

# CREATING A DATABASE IN MICROSOFT ACCESS. TABLES AND QUERIES

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# **Creating a blank database in Access 2007/2013:**

File / New / Featuring category / Blank Database.

The implicit format of the database file is:

\*.accdb (Access 2007/2013) or \*.mdb (Access 2003)

## **The objects of an Access database**

Tables

Queries

Reports, Forms

Macro-commands

Pages of data access

# Tables

There are two ways of creating a table:

- Design view
- Datasheet view

A table contains

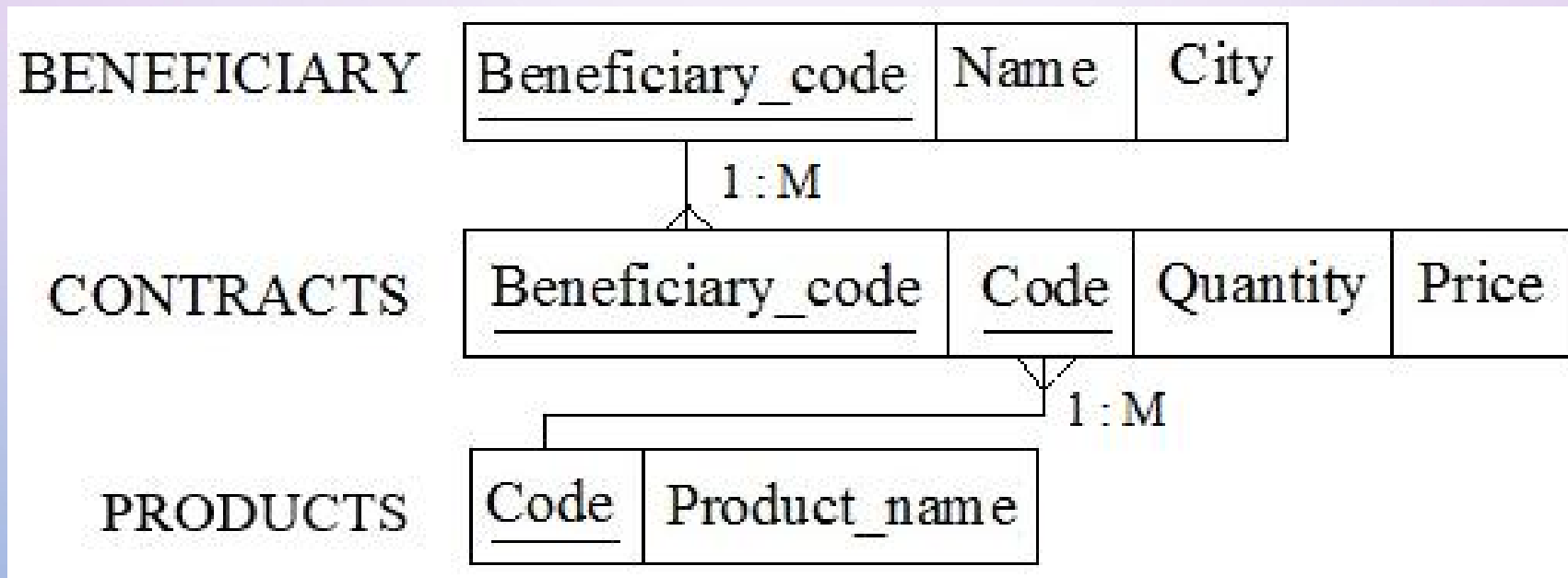
- lines (records), columns (fields)
- the head of the table (the structure of the table)

Access data types:

Text, Memo, Number, Date/Time, Currency, Yes/No, OLE Object, Hyperlink.

