SOUMYADEEP SINHA
WEEK 1 - DAY 2 - 29-10-2024

MS SQL SERVER / MYSQL / INSTALLATION / CRUD

Difference in SQL, mySQL, SQL Server

1. SQL (Structured Query Language)

- **Definition**: A **standard language** used to interact with relational databases.
- **Purpose**: Allows users to perform **CRUD operations** (Create, Read, Update, Delete) and other queries.
- **Standardisation**: SQL is a language standard defined by ISO, so most relational databases use similar syntax for basic commands, though each database may extend it differently.

2. MySQL

- **Definition**: An **open-source relational database management system (RDBMS)** developed by Oracle Corporation, commonly used with web applications.
- **Compatibility**: Works well with web technologies like PHP and is often part of the **LAMP stack** (Linux, Apache, MySQL, PHP).
- **Key Features**:
    - **Cross-platform support**: Runs on Windows, Linux, and macOS.
    - **Storage Engines**: Supports multiple storage engines (e.g., InnoDB, MyISAM).
    - **Community and Enterprise Versions**: MySQL has both free (Community) and paid (Enterprise) versions, with Enterprise offering additional features.
- **Use Cases**: Web applications, content management systems (CMS), and small-to-medium businesses due to its ease of setup and performance.

3. SQL Server

- **Definition**: A **relational database management system (RDBMS)** developed by Microsoft, known for its integration with Windows and other Microsoft products.
- **Compatibility**: Works well with Windows Server and is often integrated with the **.NET framework**.
- **Key Features**:

    - **Comprehensive Security**: Advanced security features, including row-level security, transparent data encryption, and auditing.
    - **SSIS, SSAS, SSRS**: Comes with tools for data integration (SSIS), analysis (SSAS), and reporting (SSRS).
    - **Data Warehouse Support**: SQL Server includes features to support data warehousing and business intelligence.
- **Use Cases**: Enterprise applications, especially in Windows environments where advanced security, data integration, and analytical capabilities are needed.

SQL

SQL (Structured Query Language) is a standardised language used to interact with relational databases. It allows users to perform CRUD operations (Create, Read, Update, Delete) and complex data manipulations through queries. SQL is essential for managing and querying structured data.

Bulk Insert in SQL

Bulk Insert is a feature used to import large volumes of data into a database table from external files (like CSV or text files) quickly. Bulk inserts are efficient for data migration or loading data into a data warehouse, as they process large amounts of data in a single operation rather than multiple individual inserts.

```
BULK INSERT TableName
FROM 'file_path'
WITH (
    FIELDTERMINATOR = ',',
    ROWTERMINATOR = '\n',
    FIRSTROW = 2
);
```

MySQL

MySQL is an open-source relational database management system (RDBMS) widely used for web applications. Known for its ease of use and speed, MySQL supports SQL and is often employed in LAMP stacks (Linux, Apache, MySQL, PHP/Python/Perl).

Basic Queries (CRUD):

- Create: INSERT INTO table (column1, column2) VALUES (value1, value2);
- Read: SELECT * FROM table WHERE condition;

- Update: UPDATE table SET column1 = value1 WHERE condition;
- Delete: DELETE FROM table WHERE condition;

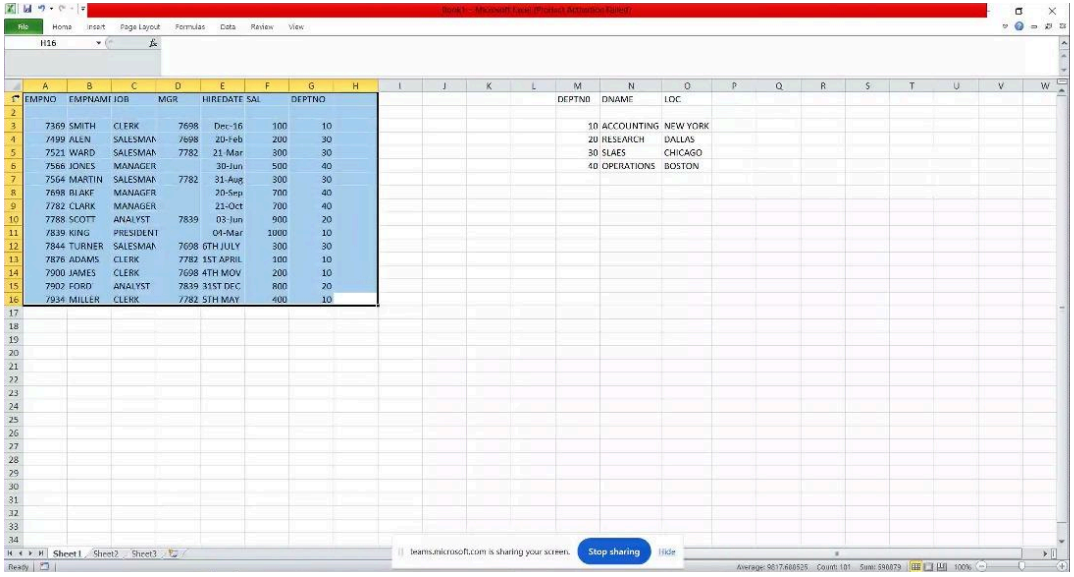
MS SQL (Microsoft SQL Server)

MS SQL Server is a relational database management system developed by Microsoft, often used in enterprise environments. It provides tools for advanced analytics, data integration, and business intelligence.

