

Relational Databases

Retrieving data from the database



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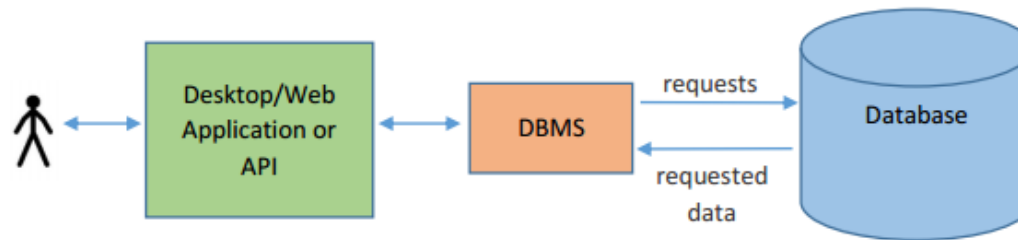
Lesson Content

- **Learning Outcome:** Create basic queries to manage data held in a Relational Database Management System

- **Agenda**
 1. Data Retrieval
 2. Use of SELECT statement
 3. Syntax of SELECT
 4. Selecting specific columns
 5. Renaming columns
 6. Using expressions
 7. NULL values
 8. String concatenation
 9. DISTINCT keyword

Data Retrieval

- In a Relational DBMS the user will communicate with the database through an application



- Data Retrieval:
 - The process by which users manage to retrieve data from a database.
 - This involves the use of SQL (Structured Query Language) in the form of SELECT statements

Use of SELECT statement

- SELECT can be used to perform the following operations
 - *Projection*: choosing particular columns to be included in the result

Pid	Product Name	Product Price	SupplierId
1	Orange	0.50	10
2	Apple	0.40	10
3	Banana	0.60	20

- *Selection*: choosing particular rows of data to be included in the result

Pid	Product Name	Product Price	SupplierId
1	Orange	0.50	10
2	Apple	0.40	10
3	Banana	0.60	20

- *Joining*: obtaining data from multiple entities

Pid	Product Name	Product Price	SupplierId(FK)
1	Orange	0.50	10
2	Apple	0.40	10
3	Banana	0.60	20

Sid	Supplier Name
10	MFP Limited
20	ABC imports

Syntax of SELECT

```
SELECT * | {[DISTINCT] column | expression [alias], . . . }  
FROM table
```

Selecting specific columns

- In order to be able to specify which columns in a table are to be included in a query result you need to specify them after the SELECT statement.
- NOTE: the order in which the columns are specified is important

```
SELECT country_name, country_id  
FROM countries;
```

```
SELECT country_id, country_name  
FROM countries;
```

Renaming columns

- This is when the column headings of the query result differs from the column names used in the entity itself.
- To rename columns there are 3 different ways
 - **Using AS keyword:** include the AS keyword soon after the actual column name has been declared. This should be followed by the new name
 - **Using single quotes:** include the new name soon after the actual column name. The new name should be enclosed in single quotes
 - **Using single word:** include the new name soon after the column name has been declared. The new name cannot have any blank spaces (therefore cannot be made up of two or more words)

Using expressions

- This is when the output of a SELECT statement includes a modified version of what is available in the database
- Most of the time expressions include mathematical operations as the one's listed below

Operator	Description
+	Add
-	Subtract
*	Multiply
/	Divide

- The above operators can be used with numeric and date columns
- The order in which the operators are placed effects the result.

NULL values

- NULL values are values which are unavailable, unassigned or unknown
- A NULL value **is not** equal to 0 or a blank space
- A column cannot be assigned a NULL value, if and only if it has a PRIMARY KEY or a NOT NULL constraint assigned to it.

String concatenation

- String concatenation is when two or more strings are put together such that the resulting string can be placed in one single column.
- The symbol that is associated with string concatenation is the plus sign (+)
- Concatenation can be used with string values or values which have been converted to string.
- String literals can be additionally included to existing strings

DISTINCT keyword

- This is used in the case that no duplicate values are wanted in the query output.
- You can have only one DISTINCT keyword per SELECT statement
- If the DISTINCT keyword is followed by more than one column, the result will include every distinct combination of the columns following the keyword

Any questions?