深 圳 大 学 实 验 报 告

课程名称：　　　　　　　数据库系统　　　　　　　

实验项目名称：　　SQL 的 DDL 语言和单表查询　　　

学院：　　Computer Science and Software Engineering　　

专业：　　　　　Computer Science　　　　　　　

指导教师：　　　　　Basker George　　　　　　

报告人：林宪亮　_学号：2022150130_班级：　　国际班　　

实验时间：　　　17th September 2024　　　　　

实验报告提交时间：　　17th September 2024　　　

教务部制

実验目的与要求：**(Purpose of Experiment purpose and Requirements)**
* Please show all work for these problems.
Just writing down the answer will not get full credit.

SQL的DDL语言和单表查询

Note: create a Table EMP and DEPT with all required constraints both Integrity and Referential Integrity Constraint.

EMP Table:

EMPNO	PRIMARY KEY NOT NULL IF PRIMARY KEY MODIFED THEN CHILD MUST BE UPDATED	NUMBER(4)
ENAME	NOT NULL	VARCHAR2(10)
JOB	NOT NULL	VARCHAR2(9)
MGR	REFERENCES EMP(EMPNO)	NUMBER(4)
HIREDATE		DATE
SAL	NOT NULL AND MORE THAN 5000	NUMBER(7,2)
COMM		NUMBER(7,2)
DEPTNO	REFERENCES DEPT TABLE DEFAULT 10	NUMBER(2)

DEPT TABLE:

DEPTNO	PRIMARY KEY NOT NULL DON'T ALLOW PRIMARY KEY TO BE MODIFIED IF CHILD RECORD EXIST	NUMBER(2)
DNAME		CHAR(10)
LOC		CHAR(10)

INSERT TUPLES FOR EMP TABLE:

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	17-DEC-90	13750	NULL	20
7499	ALLEN	SALESMAN	7698	20-FEB-89	19000	6400	30
7521	WARD	SALESMAN	7698	22-FEB-93	18500	4250	30
7566	JONES	MANAGER	7839	02-APR-89	26850		20
7654	MARTIN	SALESMAN	7698	28-SEP-97	15675	3500	30
7698	BLAKE	MANAGER	7839	01-MAY-90	24000		30
7782	CLARK	MANAGER	7839	09-JUN-88	27500		10
7788	SCOTT	ANALYST	7566	19-APR-87	19500		20
7839	KING	PRESIDENT		17-NOV-83	82500		10
7844	TURNER	SALESMAN	7698	08-SEP-92	18500	6250	30
7876	ADAMS	CLERK	7788	23-MAY-96	11900		20
7900	JAMES	CLERK	7698	03-DEC-95	12500		30
7902	FORD	ANALYST	7566	03-DEC-91	21500		20
7934	MILLER	CLERK	7782	23-JAN-95	13250		10
EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
3258	GREEN	SALESMAN	4422	24-JUL-95	18500	2750	50
4422	STEVENS	MANAGER	7839	14-JAN-94	24750		50
6548	BARNES	CLERK	4422	16-JAN-95	11950		50
7500	CAMPBELL	ANALYST	7566	30-OCT-92	24500	0	40

INSERT TUPLES FOR DEPT TABLE:

DEPTNO	DNAME	LOC
10	ACCOUNTING	LONDON
30	SALES	LIVERPOOL
40	OPERATIONS	STAFFORD
50	MARKETING	LUTON
20	RESEARCH	PRESTON

1   List all information about the employees.
2   List all information about the departments
3   List only the following information from the EMP table (Employee name, employee number, salary, department number)
4   List details of employees in departments 10 and 30.
5   List all the jobs in the EMP table eliminating duplicates.