Basic Queries (CRUD):

- Create: INSERT INTO table (column1, column2) VALUES (value1, value2);
- Read: SELECT * FROM table WHERE condition;
- Update: UPDATE table SET column1 = value1 WHERE condition;
- Delete: DELETE FROM table WHERE condition;

CLASS TASK : CREATE A TABLE FOR EMPLOYEES BASED ON A EXCEL SHEET



EMPNO	EMPNAME	JOB	MGR	HIREDATE	SAL	DEPTNO
7369	SMITH	CLERK	7698	Dec-16	100	10
7499	ALEN	SALESMAN	7698	20-Feb	200	30
7521	WARD	SALESMAN	7782	21-Mar	300	30
7566	JONES	MANAGER		30-Jun	500	40
7564	MARTIN	SALESMAN	7782	31-Aug	300	30
7698	BLAKE	MANAGER		20-Sep	700	40
7782	CLARK	MANAGER		23-Oct	700	40
7788	SCOTT	ANALYST	7839	03-Jun	900	20
7839	KING	PRESIDENT		04-Mar	1000	10
7844	TURNER	SALESMAN	7698	6TH JULY	300	30
7876	ADAMS	CLERK	7782	1ST APRIL	100	10
7900	JAMES	CLERK	7698	4TH MOV	200	10
7902	FORD	ANALYST	7839	31ST DEC	800	20
7934	MILLER	CLERK	7782	5TH MAY	400	10

DEPTNO	DNAME	LOC
10	ACCOUNTING	NEW YORK
20	RESEARCH	DALLAS
30	SLAES	CHICAGO
40	OPERATIONS	BOSTON

```
CREATE TABLE Employee (
    Id INT AUTO_INCREMENT PRIMARY KEY,
    EMPNO INT UNIQUE,
    ENAME VARCHAR(50),
    JOB VARCHAR(50),
    MGR INT,
    HIREDATE DATE,
    SAL INT,
    DEPTNO INT
);

INSERT INTO Employee (EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, DEPTNO) VALUES
(7369, 'SMITH', 'CLERK', 7698, '2016-12-16', 100, 10),
(7499, 'ALLEN', 'SALESMAN', 7698, '2023-02-20', 200, 30),
(7521, 'WARD', 'SALESMAN', 7782, '2023-03-21', 300, 30),
(7566, 'JONES', 'MANAGER', NULL, '2023-06-30', 500, 40),
(7654, 'MARTIN', 'SALESMAN', 7782, '2023-08-31', 300, 30),
(7698, 'BLAKE', 'MANAGER', NULL, '2023-09-20', 700, 40),
(7782, 'CLARK', 'MANAGER', NULL, '2023-10-21', 700, 40),
(7788, 'SCOTT', 'ANALYST', 7839, '2023-06-03', 900, 20),
(7839, 'KING', 'PRESIDENT', NULL, '2023-03-04', 1000, 10),
(7844, 'TURNER', 'SALESMAN', 7698, '2023-07-06', 300, 30),
(7876, 'ADAMS', 'CLERK', 7782, '2023-04-01', 100, 10),
(7900, 'JAMES', 'CLERK', 7698, '2023-11-04', 200, 10),
(7902, 'FORD', 'ANALYST', 7839, '2023-12-31', 800, 20),
(7934, 'MILLER', 'CLERK', 7782, '2023-05-05', 400, 10);

SELECT * FROM Employee;

CREATE TABLE Department (
    Id INT AUTO_INCREMENT PRIMARY KEY,
    DEPTNO INT UNIQUE,
    DNAME VARCHAR(50),
    LOC VARCHAR(50)
);

INSERT INTO Department (DEPTNO, DNAME, LOC) VALUES
(10, 'ACCOUNTING', 'NEW YORK'),
(20, 'RESEARCH', 'DALLAS'),
(30, 'SALES', 'CHICAGO'),
(40, 'OPERATIONS', 'BOSTON');

select * from department;
```

SOME HANDS ON PRACTICE

- Some questions were provided for hands-on practice.
- Expected to run on both SQL SERVER and MySQL.

```
CREATE TABLE Department (
    Id INT IDENTITY(1,1) PRIMARY KEY,
    DEPTNO INT UNIQUE NOT NULL,
    DNAME VARCHAR(50),
    LOC VARCHAR(50)
);

INSERT INTO Department (DEPTNO, DNAME, LOC) VALUES
(10, 'ACCOUNTING', 'NEW YORK'),
(20, 'RESEARCH', 'DALLAS'),
(30, 'SALES', 'CHICAGO'),
(40, 'OPERATIONS', 'BOSTON');

--SELECT * FROM Department;

CREATE TABLE Employee (
    Id INT IDENTITY(1,1) PRIMARY KEY,
    EMPNO INT UNIQUE NOT NULL,
    ENAME VARCHAR(50),
    JOB VARCHAR(50),
    MGR INT,
    HIREDATE DATE,
    SAL INT,
    DEPTNO INT,
    constraint FK_Employee_Department FOREIGN KEY (DEPTNO) REFERENCES Department(DEPTNO)
);

INSERT INTO Employee (EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, DEPTNO) VALUES
(7369, 'SMITH', 'CLERK', 7698, '2016-12-16', 100, 10),
(7499, 'ALLEN', 'SALESMAN', 7698, '2023-02-20', 200, 30),
```

