Week 02: SQL Practice Tasks

Online IDE for practice: <http://www.sqlfiddle.com/>

Practice document: <https://github.com/NYU-DataScienceBootCamp/Week-2-SQL/blob/main/SQL_Practice.pdf>

|  |
| --- |
| **NOTE:** Make sure you answer the queries in the boxes given and paste screenshots in the output box.  **The solution queries will be posted on June 24th before the session** |

# Input Data

Use the database which was discussed during the session and feel free to change the attributes of the tables. Make sure that the following conditions are satisfied:

* There are three “tables”. One for storing Employee Details, One for Bonus, and One for Employee Title.
* There are at least 12 employees in the table which stores Employee Details.

NOTE: Make sure that you paste your input data in the box given below

|  |
| --- |
| CREATE TABLE Employee (  EMPLOYEE\_ID INT NOT NULL PRIMARY KEY AUTO\_INCREMENT,  FIRST\_NAME CHAR(25),  LAST\_NAME CHAR(25),  SALARY INT(15),  JOINING\_DATE DATETIME,  DEPARTMENT CHAR(25)  );  INSERT INTO Employee  (EMPLOYEE\_ID, FIRST\_NAME, LAST\_NAME, SALARY, JOINING\_DATE,  DEPARTMENT) VALUES  (001, 'Neville', 'Longbottom', 100000, '14-02-20 09.00.00', 'HR'),  (002, 'Ronald', 'Weasley', 80000, '14-06-11 09.00.00', 'Admin'),  (003, 'Hermoine', 'Granger', 300000, '14-02-20 09.00.00', 'HR'),  (004, 'Harry', 'Potter', 500000, '14-02-20 09.00.00', 'Admin'),  (005, 'Severus', 'Snape', 500000, '14-06-11 09.00.00', 'Admin'),  (006, 'Luna', 'Lovegood', 200000, '14-06-11 09.00.00', 'Account'),  (007, 'Draco', 'Malfoy', 75000, '14-01-20 09.00.00', 'Account'),  (008, 'Minerva', 'Mcgonagall', 90000, '14-04-11 09.00.00', 'Admin'),  (009, 'Sirius', 'Black', 85000, '14-04-12 09.00.00', 'Admin'),  (010, 'Ginny', 'Weasly', 78000, '14-05-11 09.00.00', 'HR'),  (011, 'Albus', 'Dumbledore', 900000, '14-06-21 09.00.00', 'Account'),  (012, 'Fred', 'Weasley', 69000, '14-08-10 09.00.00', 'Account');  CREATE TABLE Bonus (  EMPLOYEE\_REF\_ID INT,  BONUS\_AMOUNT INT(10),  BONUS\_DATE DATETIME,  FOREIGN KEY (EMPLOYEE\_REF\_ID)  REFERENCES Employee(EMPLOYEE\_ID)  ON DELETE CASCADE  );  INSERT INTO Bonus  (EMPLOYEE\_REF\_ID, BONUS\_AMOUNT, BONUS\_DATE) VALUES  (001, 5000, '16-02-20'),  (002, 3000, '16-06-11'),  (003, 4000, '16-02-20'),  (001, 4500, '16-02-20'),  (002, 3500, '16-06-11');  CREATE TABLE Title (  EMPLOYEE\_REF\_ID INT,  EMPLOYEE\_TITLE CHAR(25),  AFFECTED\_FROM DATETIME,  FOREIGN KEY (EMPLOYEE\_REF\_ID)  REFERENCES Employee(EMPLOYEE\_ID)  ON DELETE CASCADE  );  INSERT INTO Title  (EMPLOYEE\_REF\_ID, EMPLOYEE\_TITLE, AFFECTED\_FROM) VALUES  (001, 'Manager', '2016-02-20 00:00:00'),  (002, 'Executive', '2016-06-11 00:00:00'),  (008, 'Executive', '2016-06-11 00:00:00'),  (005, 'Manager', '2016-06-11 00:00:00'),  (004, 'Assistant Manager', '2016-06-11 00:00:00'),  (007, 'Executive', '2016-06-11 00:00:00'),  (006, 'Lead', '2016-06-11 00:00:00'),  (003, 'Lead', '2016-06-11 00:00:00'); |

