Beihang University   Beijing, April 20th, 2021
School of General Engineering   Lin Wei and Yida Ding

Data Management and Artificial Intelligence
Lab Class 8

Task 1 *Advanced SQL queries* *(20 minutes)*

1. Compute the average, minimum and maximum salaries that the managers of each department get during their tenures. Note that only the salaries in the tenures are considered. The salaries with "from_date" or "to_date" not in the tenure are not computed.

2. Try to answer this question: To become the manager of each department, which titles an employee should get? Hint: Try to find the titles of the department managers during their tenures. Note that if an employee becomes a department manager when he/she is on a title, this title should also be printed.

Task 2 *Comprehend Indexing* *(20 minutes)*

For each of the following queries, compare the run time between using an appropriate index and the time without using an index.

1. Select all employees (their emp_no) whose salary is exactly 70000.

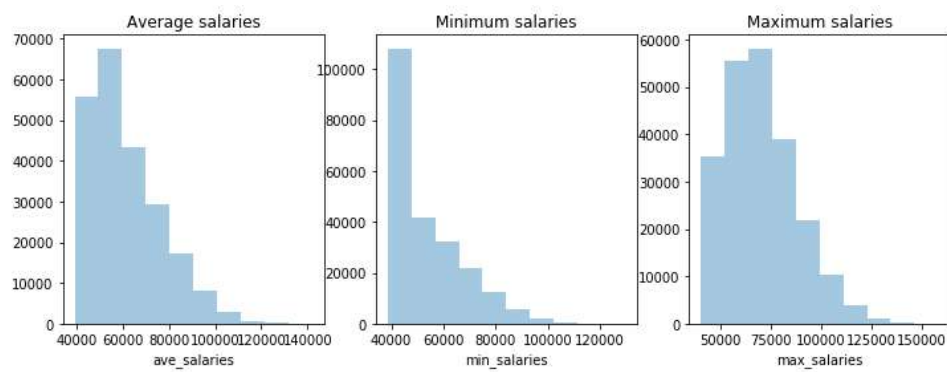2. Select all employees (their emp_no) whose first name is Dietrich.

Task 3 *SQL Queries with View* *(10 minutes)*

1. Create a view which computes the current average salaries and the number of employees for each department.

2. Create a view which computes the current min salaries and the number of employees for each title.
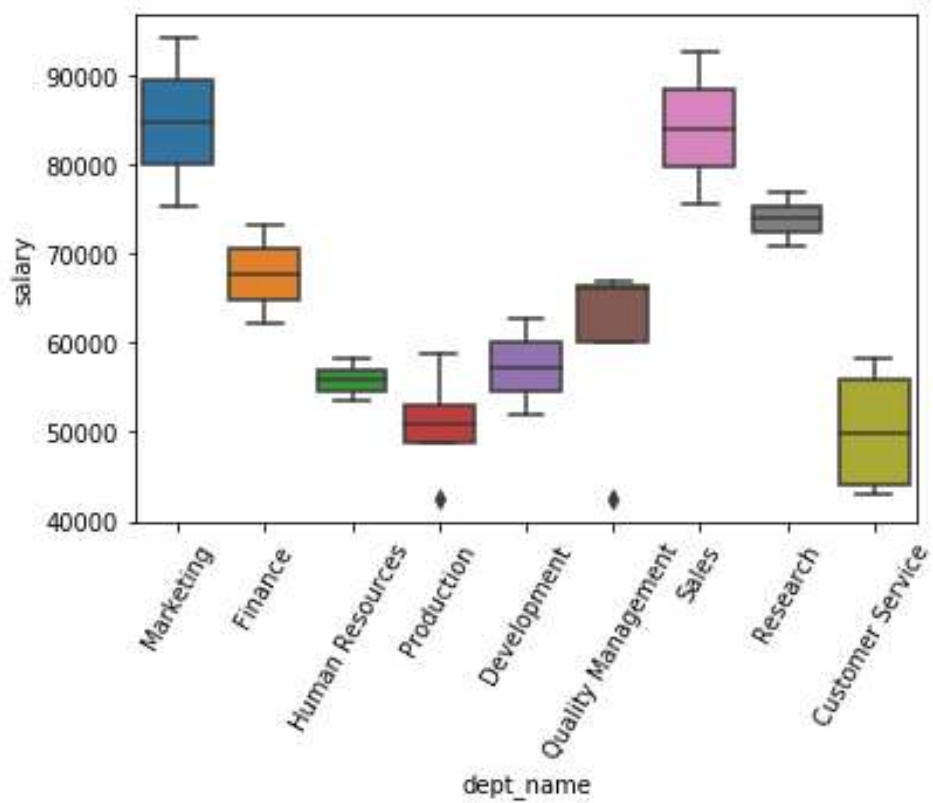
Task 4 *Advanced SQL queries + Visualization* *(20 minutes)*

1. Visualize the distribution of average, minimum and maximum salaries that each employee has ever got, using three subfigures of seaborn.distplot().

2. Visualize the distribution of average salaries that the managers of each department get during their tenures, using seaborn.boxplot().

The desired output figures are as follows:

Task3-1

Task3-2