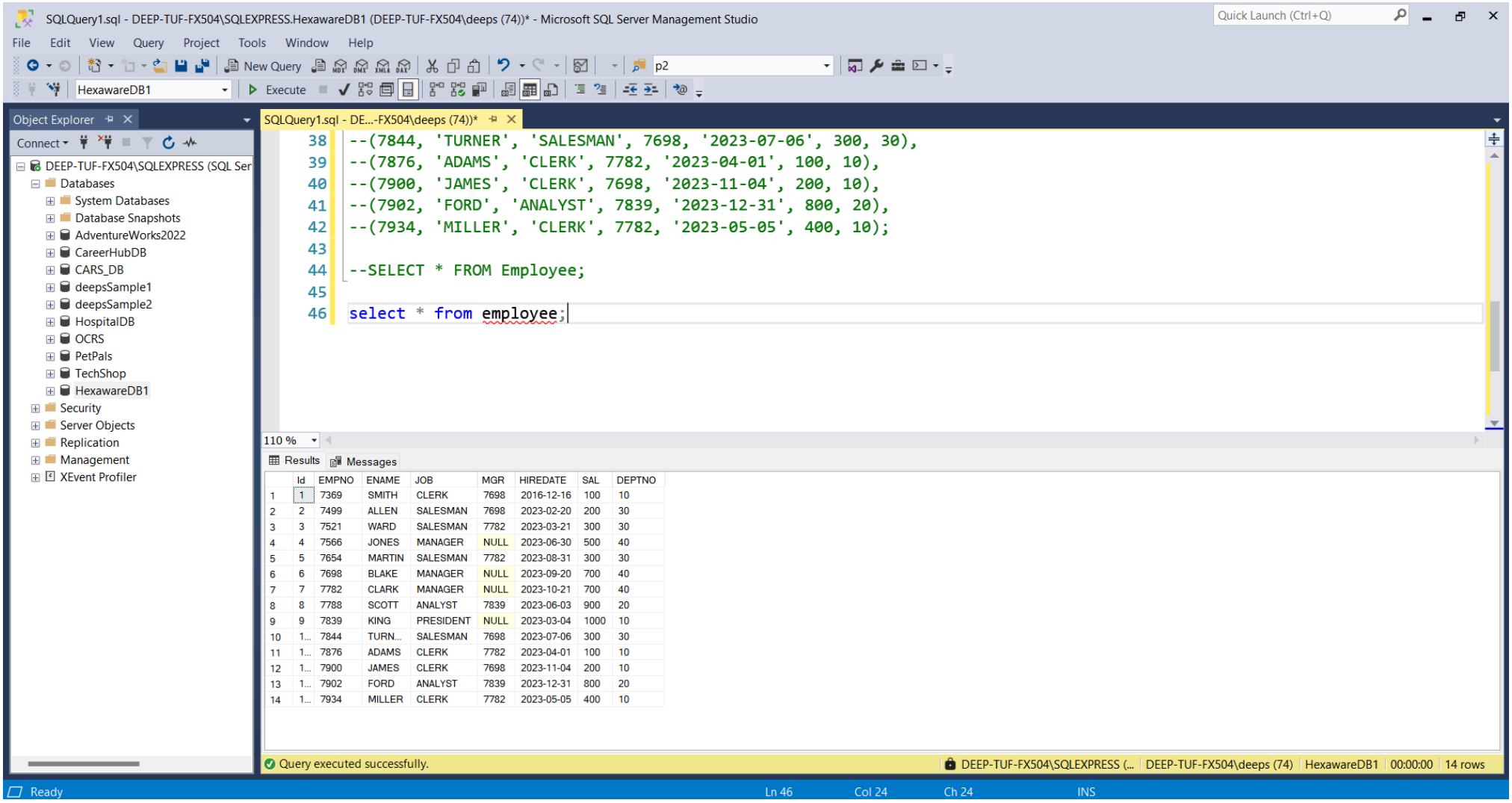
```
(7521, 'WARD', 'SALESMAN', 7782, '2023-03-21', 300, 30),
(7566, 'JONES', 'MANAGER', NULL, '2023-06-30', 500, 40),
(7654, 'MARTIN', 'SALESMAN', 7782, '2023-08-31', 300, 30),
(7698, 'BLAKE', 'MANAGER', NULL, '2023-09-20', 700, 40),
(7782, 'CLARK', 'MANAGER', NULL, '2023-10-21', 700, 40),
(7788, 'SCOTT', 'ANALYST', 7839, '2023-06-03', 900, 20),
(7839, 'KING', 'PRESIDENT', NULL, '2023-03-04', 1000, 10),
(7844, 'TURNER', 'SALESMAN', 7698, '2023-07-06', 300, 30),
(7876, 'ADAMS', 'CLERK', 7782, '2023-04-01', 100, 10),
(7900, 'JAMES', 'CLERK', 7698, '2023-11-04', 200, 10),
(7902, 'FORD', 'ANALYST', 7839, '2023-12-31', 800, 20),
(7934, 'MILLER', 'CLERK', 7782, '2023-05-05', 400, 10);

--SELECT * FROM Employee;
```

