

Relational Database Modifications in SQL

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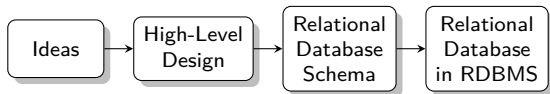
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Outline

- 1 Introduction to SQL
- 2 Inserting Tuples
- 3 Deleting Tuples in Relations
- 4 Updating Tuples in Relations
- 5 Assignment

Overview



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Introduction to SQL

SQL (pronounced as “sequel”) is the principal language used to describe and manipulate relational database, and has several aspects:

- ▶ Data definition language (DDL).
 - ▶ SQL includes commands to create database objects such as tables, indexes, and views, as well as commands to define access rights to those database objects.
 - ▶ Topics of this lecture: SQL commands to create database tables (relations)
- ▶ Data manipulation language (DML).
 - ▶ SQL includes commands to insert, update, delete, and retrieve data within the database tables.
- ▶ Transaction control language (TCL).
 - ▶ The DML commands in SQL are executed within the context of a transaction.
- ▶ Data control language (DCL).
 - ▶ Data control commands are used to control access to data objects.

To Discuss Subset of DML

- ▶ Insert tuples into a relation.
- ▶ Delete certain tuples from a relation.
- ▶ Update values of certain components of certain existing tuples.

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Adding Tuples to Relations

To add or insert tuples to relations, use

```
INSERT INTO R( $r_1, r_2, \dots, R_n$ ) VALUES( $v_1, v_2, \dots, v_n$ )
```


Adding Tuples to Relations: Example 1

```
INSERT INTO Students
  (name, phone, address, birthdate, gender)
VALUES (
  'John_Doe',
  '1112223333',
  '1_BC_Street, Brooklyn, NY',
  '2001-03-08',
  'M');
```

Adding Tuples to Relations: Example 2

```
INSERT INTO Students
VALUES (
    'Jane□Doe',
    '1112223333',
    '1□BC□Street,□Brooklyn,□NY',
    '2001-03-08',
    'M');
```

Adding Tuples to Relations: Example 3

```
INSERT INTO Students  
  (name, phone)  
VALUES (  
  'Amy□Doe',  
  '1112223333');
```

Constraints in Action ...

Try this again,

```
MariaDB [db]> INSERT INTO Students
  (name, phone)
  VALUES ('Amy□Doe', '1112223333');
ERROR 1062 (23000): Duplicate entry
'Amy□Doe-1112223333' for key 'PRIMARY'
MariaDB [db]>
```

Constraints in Action ...

Try this again,

```
MariaDB [db]> INSERT INTO Enrollment
  (sname, sphone, cidnum)
VALUES
  ('Amy_Smith', '2222333112', '11112');
ERROR 1452 (23000): Cannot add or update a child row:
a foreign key constraint fails ('db`.`Enrollment`,
CONSTRAINT 'Enrollment_ibfk_1' FOREIGN KEY
  ('sname', 'sphone')
  REFERENCES 'Students' ('name', 'phone'))
MariaDB [db]>
```

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Deleting Tuples in Relations

To delete tuples in relations, use `DELETE FROM R WHERE <condition>;`

Deleting Tuples in Relations: Example

```
DELETE FROM Students  
WHERE name='Amy□Doe' AND phone='1112223333';
```


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Updating Tuples in Relations

To update tuples in relations, use `UPDATE R SET <new-value assignments> WHERE <condition>;`

Updating Tuples in Relations: Example

```
UPDATE Students  
SET phone='2221113333'  
WHERE name='Jane□Doe' AND phone='1112223333';
```

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Assignment

Let's work on an assignment using paper and pencil/pen ...