# Tasks

## SELECTing data

* Display the entire table containing the details of all the Employees  
    
  **QUERY:**

|  |
| --- |
| SELECT \* FROM EMPLOYEE |

**OUTPUT:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **EMPLOYEE\_ID** | **FIRST\_NAME** | **LAST\_NAME** | **SALARY** | **JOINING\_DATE** | **DEPARTMENT** | | 1 | Neville | Longbottom | 100000 | 2014-02-20T09:00:00Z | HR | | 2 | Ronald | Weasley | 80000 | 2014-06-11T09:00:00Z | Admin | | 3 | Hermoine | Granger | 300000 | 2014-02-20T09:00:00Z | HR | | 4 | Harry | Potter | 500000 | 2014-02-20T09:00:00Z | Admin | | 5 | Severus | Snape | 500000 | 2014-06-11T09:00:00Z | Admin | | 6 | Luna | Lovegood | 200000 | 2014-06-11T09:00:00Z | Account | | 7 | Draco | Malfoy | 75000 | 2014-01-20T09:00:00Z | Account | | 8 | Minerva | Mcgonagall | 90000 | 2014-04-11T09:00:00Z | Admin | | 9 | Sirius | Black | 85000 | 2014-04-12T09:00:00Z | Admin | | 10 | Ginny | Weasly | 78000 | 2014-05-11T09:00:00Z | HR | | 11 | Albus | Dumbledore | 900000 | 2014-06-21T09:00:00Z | Account | | 12 | Fred | Weasley | 69000 | 2014-08-10T09:00:00Z | Account | |

* Write a query to fetch “FIRST\_NAME” from the Employees table in the UPPER CASE  
    
  **QUERY:**

|  |
| --- |
| SELECT UPPER( FIRST\_NAME ) AS FIRST\_NAME FROM EMPLOYEE |

**OUTPUT:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  | | --- | | **FIRST\_NAME** | | NEVILLE | | RONALD | | HERMOINE | | HARRY | | SEVERUS | | LUNA | | DRACO | | MINERVA | | SIRIUS | | GINNY | | ALBUS | | FRED | |

## GROUPing them together

* Write a query to fetch the number of Employees for each department in the descending order  
    
  **QUERY:**

|  |
| --- |
| SELECT DEPARTMENT, COUNT( \* ) AS EMPLOYEE\_COUNT FROM EMPLOYEE GROUP BY DEPARTMENT ORDER BY EMPLOYEE\_COUNT DESC |

**OUTPUT:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | **DEPARTMENT** | **EMPLOYEE\_COUNT** | | Admin | 5 | | Account | 4 | | HR | 3 | |

## Using WHERE somewhere

* Write a query to fetch the names of the Employees with salaries >= 90000 and <= 200000  
    
  **QUERY:**

|  |
| --- |
| SELECT CONCAT( FIRST\_NAME , ' ', LAST\_NAME ) AS NAME FROM EMPLOYEE  WHERE SALARY >= 90000 AND SALARY <= 200000 |

**OUTPUT:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| |  | | --- | | **NAME** | | Neville Longbottom | | Luna Lovegood | | Minerva Mcgonagall | |

## JOINing the tables

* Write a query to print details of Employees who are also “Managers”  
    
  **QUERY:**

|  |
| --- |
| SELECT FIRST\_NAME, LAST\_NAME, SALARY, JOINING\_DATE, DEPARTMENT FROM EMPLOYEE E, TITLE T  WHERE E.EMPLOYEE\_ID = T.EMPLOYEE\_REF\_ID AND T.EMPLOYEE\_TITLE = 'Manager' |

**OUTPUT:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | **FIRST\_NAME** | **LAST\_NAME** | **SALARY** | **JOINING\_DATE** | **DEPARTMENT** | | Neville | Longbottom | 100000 | 2014-02-20T09:00:00Z | HR | | Severus | Snape | 500000 | 2014-06-11T09:00:00Z | Admin | |

## COPYing

* Write an SQL query to clone a new table from another table  
    
  **QUERY:**

|  |
| --- |
| CREATE TABLE EMPLOYEE\_CLONE  AS ( SELECT \* FROM EMPLOYEE )  SELECT \* FROM EMPLOYEE\_CLONE |

**OUTPUT:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **EMPLOYEE\_ID** | **FIRST\_NAME** | **LAST\_NAME** | **SALARY** | **JOINING\_DATE** | **DEPARTMENT** | | 1 | Neville | Longbottom | 100000 | 2014-02-20T09:00:00Z | HR | | 2 | Ronald | Weasley | 80000 | 2014-06-11T09:00:00Z | Admin | | 3 | Hermoine | Granger | 300000 | 2014-02-20T09:00:00Z | HR | | 4 | Harry | Potter | 500000 | 2014-02-20T09:00:00Z | Admin | | 5 | Severus | Snape | 500000 | 2014-06-11T09:00:00Z | Admin | | 6 | Luna | Lovegood | 200000 | 2014-06-11T09:00:00Z | Account | | 7 | Draco | Malfoy | 75000 | 2014-01-20T09:00:00Z | Account | | 8 | Minerva | Mcgonagall | 90000 | 2014-04-11T09:00:00Z | Admin | | 9 | Sirius | Black | 85000 | 2014-04-12T09:00:00Z | Admin | | 10 | Ginny | Weasly | 78000 | 2014-05-11T09:00:00Z | HR | | 11 | Albus | Dumbledore | 900000 | 2014-06-21T09:00:00Z | Account | | 12 | Fred | Weasley | 69000 | 2014-08-10T09:00:00Z | Account | |