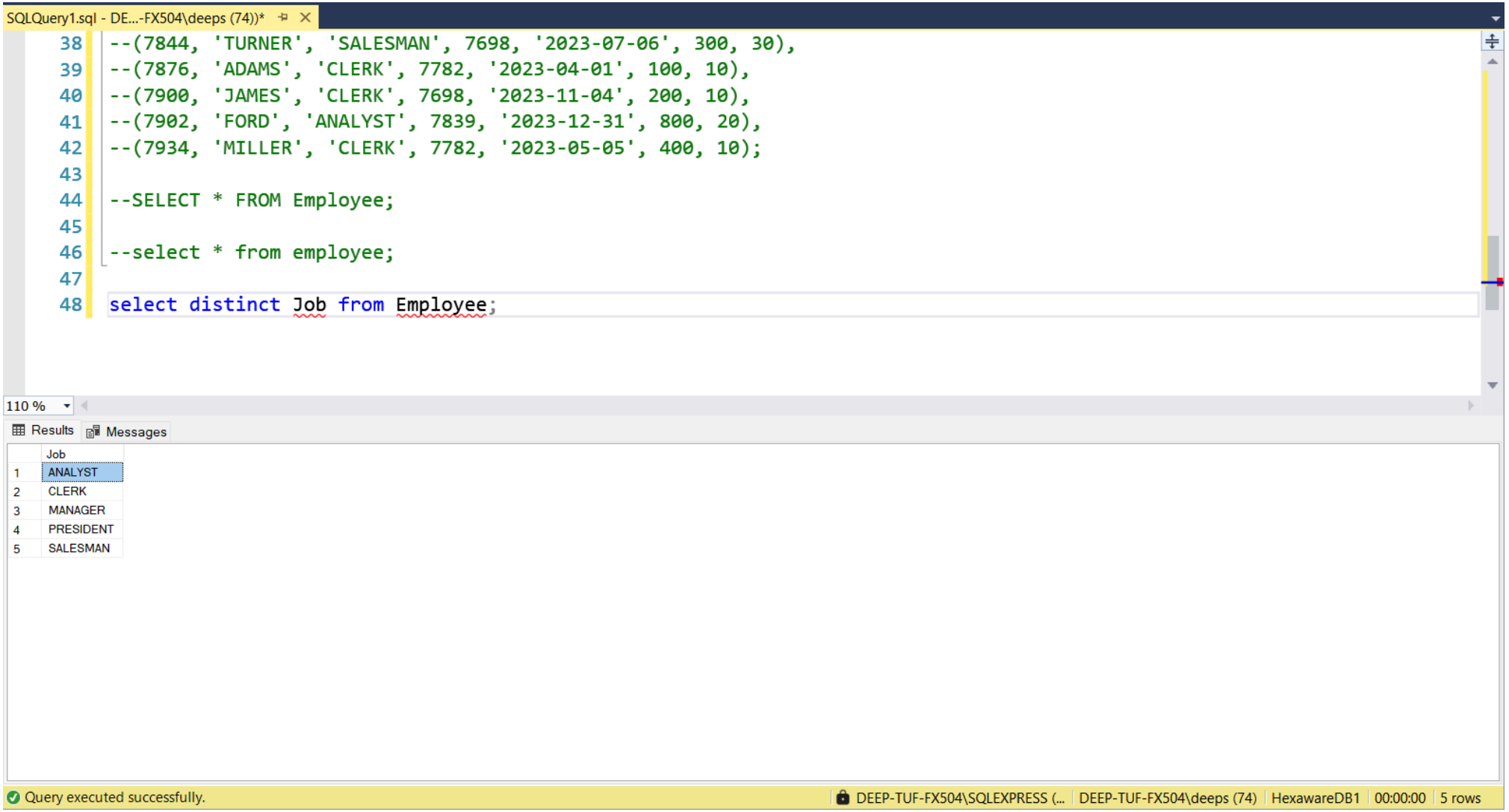
TASKS

- Storing Data in a Table
- Updating Data in a Table
- Deleting Data from a Table
- Retrieving Specific Attributes
- Retrieving Selected Rows
- Filtering Data:WHERE Clauses
- Filtering Data:IN,DISTINCT,AND,OR,IN,BETWEEN,LIKE,Column & table aliases

Display all the information of the EMP table?



Display unique Jobs from EMP table?



List the emps in the asc order of their Salaries?

SQLQuery1.sql - DE...-FX504\deeps (74))*

```
41  --(7902, 'FORD', 'ANALYST', 7839, '2023-12-31', 800, 20),
42  --(7934, 'MILLER', 'CLERK', 7782, '2023-05-05', 400, 10);
43
44  --SELECT * FROM Employee;
45
46  --select * from employee;
47
48  --select distinct Job from Employee;
49
50  select * from employee order by sal asc
```

110 %

Results | Messages

	Id	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	DEPTNO
1	1	7369	SMITH	CLERK	7698	2016-12-16	100	10
2	11	7876	ADAMS	CLERK	7782	2023-04-01	100	10
3	12	7900	JAMES	CLERK	7698	2023-11-04	200	10
4	2	7499	ALLEN	SALESMAN	7698	2023-02-20	200	30
5	3	7521	WARD	SALESMAN	7782	2023-03-21	300	30
6	5	7654	MARTIN	SALESMAN	7782	2023-08-31	300	30
7	10	7844	TURNER	SALESMAN	7698	2023-07-06	300	30
8	14	7934	MILLER	CLERK	7782	2023-05-05	400	10
9	4	7566	JONES	MANAGER	NULL	2023-06-30	500	40
10	6	7698	BLAKE	MANAGER	NULL	2023-09-20	700	40
11	7	7782	CLARK	MANAGER	NULL	2023-10-21	700	40
12	13	7902	FORD	ANALYST	7839	2023-12-31	800	20
13	8	7788	SCOTT	ANALYST	7839	2023-06-03	900	20
14	9	7839	KING	PRESIDENT	NULL	2023-03-04	1000	10

Query executed successfully. | DEEP-TUF-FX504\SQLEXPRESS (... | DEEP-TUF-FX504\deeps (74) | HexawareDB1 | 00:00:00 | 14 rows

List the details of the emps in asc order of the Dptnos and desc of Jobs?