### Example:

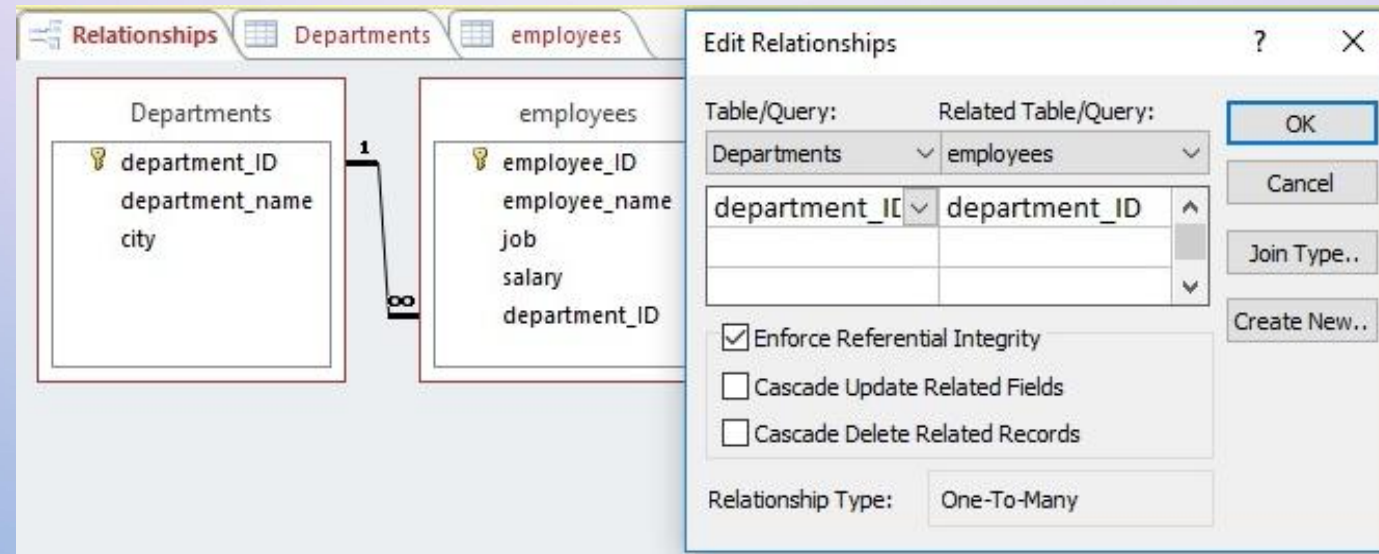
Be it a database Deposit which contains the tables: BENEFICIARY, CONTRACTS, PRODUCTS.



# Referential integrity in the database

Editing the relationships between tables in Microsoft Access:  
Tool menu/ Relationships, the Editing relationships / Enforce Referential Integrity

Example: Be it the database Firm.