6. What are the names of the employees who earn less than £20,000?
7. What is the name, job title and employee number of the person in department 20 who earns more than £25000?
8. Find all employees whose job is either Clerk or Salesman.
9. Find any Clerk who is not in department 10.
10. Find everyone whose job is Salesman and all the Analysts in department 20.
11. Find all the employees who earn between £15,000 and £20,000. Show the employee name, department and salary.
12 Find the name of the President.
13 Find all the employees whose last names end with S
14 List the employees whose names have TH or LL in them
15 List only those employees who receive commission.
16 Find the name, job, salary, hiredate, and department number of all employees by alphabetical order of name.
17. Find the name, job, salary, hiredate and department number of all employees in ascending order by their salaries.
18. List all salesmen in descending order by commission divided by their salary.
19. Order employees in department 30 who receive commision, in ascending order by commission
20 Find the names, jobs, salaries and commissions of all employees who do not have managers.
21 Find all the salesmen in department 30 who have a salary greater than or equal to £18000.
22 Find the employees who were hired before 01-Jan-1998 and have salary above 5000 or below 1000.
23 What is the command to add primary key constraint to EMPNO
24 What is the command to add a new column EMP_family_name to existing EMP table
25 How to drop primary key constraint for EMPNO
26 rename EMP table to EMPLOYEE
27 rename EMPLOYEE   back to EMP
28 What is the SQL command to remove column EMP_family_name from EMP table
29 What is the SQL command to copy emp table to employee table
30 What is the SQL command to drop employee table
31 What is the SQL command to find the employee whose commission is NULL

实验过程及内容：(**Methods and steps**)
Use PHPMYADMIN/WAMP Server to complete the exercise

1. Environment Setup

I use VSCode for database operations.
Simply download the following two extensions in VSCode: MySQL and MySQL Syntax. Once installed, a database icon will appear on the sidebar. Click on the icon to establish a connection, create a new database, and you're ready to start working.
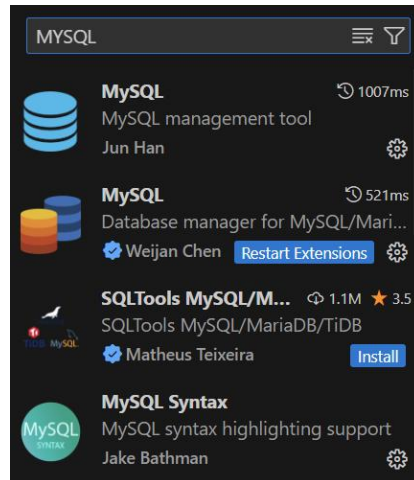

Figure 1: Extension Download

Download the second and fourth extensions as shown in the figure.

2. Creating Tables and Inserting Data

2.1 Creating Tables

The experiment requires me to create two tables, DEPT and EMP. Simply click the "New Table" button under the 'Tables' folder and input the table creation code according to the experiment requirements.
The specific code is shown in the figure below:

```
CREATE TABLE DEPT (
    DEPTNO INT PRIMARY KEY,
    DNAME VARCHAR(50) NOT NULL,
    LOC VARCHAR(50),
    UNIQUE (DNAME)
);
```

Figure 2: Creation of the DEPT Table

```
CREATE TABLE EMP (
    EMPNO INT PRIMARY KEY,                  --
    ENAME VARCHAR(50) NOT NULL,             --
    JOB VARCHAR(50) NOT NULL,               --
    MGR INT,                                --
    HIREDATE DATE,                          --
    SAL DECIMAL(10, 2) CHECK (SAL > 0),     --
    COMM DECIMAL(10, 2),                    --
    DEPTNO INT,                             --
    FOREIGN KEY (DEPTNO) REFERENCES DEPT(DEPTNO)
);
```

Figure 3: Creation of the EMP Table

After editing the code, simply click the run button, and the table will be successfully created.

2.2 Inserting Data

There are two main ways to insert data: one is by using code, and the second is by using the built-in import feature of the compiler. Below, I will demonstrate both methods.