SQLQuery1.sql - DE...-FX504\deeps (74))*

```
41  --(7902, 'FORD', 'ANALYST', 7839, '2023-12-31', 800, 20),
42  --(7934, 'MILLER', 'CLERK', 7782, '2023-05-05', 400, 10);
43
44  --SELECT * FROM Employee;
45
46  --select * from employee;
47
48  --select distinct Job from Employee;
49
50  --select * from employee order by sal asc
51
52  select * from employee order by deptno asc, job desc;
```

110 %

Results | Messages

	Id	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	DEPTNO
1	9	7839	KING	PRESIDENT	NULL	2023-03-04	1000	10
2	1	7369	SMITH	CLERK	7698	2016-12-16	100	10
3	11	7876	ADAMS	CLERK	7782	2023-04-01	100	10
4	12	7900	JAMES	CLERK	7698	2023-11-04	200	10
5	14	7934	MILLER	CLERK	7782	2023-05-05	400	10
6	8	7788	SCOTT	ANALYST	7839	2023-06-03	900	20
7	13	7902	FORD	ANALYST	7839	2023-12-31	800	20
8	2	7499	ALLEN	SALESMAN	7698	2023-02-20	200	30
9	3	7521	WARD	SALESMAN	7782	2023-03-21	300	30
10	10	7844	TURNER	SALESMAN	7698	2023-07-06	300	30
11	5	7654	MARTIN	SALESMAN	7782	2023-08-31	300	30
12	6	7698	BLAKE	MANAGER	NULL	2023-09-20	700	40
13	7	7782	CLARK	MANAGER	NULL	2023-10-21	700	40
14	4	7566	JONES	MANAGER	NULL	2023-06-30	500	40

Query executed successfully. | DEEP-TUF-FX504\SQLEXPRESS (... | DEEP-TUF-FX504\deeps (74) | HexawareDB1 | 00:00:00 | 14 rows

Display all the details of all ‘Mgrs’

SQLQuery1.sql - DE...-FX504\deeps (74))*

```
44  --SELECT * FROM Employee;
45
46  --select * from employee;
47
48  --select distinct Job from Employee;
49
50  --select * from employee order by sal asc
51
52  --select * from employee order by deptno asc, job desc;
53
54  select * from Employee where Job = 'MANAGER';
```

