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 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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Problem 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.

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
…	…	…

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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

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

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
…	…

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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 re-creating the table.

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