2.2.1 Inserting Data via Code

```
INSERT INTO EMP (EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, COMM, DEPTNO) VALUES
(7499, 'ALLEN', 'SALESMAN', 7698, '1989-02-20', 19000, 6400, 30),
(7521, 'WARD', 'SALESMAN', 7698, '1993-02-22', 18500, 4250, 30),
(7566, 'JONES', 'MANAGER', 7839, '1989-04-02', 26850, NULL, 20),
(7654, 'MARTIN', 'SALESMAN', 7698, '1997-09-28', 15675, 3500, 30),
(7698, 'BLAKE', 'MANAGER', 7839, '1990-05-01', 24000, NULL, 30),
(7782, 'CLARK', 'MANAGER', 7839, '1988-06-09', 27500, NULL, 10),
(7788, 'SCOTT', 'ANALYST', 7566, '1987-04-19', 19500, NULL, 20),
(7839, 'KING', 'PRESIDENT', NULL, '1983-11-17', 82500, NULL, 10),
(7844, 'TURNER', 'SALESMAN', 7698, '1992-09-08', 18500, 6250, 30),
(7876, 'ADAMS', 'CLERK', 7788, '1996-05-23', 11900, NULL, 20),
(7900, 'JAMES', 'CLERK', 7698, '1995-12-03', 12500, NULL, 30),
(7902, 'FORD', 'ANALYST', 7566, '1991-12-03', 21500, NULL, 20),
(7934, 'MILLER', 'CLERK', 7782, '1995-01-23', 13250, NULL, 10);
▷ Run | New Tab | Copy
INSERT INTO EMP (EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, COMM, DEPTNO) VALUES
(3258,'GREEN','SALESMAN',4422,'1995-7-24',18500,2750,50),
(4422,'STEVENS','MANAGER',7839,'1994-01-14',24750,NULL,50),
(6548,'BARNES','CLERK',4422,'1995-01-16',11950,NULL,50),
(7500,'CAMPBELL','ANALYST',7566,'1992-10-30',24500,0,40);
```
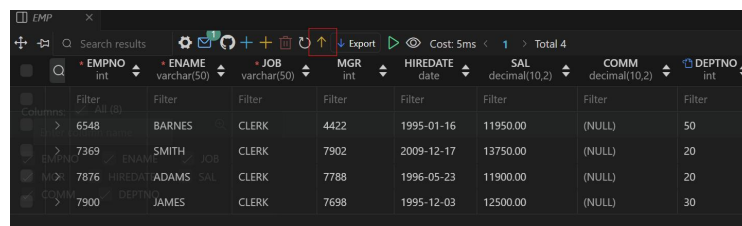
Figure 4: Inserting Data

As shown in Figure 4, you can insert new rows using the INSERT statement. However, this method requires entering data one row at a time, which is less efficient.

2.2.2 Import Feature

The import feature allows you to bulk import data more efficiently compared to entering rows manually.

Figure 5: Importing Data

As shown in Figure 5, click the import icon in the red box, select the file containing your data (in this experiment, it's a .csv file), and the data rows will be imported into the database. This method is much more efficient and faster.

3. Completing the Exercise

Due to the large number of questions, I will not display all results individually. Instead, I will show the results of a few selected queries.

1. List all information about the employees.
   SELECT * FROM EMP;

EMPNO int	ENAME varchar(50)	JOB varchar(50)	MGR int	HIREDATE date	SAL decimal(10,2)	COMM decimal(10,2)	DEPTNO int
Filter	Filter	Filter	Filter	Filter	Filter	Filter	Filter
3258	GREEN	SALESMAN	4422	1995-07-24	18500.00	2750.00	50
4422	STEVENS	MANAGER	7839	1994-01-14	24750.00	(NULL)	50
6548	BARNES	CLERK	4422	1995-01-16	11950.00	(NULL)	50
7369	SMITH	CLERK	7902	2009-12-17	13750.00	(NULL)	20
7499	ALLEN	SALESMAN	7698	1989-02-20	19000.00	6400.00	30
7500	CAMPBELL	ANALYST	7566	1992-10-30	24500.00	0.00	40
7521	WARD	SALESMAN	7698	1993-02-22	18500.00	4250.00	30
7566	JONES	MANAGER	7839	1989-04-02	26850.00	(NULL)	20
7654	MARTIN	SALESMAN	7698	1997-09-28	15675.00	3500.00	30
7698	BLAKE	MANAGER	7839	1990-05-01	24000.00	(NULL)	30
7782	CLARK	MANAGER	7839	1988-06-09	27500.00	(NULL)	10

Figure 6: Result of Question 1

2. List all information about the departments
   SELECT * FROM DEPT;

DEPTNO int	DNAME varchar(50)	LOC varchar(50)
Filter	Filter	Filter
10	ACCOUNTING	LONDON
20	RESEARCH	PRESTON
30	SALES	LIVERPOOL
40	OPERATIONS	STAFFORD
50	MARKETING	LUTON

Figure 7: Result of Question 2

3. List only the following information from the EMP table (Employee name, employee number, salary, department number)
   SELECT ENAME,EMPNO,SAL,DEPTNO FROM EMP;