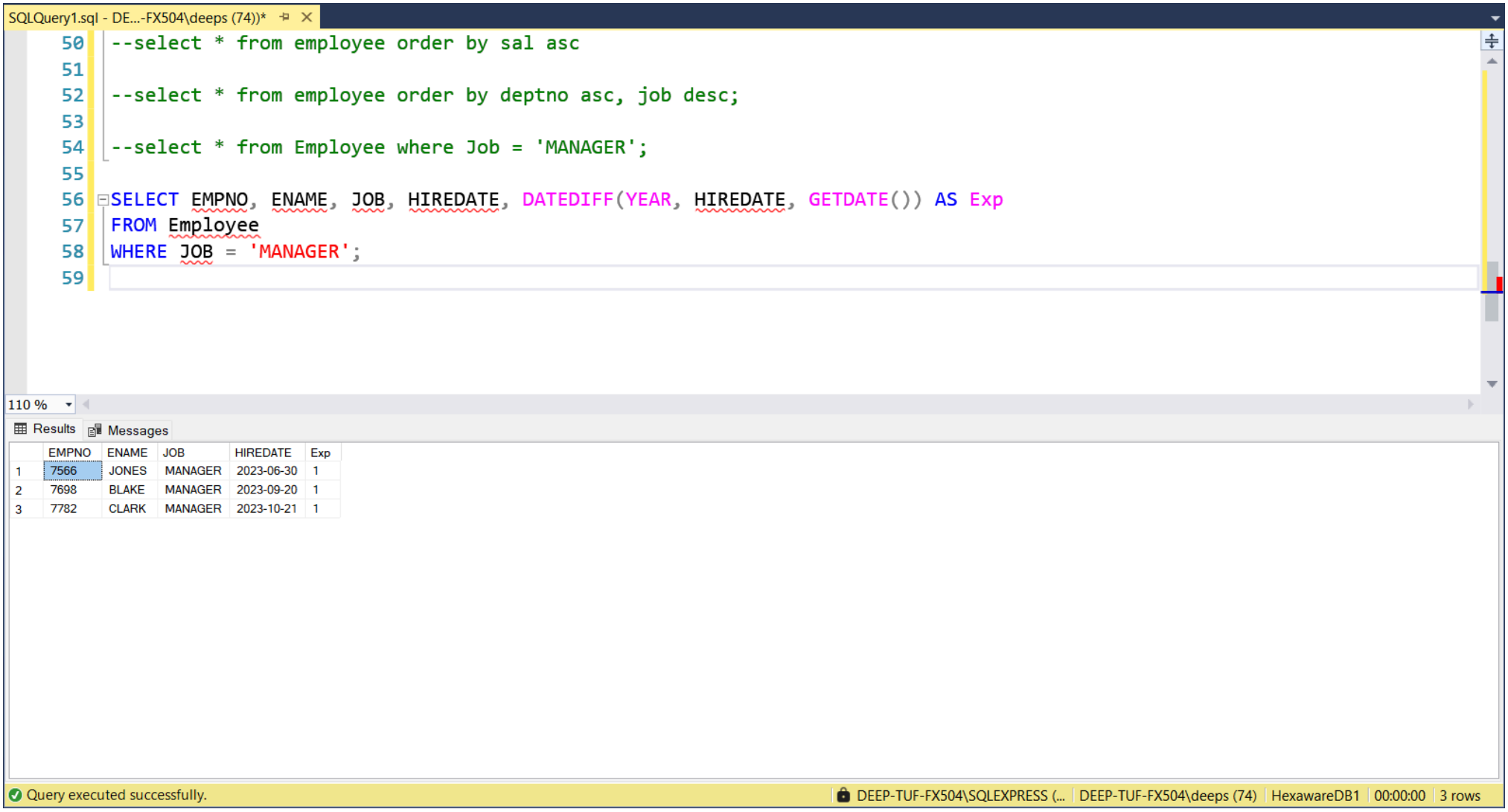
110 %

Results | Messages

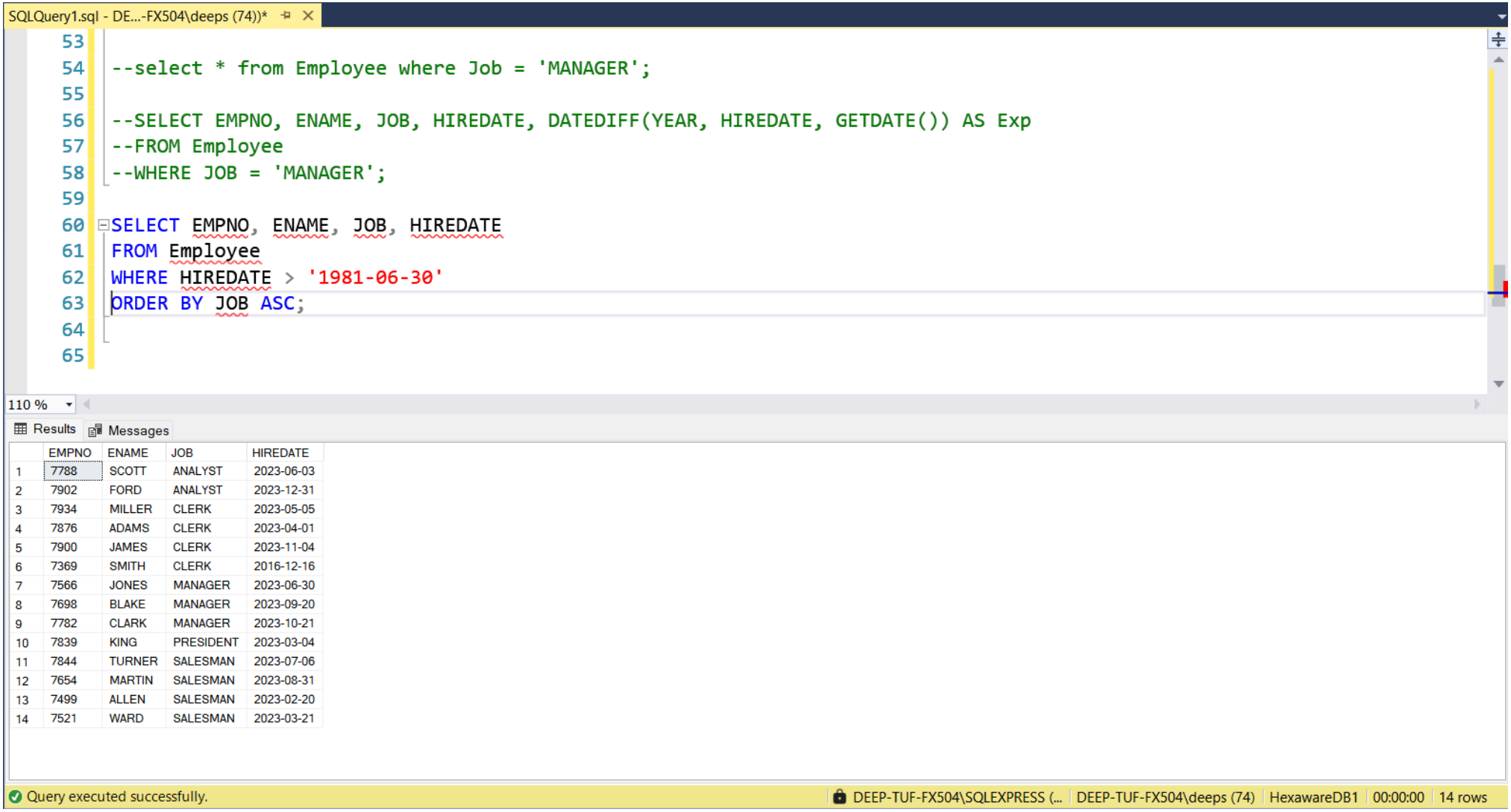
	Id	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	DEPTNO
1	4	7566	JONES	MANAGER	NULL	2023-06-30	500	40
2	6	7698	BLAKE	MANAGER	NULL	2023-09-20	700	40
3	7	7782	CLARK	MANAGER	NULL	2023-10-21	700	40

Query executed successfully. | DEEP-TUF-FX504\SQLEXPRESS (... | DEEP-TUF-FX504\deeps (74) | HexawareDB1 | 00:00:00 | 3 rows

Display the Empno, Ename, job, Hiredate, Exp of all Mgrs



List the emps in the asc order of Designations of those joined after the second half of 1981.



List the emps who are either ‘CLERK’ or ‘ANALYST’ in the Desc order.

SQLQuery1.sql - DE...-FX504\deeps (74))*

```
56  --SELECT EMPNO, ENAME, JOB, HIREDATE, DATEDIFF(YEAR, HIREDATE, GETDATE()) AS Exp
57  --FROM Employee
58  --WHERE JOB = 'MANAGER';
59
60  --SELECT EMPNO, ENAME, JOB, HIREDATE
61  --FROM Employee
62  --WHERE HIREDATE > '1981-06-30'
63  --ORDER BY JOB ASC;
64
65  SELECT EMPNO, ENAME, JOB, HIREDATE
66  FROM Employee
67  WHERE JOB IN ('CLERK', 'ANALYST')
68  ORDER BY JOB DESC;
69
```

110 %

Results | Messages

	EMPNO	ENAME	JOB	HIREDATE
1	7369	SMITH	CLERK	2016-12-16
2	7876	ADAMS	CLERK	2023-04-01
3	7900	JAMES	CLERK	2023-11-04
4	7934	MILLER	CLERK	2023-05-05
5	7902	FORD	ANALYST	2023-12-31
6	7788	SCOTT	ANALYST	2023-06-03

Query executed successfully. | DEEP-TUF-FX504\SQLEXPRESS (... | DEEP-TUF-FX504\deeps (74) | HexawareDB1 | 00:00:00 | 6 rows

List the emp who are working for the Deptno 10 or 20.

