### More DML

Database Concepts

INSERT/UPDATE/DELETE/CREATE

### DDL

In this lecture, you will learn how to write SQL statements to:

- -Change data in a database table
- -Remove data from a database table
- -Add data into a database table

Use the StaffBranch database on the earlier handout for this session.

Database Concepts

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# SQL UPDATE command

This statement is used to update one or more fields (values) in the row(s) of a table.

Syntax:

**UPDATE** <tablename>

**SET** col1=val1 [,col2=val2,...,coln=valn]

[**WHERE** <condition> = True];

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### Example:

Set the salary field for *all* staff in the table *Staff* to  $\in$ 53,000.

**UPDATE Staff** 

SET Salary = 53,000;

**All** rows in the table are updated.

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### Example:

Set the salary field for staff number 3 to €53,000.

UPDATE Staff SET Salary = 53,000 WHERE StaffNo = 3;

Only one row in the table is updated.

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Update the salary of all staff by 5%.

UPDATE Staff
SET Salary = Salary \* 1.05;

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Change the name details for staff number 4 to John kennedy (from Joan Kenny)

UPDATE Staff
SET Surname = 'KENNEDY', Forename = 'JOHN'
WHERE StaffNo = 4;

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## **SQL DELETE Command**

This statement is used to delete/remove one or more rows from a table;

## **Syntax:**

**DELETE** 

FROM <tablename>

[WHERE <condition> = True];

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Delete staff number 2 from the Staff table

DELETE FROM Staff WHERE StaffNo = 2;

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Delete all properties with a monthly rent of less than €250.

**DELETE** 

**FROM Properties** 

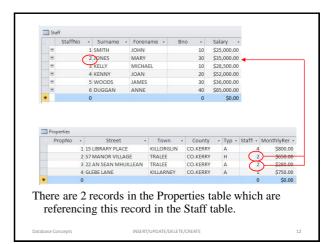
WHERE MonthlyRent < 250;

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- You must be careful when deleting records from a table.
- The record may have related records in another table.
- If this is the case, the rules of *Referential Integrity* will be violated if you delete the record.
- What happens if we try delete StaffNo 2??

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- Delete staff number 2 from the staff table.
- There are related records in the properties table.

There are properties which are overseen by staff number 2.

• Deletion is not allowed due to *referential integrity* constraints. The DBMS detects this.

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Consider the following DELETE Query:

DELETE \*

FROM Staff;

What is the outcome here?

Be careful!

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INSERT/UPDATE/DELETE/CREATE

## **SQL INSERT Command**

This statement is used to insert a *single* row into a *single* database table.

There are *two* formats of the INSERT syntax.

Database Concepts

INSERT/UPDATE/DELETE/CREATE

## Syntax (1):

Insert a value for every column in the table

INSERT INTO <tablename> VALUES (val1, val2,...,valn);

e.g

INSERT INTO Branch

 $\pmb{VALUES}\ (50, `The\ Square', `Listowel', `Co.Kerry', `0683456734');\\$ 

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### Syntax (2):

Insert a value for only *some* of the columns in the table

INSERT INTO <tablename> [(Col1, Col2,...Coln)] VALUES (val1, val2,...,valn);

e.g.

INSERT INTO Staff (StaffNo, Surname, Forename, Bno) VALUES (7,'Smith', 'James', 30);

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## DDL

SQL also allows the creation of a database table. The syntax for the CREATE TABLE command is as follows:

CREATE TABLE <tablename>
(<name Col1> datatype(size),
 <name Col2> datatype(size),
:
 :
 <name Coln> datatype(size));

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# **Example (Oracle Notation)**

#### **CREATE TABLE Branch**

(Bno numeric(2),

Street char(20),

Town char(20),

County char(15),

TelNo char(15));

This creates a table WITHOUT a primary key

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Every table must have a primary key (PK). A PK constraint can be applied at *record level*.

### **CREATE TABLE Branch**

(Bno numeric(2) PRIMARY KEY,

Street char(20),

Town char(20),

County char(15),

TelNo char(15));

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If a table requires a composite primary key, the following is <u>NOT</u> possible:

### **CREATE TABLE Purchase\_Items**

(P\_ID numeric(5) PRIMARY KEY,

Stock\_No numeric(3) PRIMARY KEY,

Qty\_Sold numeric(3),

Unit\_Price numeric(6,2));

Instead, apply the constraint at table level

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Good practice to define all PK constraints at table level:

#### **CREATE TABLE Branch**

(Bno numeric(2),

Street char(20),

Town char(20),

County char(15),

TelNo char(15),

CONSTRAINT pk\_Branch PRIMARY KEY (Bno));

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### Example of a composite PK:

### **CREATE TABLE Purchase\_Items**

(P\_ID numeric(5),

Stock\_No numeric(3),

Qty\_Sold numeric(3),

Unit\_Price numeric(6,2));

 ${\bf CONSTRAINT\ pk\_Purch\_Items\ PRIMARY\ KEY\ (P\_ID,\ Stock\_No));}$ 

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## Defining a Foreign Key is straight forward:

#### **CREATE TABLE Staff**

(StaffNo Numeric(3),

Surname char(20),

Forename char(20),

**Bno** Numeric(2),

Salary Decimal(7,2),

CONSTRAINT pk\_Branch PRIMARY KEY (StaffNo),

CONSTRAINT fk\_Staff\_Branch FOREIGN KEY (Bno)

**REFERENCES Branch)**;

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- Constraint names are objects in the database
- Details of these objects are also contained in the data dictionary
- Constraint names, like table/query names, must be unique - Can not have two constraints with the same name

Database Concept

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# Removing a Database Table

Sometimes you may need to remove or delete a table from the database.

# Syntax:

DROP TABLE <tablename>;

DROP TABLE Branch:

The rules of referential integrity apply!

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