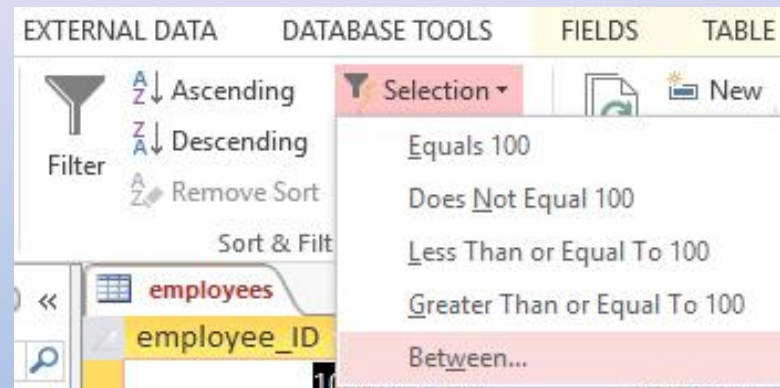




## Operations with table records:

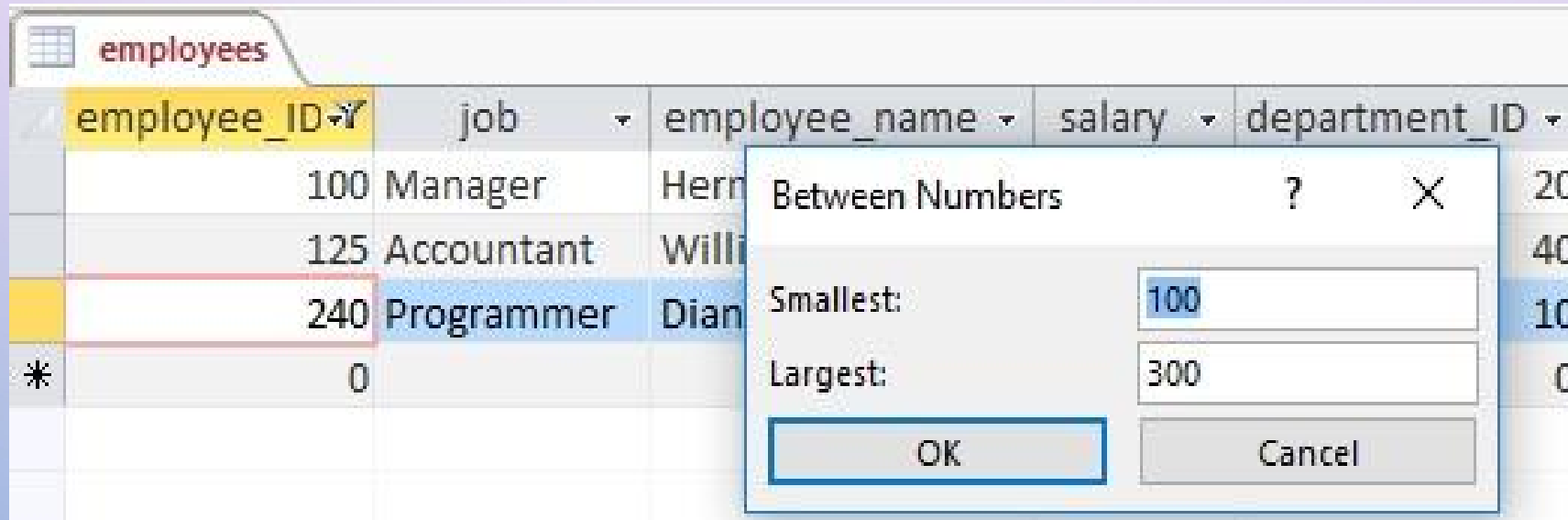
- adding a new line to a table (Data Entry option)
- modifying a line in a table (DataSheet mode)
- deleting a line in a table
- sorting the data in a table (Sort option)
- filtering the data in a table: Filter option: Selection, Advanced (Filter by form, Apply Filter/Sort etc) (Microsoft Access, 2010).

### Filter by Form



## Filter by selection

Example: displaying the employees with the employee\_ID between 100 and 300



The screenshot shows the 'employees' table in a database application. The table has columns: employee\_ID, job, employee\_name, salary, and department\_ID. A dialog box titled 'Between Numbers' is open, allowing the user to filter the data by employee\_ID. The dialog has input fields for 'Smallest' (set to 100) and 'Largest' (set to 300), with 'OK' and 'Cancel' buttons.

employee_ID	job	employee_name	salary	department_ID
100	Manager	Herrn	20	20
125	Accountant	Willi	40	40
240	Programmer	Dian	10	10
*	0		0	0

## Advanced Filter tool

Example: Display the employees from department 30. Sort upwardly according to the salary

The screenshot shows the 'Adv\_Filter' tool interface. The 'employees' table is selected, and the following fields are listed: employee\_ID, employee\_name, job, salary, and department\_ID. Below the table, the filter criteria are defined:

Field:	employee_name	salary	department_ID
Table:	employees	employees	employees
Sort:		Ascending	
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:			30

The screenshot shows the 'Adv\_Filter' tool interface displaying the filtered results of the 'employees' table. The results are sorted by salary in ascending order and filtered by department\_ID 30.

employee_name	salary	department_ID	employee_ID	job
Michael	2800	30	380	Sales agent
John	3000	30	904	Seler
*	0	0	0	



## Types of queries

A query is an SQL instruction which extracts the data from tables.

Types of queries in Microsoft Access (Create/ Other, Query Design):

1. select query or crosstab query
2. action query
3. queries with parameters
4. queries specific to SQL

# 1. Select and crosstab queries

Query2 Departments

Fields:

- department\_ID
- department\_name
- city

Design Grid:

Field	Table	Sort	Show	Criteria	or
department_name	Departments		<input checked="" type="checkbox"/>		
city	Departments		<input checked="" type="checkbox"/>	"Bremen"	

Query Results:

department_name	city
Marketing	Bremen
Accounting	Bremen

The SQL view option:  
SELECT D.department\_name,  
D.city  
FROM departments D  
WHERE D.city ="Bremen";