SQLQuery1.sql - DE...-FX504\deeps (74))*

```
66  --FROM Employee
67  --WHERE JOB IN ('CLERK', 'ANALYST')
68  --ORDER BY JOB DESC;
69
70  SELECT EMPNO, ENAME, JOB, DEPTNO FROM Employee WHERE DEPTNO = 10 OR DEPTNO = 20;
71
```

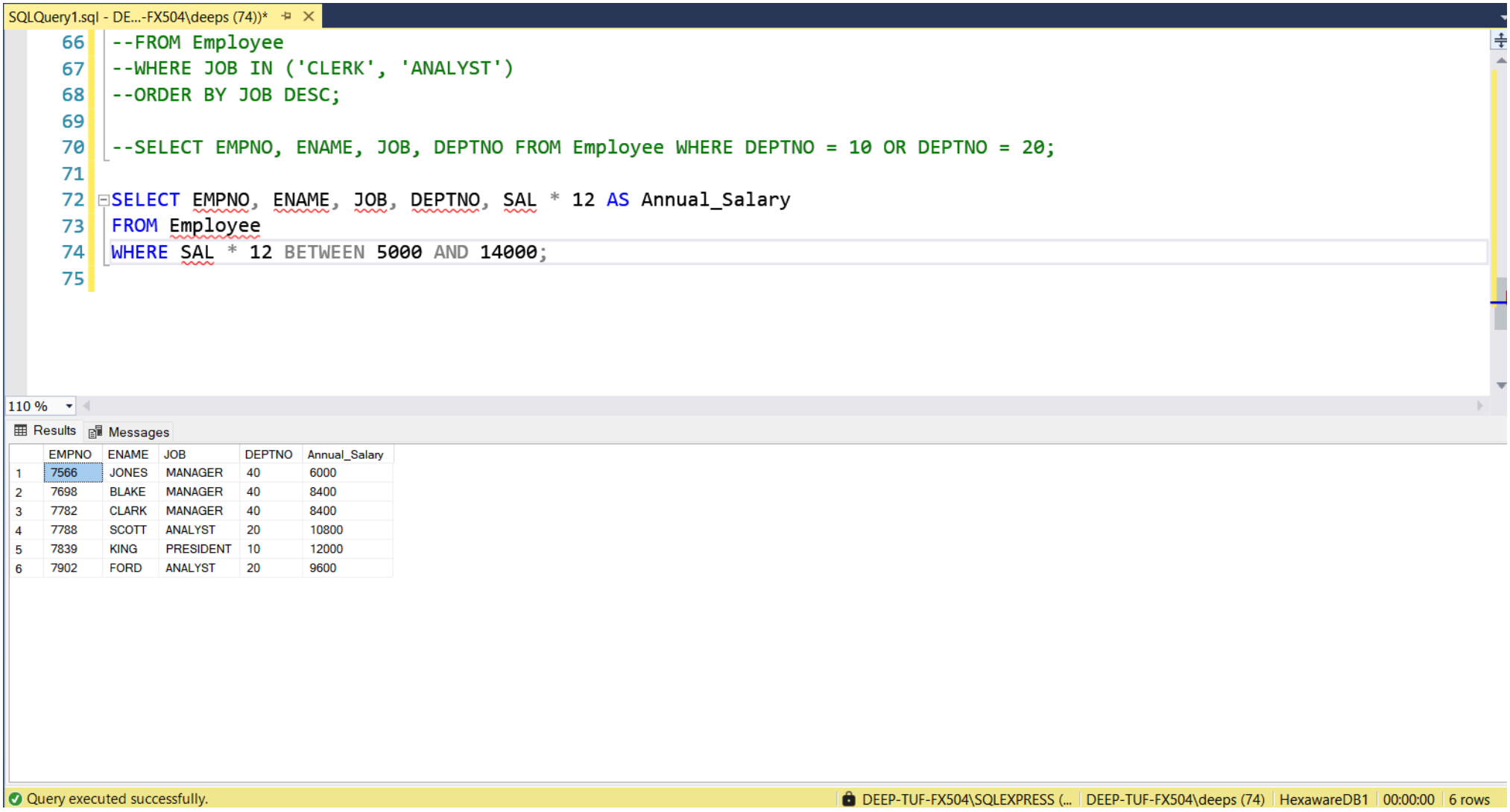
110 %

Results | Messages

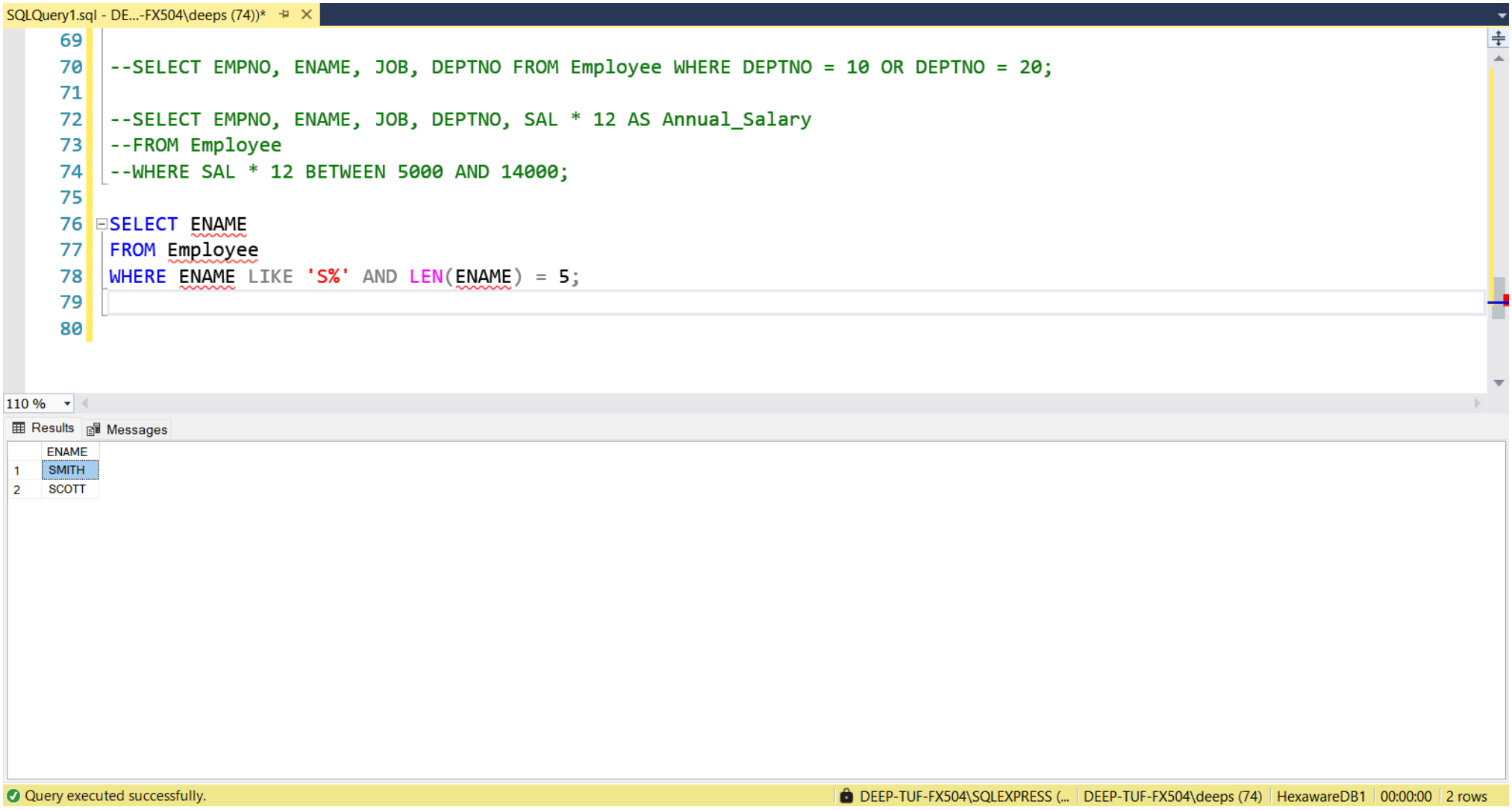
	EMPNO	ENAME	JOB	DEPTNO
1	7369	SMITH	CLERK	10
2	7788	SCOTT	ANALYST	20
3	7839	KING	PRESIDENT	10
4	7876	ADAMS	CLERK	10
5	7900	JAMES	CLERK	10
6	7902	FORD	ANALYST	20
7	7934	MILLER	CLERK	10

Query executed successfully. | DEEP-TUF-FX504\SQLEXPRESS (... | DEEP-TUF-FX504\deeps (74) | HexawareDB1 | 00:00:00 | 7 rows

List the emps Who Annual sal ranging from 5000 and 14000.



List the Enames those are starting with ‘S’ and with five characters.



List the total information of EMP table along with DNAME and Loc of all the emps Working Under ‘ACCOUNTING’ & ‘RESEARCH’ in the asc Deptno.

SQLQuery1.sql - DE...-FX504\deeps (74))*

```
72  --SELECT EMPNO, ENAME, JOB, DEPTNO, SAL * 12 AS Annual_Salary
