, enter the information about that model into the `PC` and `Product` tables.

! **Exercise 6.6.2:** For each of the programs of Exercise 6.6.1, discuss the atomicity problems, if any, that could occur should the system crash in the middle of an execution of the program.

! **Exercise 6.6.3:** Suppose we execute as a transaction T one of the four programs of Exercise 6.6.1, while other transactions that are executions of the same or a different one of the four programs may also be executing at about the same time. What behaviors of transaction T may be observed if all the transactions run with isolation level `READ UNCOMMITTED` that would not be possible if they all ran with isolation level `SERIALIZABLE`? Consider separately the case that T is any of the programs (a) through (d) of Exercise 6.6.1.