# Using groups of lines and grouping functions (aggregate functions)

Example: Calculate the average salary of the employees from each department

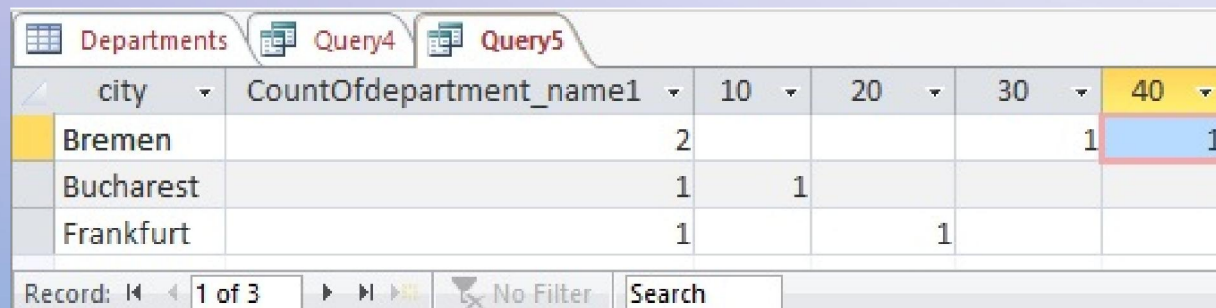
SELECT department\_ID,  
avg(salary) as AverageSalary  
FROM employees  
group by department\_ID;

department_ID	AverageSalary
10	4033.33333333333
20	7400
30	2900
40	4765

## Crosstab type queries

The queries of the cross table type are used to extract data of grouped form using pivot columns

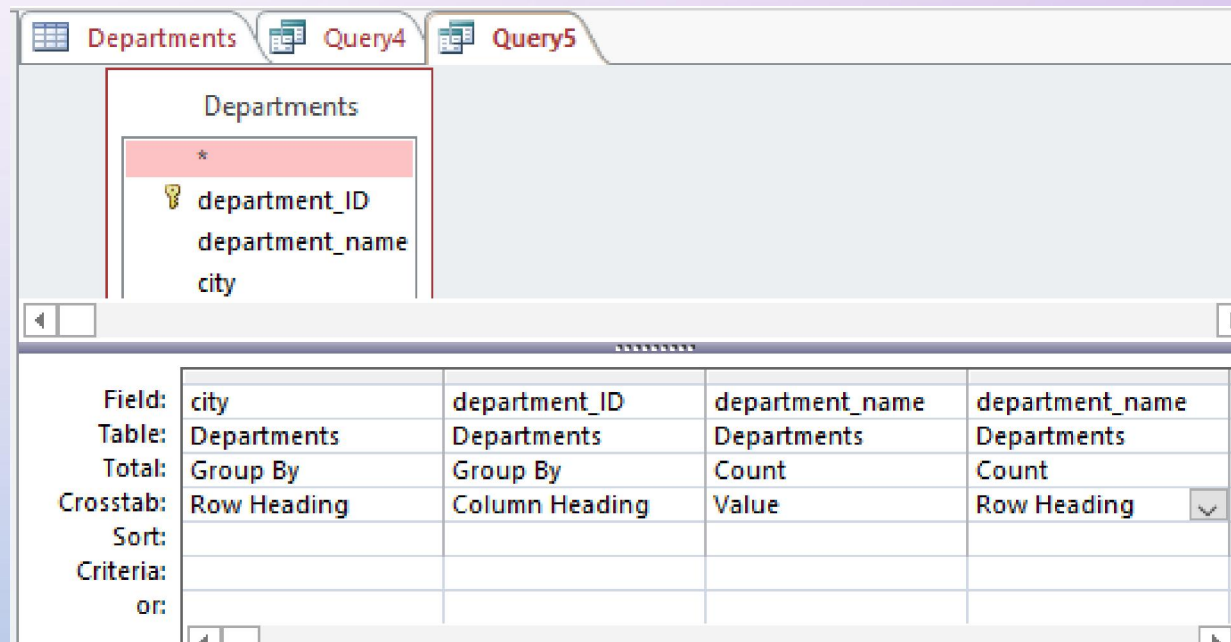
Example: Display the number of departments from each city, using a pivot column (the department).