73  --FROM Employee
74  --WHERE SAL * 12 BETWEEN 5000 AND 14000;
75
76  --SELECT ENAME
77  --FROM Employee
78  --WHERE ENAME LIKE 'S%' AND LEN(ENAME) = 5;
79
80  SELECT e.*, d.DNAME, d.LOC
81  FROM Employee e
82  JOIN Department d ON e.DEPTNO = d.DEPTNO
83  WHERE d.DNAME IN ('ACCOUNTING', 'RESEARCH')
84  ORDER BY e.DEPTNO ASC;
85
```

110 %

Results | Messages

	Id	EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	DEPTNO	DNAME	LOC
1	9	7839	KING	PRESIDENT	NULL	2023-03-04	1000	10	ACCOUNTING	NEW YORK
2	11	7876	ADAMS	CLERK	7782	2023-04-01	100	10	ACCOUNTING	NEW YORK
3	12	7900	JAMES	CLERK	7698	2023-11-04	200	10	ACCOUNTING	NEW YORK
4	1	7369	SMITH	CLERK	7698	2016-12-16	100	10	ACCOUNTING	NEW YORK
5	14	7934	MILLER	CLERK	7782	2023-05-05	400	10	ACCOUNTING	NEW YORK
6	8	7788	SCOTT	ANALYST	7839	2023-06-03	900	20	RESEARCH	DALLAS
7	13	7902	FORD	ANALYST	7839	2023-12-31	800	20	RESEARCH	DALLAS

Query executed successfully. | DEEP-TUF-FX504\SQLEXPRESS (... | DEEP-TUF-FX504\deeps (74) | HexawareDB1 | 00:00:00 | 7 rows