Homework: Advanced SQL

This document defines the homework assignments from the "Databases" Course @ Software University. Please submit as homework a single zip / rar / 7z archive holding the solutions (source code) of all below described problems.

Problem 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.

Problem 2. Write a SQL guery 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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Problem 3. Write a SQL guery to find the full name, salary and department of the employees that take the minimal salary in their department.

Use a nested SELECT statement.

| FirstName | LastName | Salary |
|------------------|----------|-------------|
| Gail Erickson | 32700.00 | Engineering |
| Jossef Goldberg | 32700.00 | Engineering |
| Sharon Salavaria | 32700.00 | Engineering |
| Gancho D'Hers | 25000.00 | Tool Design |
| | | |





















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

| FirstName | Average Salary |
|---------------|----------------|
| Gail Erickson | 32700.00 |

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

| Average Salary for Sales Department |
|-------------------------------------|
| 18403.7671 |

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

| Sales Employees Count |
|-----------------------|
| 292 |

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

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

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

| Employees without manager |
|---------------------------|
| 3 |

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Problem 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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Problem 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 |
| Redmond | Engineering | 1 |
| Renton | Engineering | 4 |
| | | |

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Problem 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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Problem 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)".

| FirstName | Manager |
|------------------|--------------------|
| Martin Kulov | No manager |
| George Denchev | No manager |
| Ovidiu Cracium | Roberto Tamburello |
| Michael Sullivan | Roberto Tamburello |
| | |























Problem 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 | Manager |
|-----------|---------|
| Kevin | Brown |
| Terri | Duffy |
| Jo | Brown |
| Diane | Glimp |
| | |

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Problem 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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Problem 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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Problem 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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Problem 17. Write a SQL statement to create a table Groups.

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

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

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

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

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Problem 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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Problem 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.

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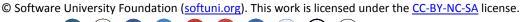
Problem 24. Write a SQL statement that deletes all users without passwords (NULL password).

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Problem 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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Problem 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 |
| ••• | | | |

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

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

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

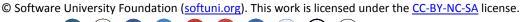
| Town | Number of managers |
|---------------|--------------------|
| Issaquah | 3 |
| Kenmore | 5 |
| Monroe | 2 |
| Newport Hills | 1 |

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Problem 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.





















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

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

Then how you could restore back the lost table data?

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Problem 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 recreating the table.

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