ENAME varchar(50)	EMPNO int	SAL decimal(10,2)	DEPTNO int
Filter	Filter	Filter	Filter
GREEN	3258	18500.00	50
STEVENS	4422	24750.00	50
BARNES	6548	11950.00	50
SMITH	7369	13750.00	20
ALLEN	7499	19000.00	30
CAMPBELL	7500	24500.00	40
WARD	7521	18500.00	30
JONES	7566	26850.00	20
MARTIN	7654	15675.00	30
BLAKE	7698	24000.00	30
CLARK	7782	27500.00	10

Figure 8: Result of Question 3

4. List details of employees in departments 10 and 30.
   SELECT * FROM EMP WHERE DEPTNO IN (10,30);

EMPNO int	ENAME varchar(50)	JOB varchar(50)	MGR int	HIREDATE date	SAL decimal(10,2)	COMM decimal(10,2)	DEPTNO int
Filter	Filter	Filter	Filter	Filter	Filter	Filter	Filter
7782	CLARK	MANAGER	7839	1988-06-09	27500.00	(NULL)	10
7839	KING	PRESIDENT	(NULL)	1983-11-17	82500.00	(NULL)	10
7934	MILLER	CLERK	7782	1995-01-23	13250.00	(NULL)	10
7499	ALLEN	SALESMAN	7698	1989-02-20	19000.00	6400.00	30
7521	WARD	SALESMAN	7698	1993-02-22	18500.00	4250.00	30
7654	MARTIN	SALESMAN	7698	1997-09-28	15675.00	3500.00	30
7698	BLAKE	MANAGER	7839	1990-05-01	24000.00	(NULL)	30
7844	TURNER	SALESMAN	7698	1992-09-08	18500.00	6250.00	30
7900	JAMES	CLERK	7698	1995-12-03	12500.00	(NULL)	30

Figure 9: Result of Question 4

5. List all the jobs in the EMP table eliminating duplicates.
   SELECT DISTINCT JOB FROM EMP;

JOB varchar(50)
Filter
SALESMAN
MANAGER
CLERK
ANALYST
PRESIDENT

Figure 10: Result of Question 5

6. What are the names of the employees who earn less than £20,000?
   SELECT ENAME FROM EMP WHERE SAL<20000;

ENAME varchar(50)
Filter
GREEN
BARNES
SMITH
ALLEN
WARD
MARTIN
SCOTT
TURNER
ADAMS
JAMES
MILLER

Figure 11: Result of Question 6

7. What is the name, job title and employee number of the person in department 20 who earns more than £25000?

SELECT ENAME,JOB,EMPNO FROM EMP WHERE DEPTNO = 20 AND SAL >25000;

* ENAME varchar(50)	* JOB varchar(50)	* EMPNO int
Filter	Filter	Filter
JONES	MANAGER	7566

Figure 12: Result of Question 7

8. Find all employees whose job is either Clerk or Salesman.

SELECT * FROM EMP WHERE JOB IN ('CLERK','SALESMAN');

* EMPNO int	* ENAME varchar(50)	* JOB varchar(50)	MGR int	HIREDATE date	SAL decimal(10,2)	COMM decimal(10,2)	DEPTNO int
Filter	Filter	Filter	Filter	Filter	Filter	Filter	Filter
3258	GREEN	SALESMAN	4422	1995-07-24	18500.00	2750.00	50
6548	BARNES	CLERK	4422	1995-01-16	11950.00	(NULL)	50
7369	SMITH	CLERK	7902	2009-12-17	13750.00	(NULL)	20
7499	ALLEN	SALESMAN	7698	1989-02-20	19000.00	6400.00	30
7521	WARD	SALESMAN	7698	1993-02-22	18500.00	4250.00	30
7654	MARTIN	SALESMAN	7698	1997-09-28	15675.00	3500.00	30
7844	TURNER	SALESMAN	7698	1992-09-08	18500.00	6250.00	30
7876	ADAMS	CLERK	7788	1996-05-23	11900.00	(NULL)	20
7900	JAMES	CLERK	7698	1995-12-03	12500.00	(NULL)	30
7934	MILLER	CLERK	7782	1995-01-23	13250.00	(NULL)	10

Figure 13: Result of Question 8

9. Find any Clerk who is not in department 10.

SELECT * FROM EMP WHERE JOB ='CLERK' AND DEPTNO <> 10;

