Concept: Assertion

- An *assertion* is a predicate expressing a condition that we wish the database always to satisfy.
- An assertion in SQL takes the form

  create assertion <assertion-name> **check** <predicate>
- When an assertion is made, the system tests it for validity, and tests it again on every update that may violate the assertion.
  - This testing may introduce a significant amount of overhead; hence assertions should be used with great care.
- Asserting for all X, P(X) is achieved in a round-about fashion using not exists X such that not P(X)

Examples:

1. The sum of all loan amounts for each branch must be less than the sum of all account balances at the branch.

```
create assertion sum-constraint check
(not exists (select * from branch
                where (select sum(amount) from loan
                        where loan.branch-name =
                    branch.branch-name)
                >= (select sum(amount) from account
                        where loan.branch-name =
                    branch.branch-name)))
```

2. Every loan has at least one borrower who maintains an account with a minimum balance or $1000.00

```
create assertion balance-constraint check
(not exists (
   select * from loan
          where not exists (
      select *
                from borrower, depositor, account
                where loan.loan-number = borrower.loan-number
                        and borrower.customer-name = depositor.customer-name
                        and depositor.account-number = account.account-number
                        and account.balance >= 1000)))
```