**Homework: Advanced SQL**

This document defines the homework assignments from the ["Databases" Course @ Software University](https://softuni.bg/trainings/20/Databases-Feb-2015). Please submit as homework a single **zip** / **rar** / **7z** archive holding the solutions (source code) of all below described problems.

1.) **Write a SQL query to find the names and salaries of the employees that take the minimal salary in the company.**

Use a nested SELECT statement.

|  |  |  |
| --- | --- | --- |
| **FirstName** | **LastName** | **Salary** |
| Susan | Eaton | 9000.00 |
| Kim | Ralls | 9000.00 |
| Jimmy | Bischoff | 9000.00 |

You should submit a SQL file as a part of your homework.

2.) **Write a SQL query to find the names and salaries of the employees that have a salary that is up to 10% higher than the minimal salary for the company.**

|  |  |  |
| --- | --- | --- |
| **FirstName** | **LastName** | **Salary** |
| Rostislav | Shabalin | 9500.00 |
| Russell | King | 9500.00 |
| Jimmy | Bischoff | 9000.00 |
| Michael | Vanderhyde | 9300.00 |
| John | Frum | 9300.00 |
| Merav | Netz | 9100.00 |
| Jan | Miksovsky | 9100.00 |
| … | … | … |

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3.) **Write a SQL query to find the full name, salary and department of the employees that take the minimal salary in their department.**

Use a nested SELECT statement.

|  |  |  |
| --- | --- | --- |
| **FullName** | **Salary** | **Department** |
| Gail Erickson | 32700.00 | Engineering |
| Jossef Goldberg | 32700.00 | Engineering |
| Sharon Salavaria | 32700.00 | Engineering |
| Gancho D'Hers | 25000.00 | Tool Design |
| … | … | … |

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4.) **Write a SQL query to find the average salary in the department #1.**

|  |
| --- |
| **Average Salary** |
| 40166.6666 |

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5.) **Write a SQL query to find the average salary in the "Sales" department.**

|  |
| --- |
| **Average Salary for Sales Department** |
| 29988.8888 |

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6.) **Write a SQL query to find the number of employees in the "Sales" department.**

|  |
| --- |
| **Sales Employees Count** |
| 18 |

You should submit a SQL file as a part of your homework.

7.) **Write a SQL query to find the number of all employees that have manager.**

|  |
| --- |
| **Employees with manager** |
| 289 |

You should submit a SQL file as a part of your homework.

8.) **Write a SQL query to find the number of all employees that have no manager.**

|  |
| --- |
| **Employees without manager** |
| 4 |

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9.) **Write a SQL query to find all departments and the average salary for each of them.**

|  |  |
| --- | --- |
| **Department** | **Average Salary** |
| Document Control | 14400.00 |
| Engineering | 40166.6666 |
| Executive | 92800.00 |
| Facilities and Maintenance | 13057.1428 |
| … | … |

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10.) **Write a SQL query to find the count of all employees in each department and for each town.**

|  |  |  |
| --- | --- | --- |
| **Town** | **Department** | **Employees count** |
| Index | Document Control | 1 |
| Issaquah | Document Control | 4 |
| Bellevue | Engineering | 1 |
| Redmond | Engineering | 1 |
| … | … | … |

Order by department name.

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11.) **Write a SQL query to find all managers that have exactly 5 employees.**

Display their first name and last name.

|  |  |  |
| --- | --- | --- |
| **FirstName** | **LastName** | **Employees count** |
| Pilar | Ackerman | 5 |
| Paula | Barreto de Mattos | 5 |
| Jeff | Hay | 5 |
| Lori | Kane | 5 |
| … | … | … |

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12.) **Write a SQL query to find all employees along with their managers.**

For employees that do not have manager display the value "(no manager)".

|  |  |
| --- | --- |
| Employee | **Manager** |
| Martin Kulov | (no manager) |
| George Denchev | (no manager) |
| Ovidiu Cracium | Roberto Tamburello |
| Michael Sullivan | Roberto Tamburello |
| … | … |

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13.) **Write a SQL query to find the names of all employees whose last name is exactly 5 characters long.**

Use the built-in LEN(str) function.

|  |  |
| --- | --- |
| **FirstName** | **LastName** |
| Kevin | Brown |
| Terri | Duffy |
| Jo | Brown |
| Diane | Glimp |
| … | … |

You should submit a SQL file as a part of your homework.

