Data Management

Adding, Changing, Removing, and Retrieving Data

Usage

The standardized parts

- Adding records - INSERT
- Modifying data - UPDATE
- Deleting records - DELETE
- Searching for records - SELECT

Danger!

Be careful with these

SQL offers great power

Don’t forget to be responsible!!!

INSERT

Adding data to the database

- Comma delimited list of fields that will receive data
- Comma delimited list of values to use
- Values list corresponds to fields list
- Basic Syntax:

INSERT INTO <table> (<field list>) VALUES (<value list>)

UPDATE

Modifying data in the database

- Statement modifies the values of one or more fields in one or more records
  - WARNING: There is NO confirmation message
  - Basic Syntax:

UPDATE <table> SET <field>=<value> WHERE <condition>

DELETE

Removing records from the database

- Instead of finding records, it deletes them
- WARNING: There is NO confirmation message
- Basic Syntax:

DELETE FROM <table> WHERE <condition>

SELECT

Finding records in the database

Basic syntax:

SELECT <field list> FROM <table name>;

- Field list is a comma separate list of fields that exist in the table
- An asterisk in the field list is a shortcut for listing data from all fields
- Semi-colon at the end finishes the statement

SELECT

Finding records in the database

Basic syntax:

SELECT <field list> FROM <table name>;

SELECT name, employees, sales, state FROM companies;

SELECT * FROM companies;

Big databases return lots of data

SELECT

Finding records in the database

Limiting your searches:

WHERE designates which records to return

- Syntax: WHERE <field name> <operator> <value>
- Basic Operators: = > < != <>
- Examples:

  SELECT * FROM companies WHERE employees > 500;

  SELECT * FROM companies WHERE name = 'IBM';

SELECT

Finding records in the database

Limiting your searches:

Multiple WHERE conditions

- Use AND to impose additional limits
- Use OR to combine results
- When using both, use parenthesis to designate order of operation

SELECT

Finding records in the database

Limiting your searches:

Multiple WHERE conditions

```
SELECT * FROM companies WHERE employees > 500 AND sales > 100000;

SELECT * FROM companies WHERE state='OR' OR state='WA' OR state='ID';

SELECT * FROM companies WHERE (state='OR' OR state='WA') AND sales > 100000;
```

SELECT

Finding records in the database

A note about nothing:

- Fields indicate the kind of data to be stored
- If no value is specified for the field, then nothing is stored (literally)
- NULL represents no value
  - NULL is not equal to zero (0)
  - NULL is not equal to empty string (‘ ’)

SELECT

Finding records in the database

A note about nothing:

- How to find records with nothing as data?

NULL does not equal “ ”

- Can’t use standard = or != operators
- Use IS NULL or IS NOT NULL

```
SELECT company_id, name FROM companies WHERE salesperson IS NULL;

SELECT * FROM companies WHERE contact IS NOT NULL;
```

SELECT

Finding records in the database

Finding records in a range:

- Option 1 - field >= min AND field <= max
- Option 2 - field BETWEEN min AND max

```
SELECT * FROM companies WHERE employees BETWEEN 500 AND 1000;
```

SELECT

Finding records in the database

Finding records that are ‘close enough’:

- Use wild card symbols in value = %
- Use LIKE keyword to designate flexible search

```
SELECT * FROM companies WHERE name LIKE ‘A%’;     ⇐ start with ‘A’
SELECT * FROM companies WHERE name LIKE ‘% Inc.’;     ⇐ ends with ‘Inc.’
SELECT * FROM companies WHERE name LIKE ‘%er%’;     ⇐ contains with ‘er’
```

Example