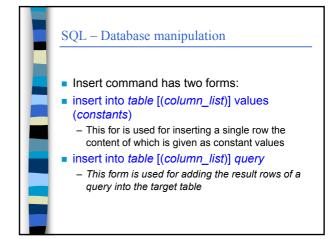
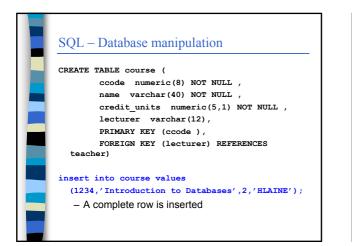
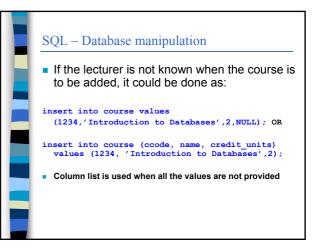
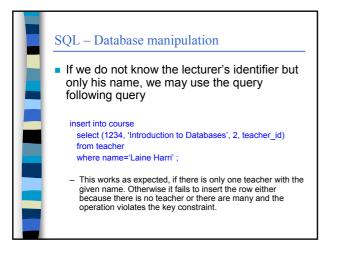


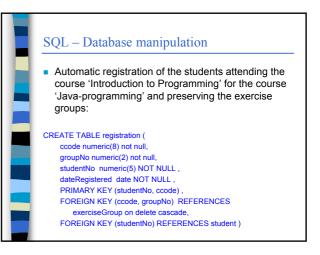
- SQL provides operations for changing the data in the database:
- insert for adding new rows
- delete for removing existing rows
- update for changing existing rows











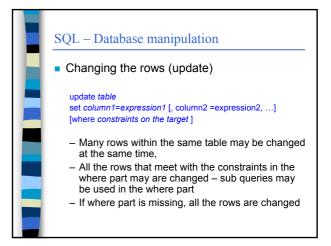
SQL - Database manipulation

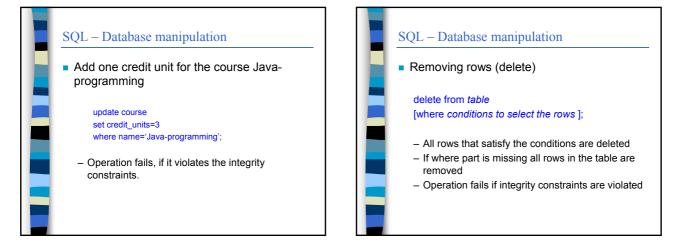
In Oracle SQL:

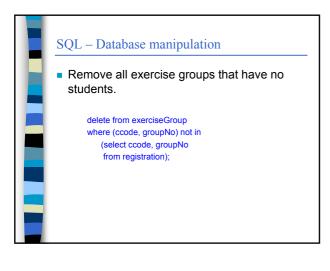
Insert into registration

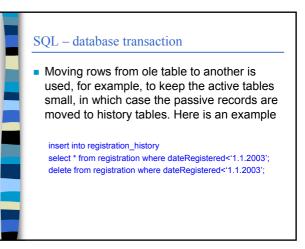
select java.ccode, groupNo, studentNo, sysdate from course java, course intro, registration where java.name='Java-programming' and intro.name='Introduction to Programming' and intro.ccode=registration.ccode;

java course is not connected, but there is only one record that satisfies the selection condition









SQL - database transaction

 A collection of operations that must all be executed as a single unit is called a database transaction. A transaction must be done as a whole not only partially. Money transfer for example consists of two operations:

> update account set balance=balance-500 where accountNo=123456; update account set balance=balance+500 where accountNo=654321;

SQL - database transaction

DBMS guarantees

- Transactions are not carried out only partially
- Outsiders cannot see the intermediate results (for example that money is taken from one account but not yet added to the other)
- Changes made on the database may be cancelled up to the if the transaction has not been committed
- When the transaction is committed the changes become permanent and visible also to the outsiders.