The screenshot shows a Microsoft Access window with three tabs: Departments, Query4, and Query5. The Query5 tab is active, displaying a Crosstab query result. The query is titled 'CountOfdepartment\_name1'. The columns are 'city', 'CountOfdepartment\_name1', and four pivot columns labeled '10', '20', '30', and '40'. The rows are 'Bremen', 'Bucharest', and 'Frankfurt'. The data shows the count of departments for each city across the four pivot columns. The cell for Bremen in the '40' column is highlighted with a red border and a blue background, showing a value of 1.

city	CountOfdepartment_name1	10	20	30	40
Bremen	2			1	1
Bucharest	1	1			
Frankfurt	1		1		

Record: 1 of 3 | No Filter | Search



The screenshot shows the design view of a Crosstab query in Microsoft Access. The query is titled 'CountOfdepartment\_name1'. The fields are 'city', 'department\_ID', 'department\_name', and 'department\_name'. The table is 'Departments'. The total is 'Group By'. The crosstab is 'Row Heading'. The sort is 'Column Heading'. The criteria are 'Value' and 'Row Heading'.

Field:	city	department_ID	department_name	department_name
Table:	Departments	Departments	Departments	Departments
Total:	Group By	Group By	Count	Count
Crosstab:	Row Heading	Column Heading	Value	Row Heading
Sort:				
Criteria:				
or:				



SQL view:

```
TRANSFORM Count(Departments.department_name) AS  
CountOfdepartment_name  
SELECT Departments.city, Count(Departments.department_name) AS  
CountOfdepartment_name1 FROM Departments  
GROUP BY Departments.city  
PIVOT Departments.department_ID;
```

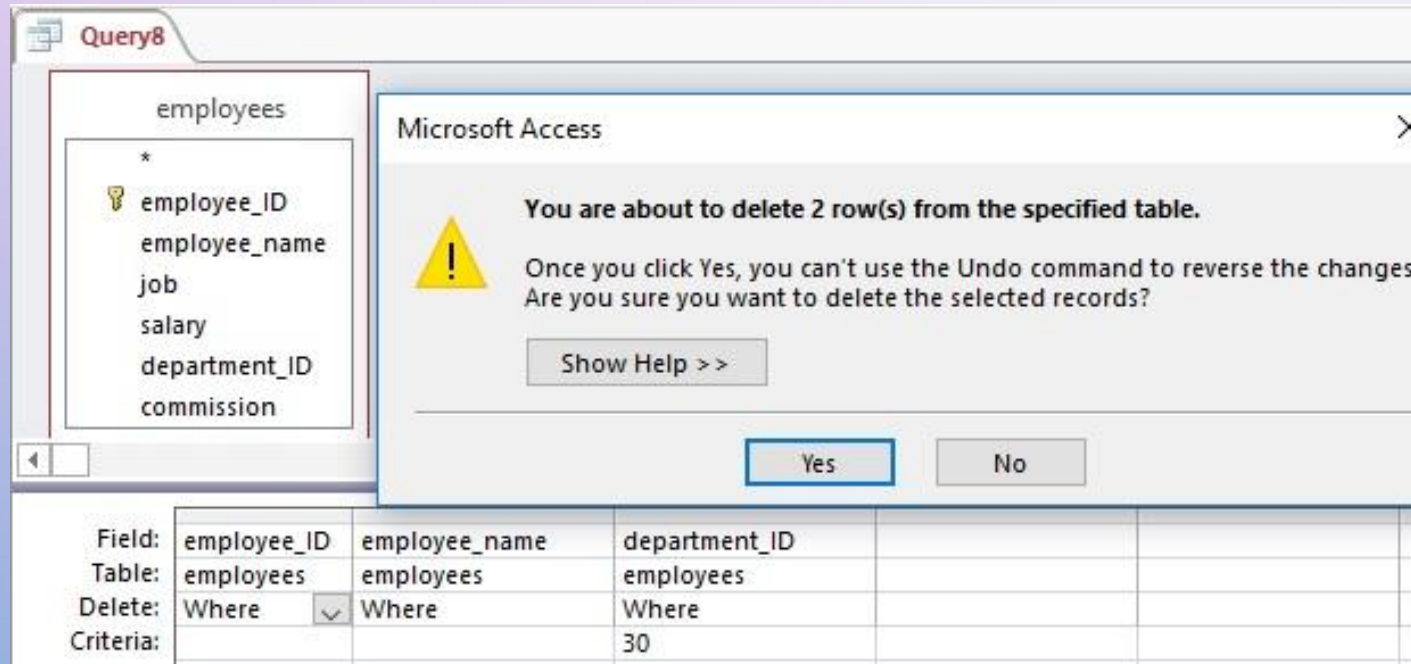
## 2. Action queries

- Append type queries
- Deleting queries
- Update
- Make table

These modifications cannot be cancelled with the CTRL+Z key combination.