* EMPNO int	* ENAME varchar(50)	* JOB varchar(50)	MGR int	HIREDATE date	SAL decimal(10,2)	COMM decimal(10,2)	DEPTNO int
Filter	Filter	Filter	Filter	Filter	Filter	Filter	Filter
6548	BARNES	CLERK	4422	1995-01-16	11950.00	(NULL)	50
7369	SMITH	CLERK	7902	2009-12-17	13750.00	(NULL)	20
7876	ADAMS	CLERK	7788	1996-05-23	11900.00	(NULL)	20
7900	JAMES	CLERK	7698	1995-12-03	12500.00	(NULL)	30

Figure 14: Result of Question 9

10. Find everyone whose job is Salesman and all the Analysts in department 20.

SELECT * FROM EMP WHERE (JOB = 'SALESMAN') OR (JOB = 'ANALYST' AND DEPTNO = 20);

* EMPNO int	* ENAME varchar(50)	* JOB varchar(50)	MGR int	HIREDATE date	SAL decimal(10,2)	COMM decimal(10,2)	DEPTNO int
Filter	Filter	Filter	Filter	Filter	Filter	Filter	Filter
3258	GREEN	SALESMAN	4422	1995-07-24	18500.00	2750.00	50
7499	ALLEN	SALESMAN	7698	1989-02-20	19000.00	6400.00	30
7521	WARD	SALESMAN	7698	1993-02-22	18500.00	4250.00	30
7654	MARTIN	SALESMAN	7698	1997-09-28	15675.00	3500.00	30
7788	SCOTT	ANALYST	7566	1987-04-19	19500.00	(NULL)	20
7844	TURNER	SALESMAN	7698	1992-09-08	18500.00	6250.00	30
7902	FORD	ANALYST	7566	1991-12-03	21500.00	(NULL)	20

Figure 15: Result of Question 10

11. Find all the employees who earn between £15,000 and £20,000.Show the employee name, department and salary.

SELECT ENAME, DEPTNO, SAL FROM EMP WHERE SAL BETWEEN 15000 AND 20000;

ENAME varchar(50)	DEPTNO int	SAL decimal(10,2)
Filter	Filter	Filter
GREEN	50	18500.00
ALLEN	30	19000.00
WARD	30	18500.00
MARTIN	30	15675.00
SCOTT	20	19500.00
TURNER	30	18500.00

Figure 16: Result of Question 11

12. Find the name of the President.

SELECT ENAME FROM EMP WHERE JOB = 'PRESIDENT';

ENAME varchar(50)
Filter
KING

Figure 17: Result of Question 12

13. Find all the employees whose last names end with S

SELECT * FROM EMP WHERE ENAME LIKE '%S';

EMPNO int	ENAME varchar(50)	JOB varchar(50)	MGR int	HIREDATE date	SAL decimal(10,2)	COMM decimal(10,2)	DEPTNO int
Filter	Filter	Filter	Filter	Filter	Filter	Filter	Filter
4422	STEVENS	MANAGER	7839	1994-01-14	24750.00	(NULL)	50
6548	BARNES	CLERK	4422	1995-01-16	11950.00	(NULL)	50
7566	JONES	MANAGER	7839	1989-04-02	26850.00	(NULL)	20
7876	ADAMS	CLERK	7788	1996-05-23	11900.00	(NULL)	20
7900	JAMES	CLERK	7698	1995-12-03	12500.00	(NULL)	30

Figure 18: Result of Question 13

14. List the employees whose names have TH or LL in them

SELECT * FROM EMP WHERE ENAME LIKE '%TH%' OR ENAME LIKE '%LL%';

EMPNO int	ENAME varchar(50)	JOB varchar(50)	MGR int	HIREDATE date	SAL decimal(10,2)	COMM decimal(10,2)	DEPTNO int
Filter	Filter	Filter	Filter	Filter	Filter	Filter	Filter
7369	SMITH	CLERK	7902	2009-12-17	13750.00	(NULL)	20
7499	ALLEN	SALESMAN	7698	1989-02-20	19000.00	6400.00	30
7500	CAMPBELL	ANALYST	7566	1992-10-30	24500.00	0.00	40
7934	MILLER	CLERK	7782	1995-01-23	13250.00	(NULL)	10

Figure 19: Result of Question 14

15. List only those employees who receive commission.

SELECT * FROM EMP WHERE COMM IS NOT NULL;