14.) **Write a SQL query to display the current date and time in the following format "day.month.year hour:minutes:seconds:milliseconds".**

Search in Google to find how to format dates in SQL Server.

|  |
| --- |
| **DateTIme** |
| 11.02.2015 18:50:02:960 |

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15.) **Write a SQL statement to create a table Users.**

Users should have username, password, full name and last login time. Choose appropriate data types for the table fields. Define a primary key column with a primary key constraint. Define the primary key column as identity to facilitate inserting records. Define unique constraint to avoid repeating usernames. Define a check constraint to ensure the password is at least 5 characters long.

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16.) **Write a SQL statement to create a view that displays the users from the Users table that have been in the system today.**

Test if the view works correctly.

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17.) **Write a SQL statement to create a table Groups.**

Groups should have unique name (use unique constraint). Define primary key and identity column.

You should submit a SQL file as a part of your homework.

18.) **Write a SQL statement to add a column GroupID to the table Users.**

Fill some data in this new column and as well in the Groups table. Write a SQL statement to add a foreign key constraint between tables Users and Groups tables.

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19.) **Write SQL statements to insert several records in the Users and Groups tables.**

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20.) **Write SQL statements to update some of the records in the Users and Groups tables.**

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21.) **Write SQL statements to delete some of the records from the Users and Groups tables.**

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22.) **Write SQL statements to insert in the Users table the names of all employees from the Employees table.**

Combine the first and last names as a full name. For username use the first letter of the first name + the last name (in lowercase). Use the same for the password, and NULL for last login time.

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23.) **Write a SQL statement that changes the password to NULL for all users that have not been in the system since 10.03.2010.**

You should submit a SQL file as a part of your homework.

24.) **Write a SQL statement that deletes all users without passwords (NULL password).**

You should submit a SQL file as a part of your homework.

25.) **Write a SQL query to display the average employee salary by department and job title.**

|  |  |  |
| --- | --- | --- |
| **Department** | **Job Title** | **Average Salary** |
| Finance | Accountant | 26400.00 |
| Finance | Accounts Manager | 34700.00 |
| Finance | Accounts Payable Specialist | 19000.00 |
| Finance | Accounts Receivable Specialist | 19000.00 |
| … | … | … |

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26.) **Write a SQL query to display the minimal employee salary by department and job title along with the name of some of the employees that take it.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Department** | **Job Title** | **First Name** | **Min Salary** |
| Engineering | Engineering Manager | Roberto | 43300.00 |
| Engineering | Senior Design Engineer | Michael | 36100.00 |
| Engineering | Vice President of Engineering | Terri | 63500.00 |
| Executive | Chief Executive Officer | Ken | 125500.00 |
| … | … |  | … |

You should submit a SQL file as a part of your homework.

27.) **Write a SQL query to display the town where maximal number of employees work.**

|  |  |
| --- | --- |
| **Name** | **Number of employees** |
| Seattle | 44 |

You should submit a SQL file as a part of your homework.

28.) **Write a SQL query to display the number of managers from each town.**

|  |  |
| --- | --- |
| **Town** | **Number of managers** |
| Bellevue | 22 |
| Berlin | 1 |
| Bordeaux | 1 |
| Bothell | 12 |

You should submit a SQL file as a part of your homework.

29.) **Write a SQL to create table WorkHours to store work reports for each employee.**

Each employee should have id, date, task, hours and comments. Don't forget to define identity, primary key and appropriate foreign key.

You should submit a SQL file as a part of your homework.

30.) **Issue few SQL statements to insert, update and delete of some data in the table.**

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31.) **Define a table WorkHoursLogs to track all changes in the WorkHours table with triggers.**

For each change keep the old record data, the new record data and the command (insert / update / delete).

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32.) **Start a database transaction, delete all employees from the 'Sales' department along with all dependent records from the pother tables. At the end rollback the transaction.**

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33.) **Start a database transaction and drop the table EmployeesProjects.**

Then how you could restore back the lost table data?

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34.) **Find how to use temporary tables in SQL Server.**

Using temporary tables backup all records from EmployeesProjects and restore them back after dropping and re-creating the table.

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