## Query type: Delete

Example: Display the information on the employees, after deleting the employees from department 20



SQL view:

```
DELETE employee_ID,  
employee_name,  
department_ID  
FROM employees  
WHERE department_ID = 30;
```

### 3. Queries with parameter

- requires a value when it is run

Query11

Departments

- \* department\_ID
- department\_name
- city

Query Parameters

Parameter	Data Type
x	Integer

OK

SQL view:

PARAMETERS x Short;

SELECT employee\_name, employees.department\_ID  
FROM employees WHERE department\_ID =[x];

Query12

employees

- \* employee\_ID
- employee\_name
- job
- salary

Enter Parameter Value

x

10

OK Cancel

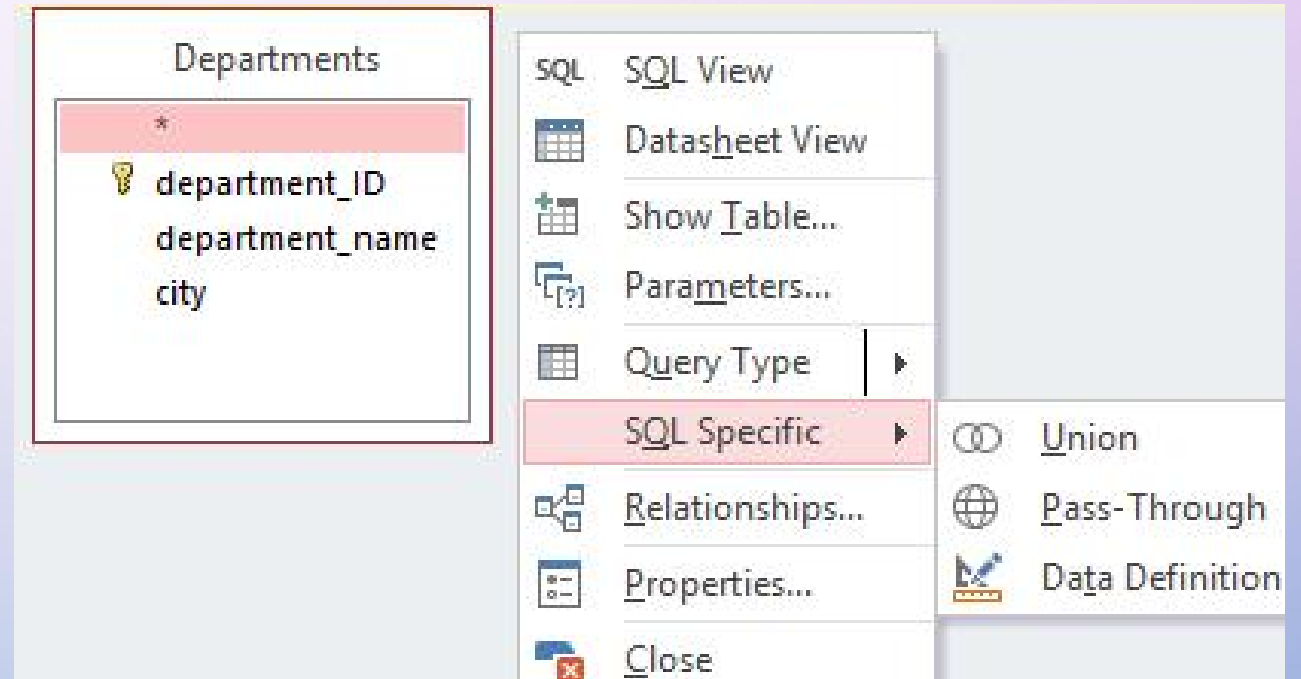
Field:	employee_name	job	department_ID	
Table:	employees	employees	employees	
Sort:				
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Criteria:			[x]	



## 4. SQL Queries

The specific SQL interrogations cannot be opened in Design view.

They can be opened only in SQL view or can be run.



## **Bibliography**

**Microsoft Access** Documentation, 2010

**Microsoft Access** Help, 2007

**Microsoft Access** Help, 2013

**Tudor, N. L.**, Information Systems and Oracle Database Management,  
Matrix Rom Publishing House Bucharest, 2011