EMPNO int	ENAME varchar(50)	JOB varchar(50)	MGR int	HIREDATE date	SAL decimal(10,2)	COMM decimal(10,2)	DEPTNO int
Filter	Filter	Filter	Filter	Filter	Filter	Filter	Filter
3258	GREEN	SALESMAN	4422	1995-07-24	18500.00	2750.00	50
7499	ALLEN	SALESMAN	7698	1989-02-20	19000.00	6400.00	30
7500	CAMPBELL	ANALYST	7566	1992-10-30	24500.00	0.00	40
7521	WARD	SALESMAN	7698	1993-02-22	18500.00	4250.00	30
7654	MARTIN	SALESMAN	7698	1997-09-28	15675.00	3500.00	30
7844	TURNER	SALESMAN	7698	1992-09-08	18500.00	6250.00	30

Figure 20: Result of Question 15

16. Find the name, job, salary, hiredate, and department number of all employees by alphabetical order of name.

SELECT ENAME, JOB, SAL, HIREDATE, DEPTNO FROM EMP ORDER BY ENAME;

ENAME varchar(50)	JOB varchar(50)	SAL decimal(10,2)	HIREDATE date	DEPTNO int
Filter	Filter	Filter	Filter	Filter
ADAMS	CLERK	11900.00	1996-05-23	20
ALLEN	SALESMAN	19000.00	1989-02-20	30
BARNES	CLERK	11950.00	1995-01-16	50
BLAKE	MANAGER	24000.00	1990-05-01	30
CAMPBELL	ANALYST	24500.00	1992-10-30	40
CLARK	MANAGER	27500.00	1988-06-09	10
FORD	ANALYST	21500.00	1991-12-03	20
GREEN	SALESMAN	18500.00	1995-07-24	50
JAMES	CLERK	12500.00	1995-12-03	30
JONES	MANAGER	26850.00	1989-04-02	20
KING	PRESIDENT	82500.00	1983-11-17	10

Figure 21: Result of Question 16

17. Find the name, job, salary, hiredate and department number of all employees in ascending order by their salaries.

SELECT ENAME, JOB, SAL, HIREDATE, DEPTNO FROM EMP ORDER BY SAL;

ENAME varchar(50)	JOB varchar(50)	SAL decimal(10,2)	HIREDATE date	DEPTNO int
Filter	Filter	Filter	Filter	Filter
ADAMS	CLERK	11900.00	1996-05-23	20
BARNES	CLERK	11950.00	1995-01-16	50
JAMES	CLERK	12500.00	1995-12-03	30
MILLER	CLERK	13250.00	1995-01-23	10
SMITH	CLERK	13750.00	2009-12-17	20
MARTIN	SALESMAN	15675.00	1997-09-28	30
GREEN	SALESMAN	18500.00	1995-07-24	50
WARD	SALESMAN	18500.00	1993-02-22	30
TURNER	SALESMAN	18500.00	1992-09-08	30

Figure 22: Result of Question 17

18. List all salesmen in descending order by commission divided by their salary.

SELECT * FROM EMP WHERE JOB = 'SALESMAN' ORDER BY COMM / SAL DESC;

* EMPNO int	* ENAME varchar(50)	* JOB varchar(50)	MGR int	HIREDATE date	SAL decimal(10,2)	COMM decimal(10,2)	DEPTNO int
Filter	Filter	Filter	Filter	Filter	Filter	Filter	Filter
7844	TURNER	SALESMAN	7698	1992-09-08	18500.00	6250.00	30
7499	ALLEN	SALESMAN	7698	1989-02-20	19000.00	6400.00	30
7521	WARD	SALESMAN	7698	1993-02-22	18500.00	4250.00	30
7654	MARTIN	SALESMAN	7698	1997-09-28	15675.00	3500.00	30
3258	GREEN	SALESMAN	4422	1995-07-24	18500.00	2750.00	50

Figure 23: Result of Question 18

19. Order employees in department 30 who receive commision, in ascending order by commission

SELECT * FROM EMP WHERE DEPTNO = 30 AND COMM IS NOT NULL ORDER BY COMM ASC;

