More DML

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.

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];

Example:

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

```
UPDATE Staff
SET Salary = 53,000;
```

All rows in the table are updated.

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.

Update the salary of all staff by 5%.

```
UPDATE Staff
SET Salary = Salary * 1.05;
```

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

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


SQL DELETE Command

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

Syntax:

```
DELETE
FROM <tablename>
[WHERE <condition> = True];
```


Delete staff number 2 from the Staff table

```
DELETE
FROM Staff
WHERE StaffNo = 2;
```


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

```
DELETE
FROM Properties
WHERE MonthlyRent < 250;
```


- 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??

Staff

StaffNo	Surname	Forename	Bno	Salary
1	SMITH	JOHN	10	$25,000.00
2	JONES	MARY	30	$35,000.00
3	KELLY	MICHAEL	10	$28,500.00
4	KENNY	JOAN	20	$52,000.00
5	WOODS	JAMES	30	$36,000.00
6	DUGGAN	ANNE	40	$85,000.00
0			0	$0.00

Properties

PropNo	Street	Town	County	Typ	Staffi	MonthlyRer
1	15 LIBRARY PLACE	KILLORGLIN	CO.KERRY	A	4	$800.00
2	57 MANOR VILLAGE	TRALEE	CO.KERRY	H	2	$650.00
3	22 AN SEAN MHUILLEAN	TRALEE	CO.KERRY	A	2	$280.00
4	GLEBE LANE	KILLARNEY	CO.KERRY	A	1	$750.00
0					0	$0.00

There are 2 records in the Properties table which are referencing this record in the Staff table.

- 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.

Consider the following DELETE Query:

```
DELETE *
FROM Staff;
```

What is the outcome here?
Be careful!

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.

Syntax (1):

Insert a value for ***every*** column in the table

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

e.g.

```
INSERT INTO Branch
VALUES (50, 'The Square', 'Listowel', 'Co.Kerry', '0683456734');
```


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);
```


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));
```

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

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));
```


If a table requires a composite primary key, the following is NOT 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***

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));
```


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));
 CONSTRAINT pk_Purch_Items PRIMARY KEY (P_ID, Stock_No));
```


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);
```

- 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

Removing a Database Table

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

Syntax:

DROP TABLE <tablename>;

e.g.

DROP TABLE Branch:

The rules of referential integrity apply!