## Aliasing

* Find the average salary of employees in each department and name the AVG(SALARY) column as “AverageSalary”  
    
  **QUERY:**

|  |
| --- |
| SELECT DEPARTMENT, AVG( SALARY ) AS 'AverageSalary' FROM EMPLOYEE GROUP BY DEPARTMENT |

**OUTPUT:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | **DEPARTMENT** | **AverageSalary** | | Account | 311000 | | Admin | 251000 | | HR | 159333.3333 | |

## Some other stuff

* Write an SQL query to show the second-highest salary from a table  
    
  **QUERY:**

|  |
| --- |
| SELECT MAX( SALARY ) FROM EMPLOYEE WHERE SALARY NOT IN  ( SELECT MAX( SALARY ) FROM EMPLOYEE ) |

**OUTPUT:**

|  |  |  |
| --- | --- | --- |
| |  | | --- | | **MAX( SALARY )** | | 500000 | |

* Write an SQL query to show one row twice in results from a table

**QUERY:**

|  |
| --- |
| SELECT \* FROM EMPLOYEE LIMIT 1  UNION ALL  SELECT \* FROM EMPLOYEE |

**OUTPUT:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **EMPLOYEE\_ID** | **FIRST\_NAME** | **LAST\_NAME** | **SALARY** | **JOINING\_DATE** | **DEPARTMENT** | | 1 | Neville | Longbottom | 100000 | 2014-02-20T09:00:00Z | HR | | 1 | Neville | Longbottom | 100000 | 2014-02-20T09:00:00Z | HR | | 2 | Ronald | Weasley | 80000 | 2014-06-11T09:00:00Z | Admin | | 3 | Hermoine | Granger | 300000 | 2014-02-20T09:00:00Z | HR | | 4 | Harry | Potter | 500000 | 2014-02-20T09:00:00Z | Admin | | 5 | Severus | Snape | 500000 | 2014-06-11T09:00:00Z | Admin | | 6 | Luna | Lovegood | 200000 | 2014-06-11T09:00:00Z | Account | | 7 | Draco | Malfoy | 75000 | 2014-01-20T09:00:00Z | Account | | 8 | Minerva | Mcgonagall | 90000 | 2014-04-11T09:00:00Z | Admin | | 9 | Sirius | Black | 85000 | 2014-04-12T09:00:00Z | Admin | | 10 | Ginny | Weasly | 78000 | 2014-05-11T09:00:00Z | HR | | 11 | Albus | Dumbledore | 900000 | 2014-06-21T09:00:00Z | Account | | 12 | Fred | Weasley | 69000 | 2014-08-10T09:00:00Z | Account | |

* Write an SQL query to fetch the departments that have less than five people in it  
    
  **QUERY:**

|  |
| --- |
| SELECT DEPARTMENT, COUNT(EMPLOYEE\_ID) AS EMPLOYEE\_COUNT FROM EMPLOYEE  GROUP BY DEPARTMENT  HAVING EMPLOYEE\_COUNT <5 |

**OUTPUT:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | **DEPARTMENT** | **EMPLOYEE\_COUNT** | | Account | 4 | | HR | 3 | |

* Write an SQL query to fetch the last five records from a table  
    
  **QUERY:**

|  |
| --- |
| SELECT \* FROM( SELECT \* FROM EMPLOYEE ORDER BY EMPLOYEE\_ID DESC LIMIT 5 ) AS E  ORDER BY EMPLOYEE\_ID |

**OUTPUT:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **EMPLOYEE\_ID** | **FIRST\_NAME** | **LAST\_NAME** | **SALARY** | **JOINING\_DATE** | **DEPARTMENT** | | 8 | Minerva | Mcgonagall | 90000 | 2014-04-11T09:00:00Z | Admin | | 9 | Sirius | Black | 85000 | 2014-04-12T09:00:00Z | Admin | | 10 | Ginny | Weasly | 78000 | 2014-05-11T09:00:00Z | HR | | 11 | Albus | Dumbledore | 900000 | 2014-06-21T09:00:00Z | Account | | 12 | Fred | Weasley | 69000 | 2014-08-10T09:00:00Z | Account | |