* EMPNO int	* ENAME varchar(50)	* JOB varchar(50)	MGR int	HIREDATE date	SAL decimal(10,2)	COMM decimal(10,2)	DEPTNO int
Filter	Filter	Filter	Filter	Filter	Filter	Filter	Filter
7654	MARTIN	SALESMAN	7698	1997-09-28	15675.00	3500.00	30
7521	WARD	SALESMAN	7698	1993-02-22	18500.00	4250.00	30
7844	TURNER	SALESMAN	7698	1992-09-08	18500.00	6250.00	30
7499	ALLEN	SALESMAN	7698	1989-02-20	19000.00	6400.00	30

Figure 24: Result of Question 19

20. Find the names, jobs, salaries and commissions of all employees who do not have managers.

SELECT ENAME, JOB, SAL, COMM FROM EMP WHERE MGR IS NULL;

* ENAME varchar(50)	* JOB varchar(50)	SAL decimal(10,2)	COMM decimal(10,2)
Filter	Filter	Filter	Filter
KING	PRESIDENT	82500.00	(NULL)

Figure 25: Result of Question 20

21. Find all the salesmen in department 30 who have a salary greater than or equal to £18000.

SELECT ENAME FROM EMP WHERE JOB = 'SALESMAN' AND DEPTNO = 30 AND SAL >= 18000;

* ENAME varchar(50)
Filter
ALLEN
WARD
TURNER

Figure 26: Result of Question 21

22. Find the employees who were hired before 01-Jan-1998 and have salary above 5000 or below 1000.

SELECT * FROM EMP WHERE HIREDATE < '1998-01-01' AND (SAL > 5000 OR SAL < 1000);

* EMPNO int	* ENAME varchar(50)	* JOB varchar(50)	MGR int	HIREDATE date	SAL decimal(10,2)	COMM decimal(10,2)	DEPTNO int
Filter	Filter	Filter	Filter	Filter	Filter	Filter	Filter
3258	GREEN	SALESMAN	4422	1995-07-24	18500.00	2750.00	50
4422	STEVENS	MANAGER	7839	1994-01-14	24750.00	(NULL)	50
6548	BARNES	CLERK	4422	1995-01-16	11950.00	(NULL)	50
7499	ALLEN	SALESMAN	7698	1989-02-20	19000.00	6400.00	30
7500	CAMPBELL	ANALYST	7566	1992-10-30	24500.00	0.00	40
7521	WARD	SALESMAN	7698	1993-02-22	18500.00	4250.00	30
7566	JONES	MANAGER	7839	1989-04-02	26850.00	(NULL)	20
7654	MARTIN	SALESMAN	7698	1997-09-28	15675.00	3500.00	30

Figure 27: Result of Question 22

23. What is the command to add primary key constraint to EMPNO

ALTER TABLE EMP ADD CONSTRAINT EMP_PK PRIMARY KEY (EMPNO);

Figure 28: Result of Question 23

24. What is the command to add a new column EMP_family_name to existing EMP table

ALTER TABLE EMP ADD EMP_family_name VARCHAR(50);

COMM decimal(10,2)	DEPTNO int	EMP_family_name varchar(50)
Filter	Filter	Filter
2750.00	50	(NULL)
(NULL)	50	(NULL)
(NULL)	50	(NULL)

Figure 29: Result of Question 24

25. How to drop primary key constraint for EMPNO
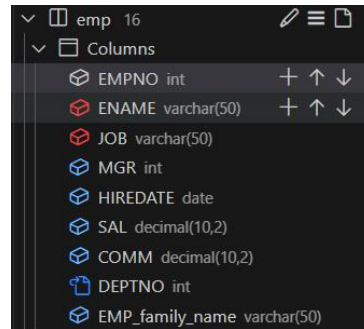
ALTER TABLE EMP DROP PRIAMRY KEY;

Figure 30: Result of Question 25

26. rename EMP table to EMPLOYEE
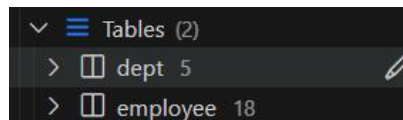
ALTER TABLE EMP RENAME TO EMPLOYEE;

Figure 31: Result of Question 26

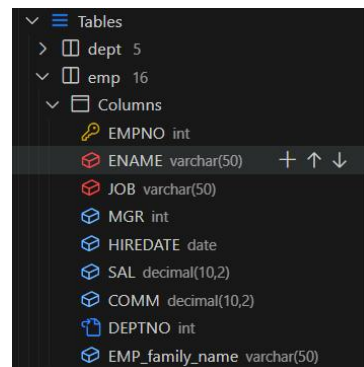27. rename EMPLOYEE   back to EMP

ALTER TABLE EMPLOYEE RENAME TO EMP;

