backend-plus-04

Task.01 认识数据库

1. 什么是数据库？什么是DBMS？

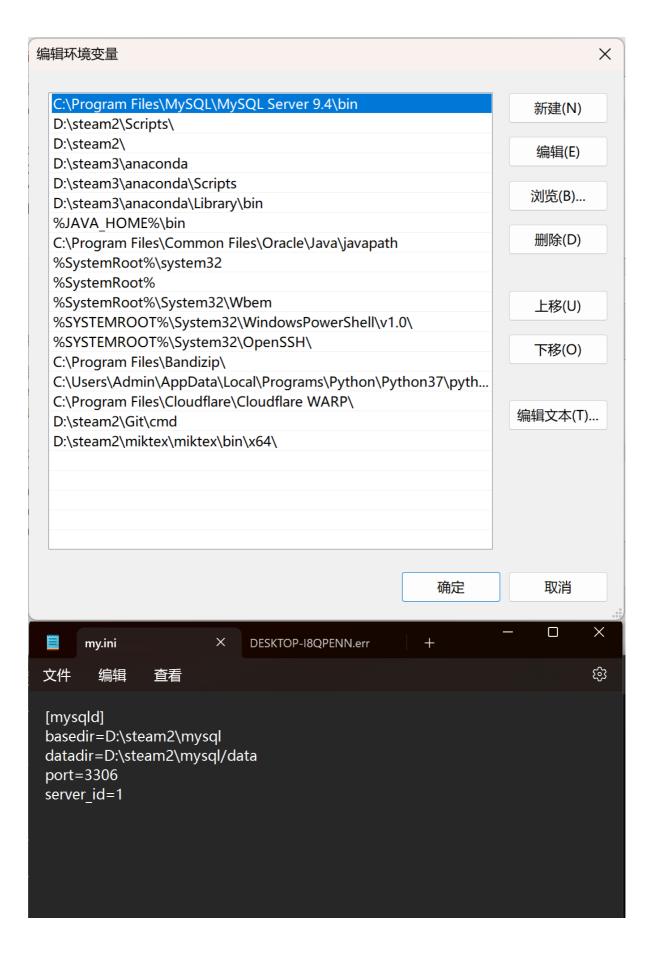   数据库是长期存储在计算机内、有组织的、可共享的数据集合。DBMS（数据库管理系统）是用于管理数据库的软件，负责数据的存储、查询、更新和安全控制。

2. 你知道常见的DBMS有哪些吗？

   常见的DBMS有：MySQL、Oracle、SQL Server、PostgreSQL、SQLite等。

3. 什么是主键？什么是外键？他们的作用是什么？

   主键是唯一标识表中每条记录的字段，确保数据唯一性；外键是另一个表的主键，用于建立表之间的关联，保证数据一致性。

Task.02 安装MySQL：**下载并安装——配置环境变量——配置 my.ini 文件——初始化数据库——启动 MySQL 服务——登录 MySQL**

编辑环境变量

C:\Program Files\MySQL\MySQL Server 9.4\bin
D:\steam2\Scripts\
D:\steam2\
D:\steam3\anaconda
D:\steam3\anaconda\Scripts
D:\steam3\anaconda\Library\bin
%JAVA_HOME%\bin
C:\Program Files\Common Files\Oracle\Java\javapath
%SystemRoot%\system32
%SystemRoot%
%SystemRoot%\System32\Wbem
%SYSTEMROOT%\System32\WindowsPowerShell\v1.0\
%SYSTEMROOT%\System32\OpenSSH\
C:\Program Files\Bandizip\
C:\Users\Admin\AppData\Local\Programs\Python\Python37\pyth...
C:\Program Files\Cloudflare\Cloudflare WARP\
D:\steam2\Git\cmd
D:\steam2\miktex\miktex\bin\x64\

新建(N)

编辑(E)

浏览(B)...

删除(D)

上移(U)

下移(O)

编辑文本(T)...

