# Update Operations on Relations

## **Operations**

- Types of relational DMLs:
  - relational algebra (ISBL)
  - tuple calculus (SQL)
  - domain calculus (QBE)
- a relational DML with the same "retrieval power" as the relational algebra is said to be relationally complete
- all relational DMLs have syntax for:
  - change (insert, delete, update)
  - queries (retrieval)

## **Update Operationa**

INSERT a tuple.

DELETE a tuple.

MODIFY a tuple.

- Integrity constraints should not be violated by the update operations.
- Several update operations may have to be grouped together
- Updates may propagate to cause other updates automatically. This may be necessary to maintain integrity constraints

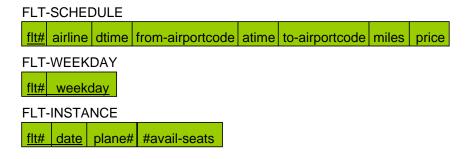
- In case of integrity violation, several actions can be taken:
  - cancel the operation that causes the violation (REJECT optiom)
  - perform the operation but inform the user of the violation
  - trigger additional updates so the violation is corrected (CASCADE option, SET NULL option)
  - execute a user-specified error-correction routine

flt# airline dtime from-airportcode atime to-airportcode miles price

• constructs for insertion are very primitive:

**INSERT INTO** FLT-SCHEDULE **VALUES** ("DL212", "DELTA", 11-15-00, "ATL", 13-05-00, "CHI", 650, 00351.00);

INSERT INTO FLT-SCHEDULE
VALUES(FLT#:"DL212",AIRLINE:"DELTA");



• "insert into FLT-INSTANCE all flights scheduled for Thursday, 9/10/98"

INSERT INTO FLT-INSTANCE(flt#, date)
(SELECT S.flt#, 1998-09-10
FROM FLT-SCHEDULE S, FLT-WEEKDAY D
WHERE S.flt#=D.flt# AND weekday="TH");

#### **FLT-WEEKDAY**



- constructs for deletion:
- "delete flights scheduled for Thursdays"

**DELETE FROM** FLT-WEEKDAY **WHERE** weekday="TH";

### **FLT-WEEKDAY**



- constructs for update:
- "update flights scheduled for Thursdays to Fridays"

UPDATE FLT-WEEKDAY
SET weekday="FR"
WHERE weekday="TH";