Figure 32: Result of Question 27

28. What is the SQL command to remove column EMP_family_name from EMP table
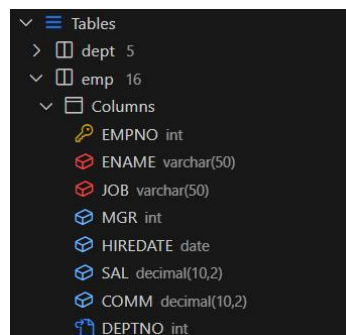
ALTER TABLE EMP DROP COLUMN EMP_family_name;

Figure 33: Result of Question 28

29. What is the SQL command to copy emp table to employee table
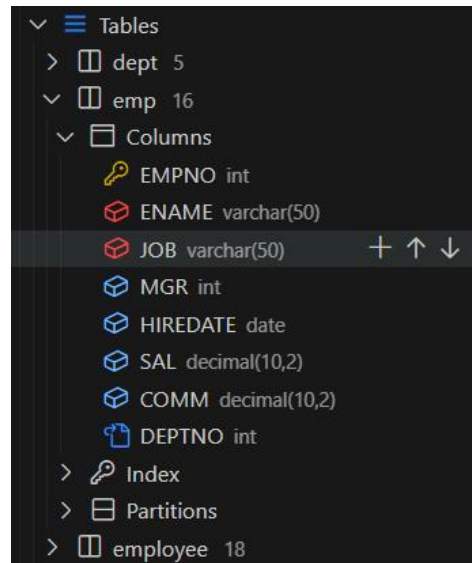   CREATE TABLE EMPLOYEE AS SELECT * FROM EMP;

Figure 34: Result of Question 29

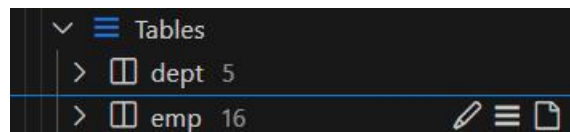30. What is the SQL command to drop employee table
    DROP TABLE EMPLOYEE;

Figure 35: Result of Question 30

31. What is the SQL command to find the employee whose commission is NULL
    SELECT * FROM EMP WHERE COMM IS NULL;

* EMPNO int	* ENAME varchar(50)	* JOB varchar(50)	MGR int	HIREDATE date	SAL decimal(10,2)	COMM decimal(10,2)	DEPTNO int
Filter	Filter	Filter	Filter	Filter	Filter	Filter	Filter
4422	STEVENS	MANAGER	7839	1994-01-14	24750.00	(NULL)	50
6548	BARNES	CLERK	4422	1995-01-16	11950.00	(NULL)	50
7369	SMITH	CLERK	7902	2009-12-17	13750.00	(NULL)	20
7566	JONES	MANAGER	7839	1989-04-02	26850.00	(NULL)	20
7698	BLAKE	MANAGER	7839	1990-05-01	24000.00	(NULL)	30
7782	CLARK	MANAGER	7839	1988-06-09	27500.00	(NULL)	10
7788	SCOTT	ANALYST	7566	1987-04-19	19500.00	(NULL)	20
7839	KING	PRESIDENT	(NULL)	1983-11-17	82500.00	(NULL)	10
7876	ADAMS	CLERK	7788	1996-05-23	11900.00	(NULL)	20
7900	JAMES	CLERK	7698	1995-12-03	12500.00	(NULL)	30
7902	FORD	ANALYST	7566	1991-12-03	21500.00	(NULL)	20

Figure 36: Result of Question 31

数据处理分析：(**Experiment process and content**)

In this experiment, the main task was to create and manage two tables: EMP and DEPT, and execute several SQL queries to retrieve specific information from these tables. The experiment demonstrated how SQL can be used effectively to create tables, insert data, and perform complex queries to retrieve specific information. The use of SQL constraints, such as primary keys and foreign keys, ensures data integrity within the database. Additionally, SQL's ability to filter, sort, and join data from different tables highlights its importance in managing and analyzing structured data.

深圳大学学生实验报告用纸

注：1、报告内的项目或内容设置，可根据实际情况加以调整和补充。
　　2、教师批改学生实验报告时间应在学生提交实验报告时间后 10 日内。