确定　　取消

my.ini　　✕　　DESKTOP-I8QPENN.err　　+

文件　编辑　查看

[mysqld]
basedir=D:\steam2\mysql
datadir=D:\steam2\mysql/data
port=3306
server_id=1

Task.03 入门的SQL语句：创建数据库——创建学生表——插入四条数据——查询数据

```
mysql> CREATE DATABASE IF NOT EXISTS school;
Query OK, 1 row affected (0.299 sec)

mysql> USE school;
Database changed
mysql> CREATE TABLE student (
    ->     id INT AUTO_INCREMENT PRIMARY KEY,
    ->     name VARCHAR(50) NOT NULL,
    ->     age INT,
    ->     gender INT COMMENT '1:男，2:女 '
    -> );
Query OK, 0 rows affected (0.387 sec)

mysql> INSERT INTO student (name, age, gender) VALUES
    -> ('张三', 19, 1),
    -> ('李四', 18, 2),
    -> ('张五', 22, 2),
    -> ('赵六', 21, 1);
Query OK, 4 rows affected (0.118 sec)
Records: 4  Duplicates: 0  Warnings: 0

mysql> SELECT name, gender FROM student;
+--------+--------+
| name   | gender |
+--------+--------+
| 张三   |      1 |
| 李四   |      2 |
| 张五   |      2 |
| 赵六   |      1 |
+--------+--------+
4 rows in set (0.007 sec)

mysql> SELECT name, age FROM student WHERE age > 20;
+--------+------+
| name   | age  |
+--------+------+
| 张五   |   22 |
| 赵六   |   21 |
+--------+------+
2 rows in set (0.007 sec)

mysql> SELECT * FROM student WHERE name LIKE '张%';
+----+--------+------+--------+
| id | name   | age  | gender |
+----+--------+------+--------+
|  1 | 张三   |   19 |      1 |
|  3 | 张五   |   22 |      2 |
+----+--------+------+--------+
2 rows in set (0.007 sec)
```

Task.04 进阶SQL：创建成绩表 `grade` ——插入成绩数据——完成三个查询任务

```
mysql> CREATE TABLE grade (
    ->     id INT AUTO_INCREMENT PRIMARY KEY,
    ->     student_id INT NOT NULL,
    ->     subject VARCHAR(20) NOT NULL,
    ->     score INT,
    ->     FOREIGN KEY (student_id) REFERENCES student(id)
    -> );
Query OK, 0 rows affected (0.348 sec)

mysql> INSERT INTO grade (student_id, subject, score) VALUES
    -> (1, '语文', 98),
    -> (1, '数学', 89),
    -> (1, '英语', 88),
    -> (2, '语文', 99),
    -> (2, '数学', 90),
    -> (2, '英语', 97),
    -> (3, '语文', 65),
    -> (3, '数学', 74),
    -> (3, '英语', 89),
    -> (4, '语文', 68),
    -> (4, '数学', 96),
    -> (4, '英语', 60);
Query OK, 12 rows affected (0.059 sec)
Records: 12  Duplicates: 0  Warnings: 0

mysql> SELECT s.id, s.name, g.score
    -> FROM student s
    -> JOIN grade g ON s.id = g.student_id
    -> WHERE g.subject = '数学' AND g.score > 80;
+----+--------+-------+
| id | name   | score |
+----+--------+-------+
|  1 | 张三   |    89 |
|  2 | 李四   |    90 |
|  4 | 赵六   |    96 |
+----+--------+-------+
3 rows in set (0.014 sec)
```

```
mysql> SELECT s.id, s.name, SUM(g.score) AS total_score
    -> FROM student s
    -> JOIN grade g ON s.id = g.student_id
    -> GROUP BY s.id, s.name;
+----+--------+-------------+
| id | name   | total_score |
+----+--------+-------------+
|  1 | 张三   |         275 |
|  2 | 李四   |         286 |
|  3 | 张五   |         228 |
|  4 | 赵六   |         224 |
+----+--------+-------------+
4 rows in set (0.048 sec)

mysql> SELECT s.id, s.name, g.score
    -> FROM student s
    -> JOIN grade g ON s.id = g.student_id
    -> WHERE g.subject = '数学'
    ->   AND g.score > (
    ->     SELECT AVG(score)
    ->     FROM grade
    ->     WHERE subject = '数学'
    ->   );
+----+--------+-------+
| id | name   | score |
+----+--------+-------+
|  1 | 张三   |    89 |
|  2 | 李四   |    90 |
|  4 | 赵六   |    96 |
+----+--------+-------+
3 rows in set (0.008 sec)

mysql>
```