Mysql基础

MySQL 是关系型数据库管理系统的一种实现，它实现了关系型数据库的基本概念和功能。MySQL 使用表格来表示数据，并通过 SQL 进行数据管理。

1. Sql语句的分类

DDL(Data Defination Language)

数据定义语言，用来定义数据库对象 **(数据库，表，字段)**

示例

```
-- 创建表
CREATE TABLE Employees (
    EmployeeID INT PRIMARY KEY,
    FirstName VARCHAR(50),
    LastName VARCHAR(50),
    BirthDate DATE,
    Position VARCHAR(50)
);

-- 修改表
ALTER TABLE Employees ADD Email VARCHAR(100);

-- 删除表
DROP TABLE Employees;

-- 清空表
TRUNCATE TABLE Employees;
```

DML(Data Manipulation Language)

数据操作语言，用来对数据库表中的数据进行**增(INSERT),改(UPDATE),删(DELETE)**

示例

```
-- 插入数据
INSERT INTO Employees (EmployeeID, FirstName, LastName, BirthDate, Position)
VALUES (1, 'John', 'Doe', '1980-01-01', 'Manager');

-- 更新数据
UPDATE Employees SET Position = 'Senior Manager' WHERE EmployeeID = 1;

-- 删除数据
DELETE FROM Employees WHERE EmployeeID = 1;
```

DQL(Data Query Language)

数据查询语言，用来查询数据库中的**记录**

示例

```
SELECT column1, column2 FROM table_name WHERE condition;
```

DCL(Data Control Language)

数据控制语言，用来创建数据库用户，控制数据库的访问权限

示例

```
-- 授予权限
GRANT SELECT, INSERT ON Employees TO user1;

-- 撤销权限
REVOKE INSERT ON Employees FROM user1;
```

2. DDL操作详解

控制字段

2.1 CREATE

创建数据库

```
CREATE DATABASE my_database;
```

创建表

```
CREATE TABLE users (
    id INT AUTO_INCREMENT PRIMARY KEY,
    name VARCHAR(100) NOT NULL,
    email VARCHAR(100) UNIQUE NOT NULL,
    created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP
);
```

2.2 ALTER

添加字段

```
alter table test add column age int;
```

修改字段的数据类型

```
alter table test modify column name varchar(50);
```

重命名列

```
alter table test change column age Age int;
```

重命名表

```
alter table test rename to student;
```

删除列

```
alter table test drop column age;
```

2.3 DROP

删除数据库

```
drop database db01;
```

删除表

```
drop table student;
```

3. DML操作详解

控制记录

3.1 Insert

插入记录

```
insert into student (id,name) values (1,'bairui');
```

插入多条数据

```
insert into student (id,name) values
(2,'bai'),
(3,'rui')
```

3.2 Update

更新单条记录

```
update student set name='br' where id =1;
```

更新多条记录

```
update student set name='br' where age=12;//将12岁的都改成br
```

3.3 Delete

删除某条数据

```
delete from student where id =1;
```

删除所有数据

```
delete from user;
```

4. DQL操作详解

Sql查询语句的运行顺序
在 SQL 中，查询的执行顺序与我们书写的顺序不同。SQL 引擎通常按照以下步骤执行查询：

```
FROM 子句：确定参与查询的表或视图，并进行必要的连接。
JOIN 操作：执行连接操作，生成一个中间结果集。
WHERE 子句：应用过滤条件，筛选出符合条件的行。
GROUP BY 子句：按指定的列分组。
HAVING 子句：对分组后的结果进行过滤（如果存在）。
SELECT 子句：选择需要返回的列，并计算聚合函数。
ORDER BY 子句：排序结果集（如果存在）。
LIMIT 子句：限制返回的行数（如果存在）。
DQL语句通过**select**在表中查询对应条件的字段
通过限制条件来控制查询记录
```

SELECT 语句的基本语法

```
SELECT [DISTINCT] column1, column2, ...
FROM table_name
[WHERE condition]
[GROUP BY column1, column2, ...]
[HAVING condition]
[ORDER BY column1 [ASC|DESC], column2 [ASC|DESC], ...]
[LIMIT number];
```

4.1 基本查询

查询表中所有字段，并给出相应的记录

```
select * from student;
```

查询表中某些字段，并给出相应的记录

```
select age from student;
```

4.2 条件查询

4.2.1 单表操作

根据条件筛出某些记录-Where

```
select * from student where age>20;
```

消除字段中的重复记录-distinct

```
select distinct age from student;
```

将字段的记录按排序-order by

```
select distinct name,age from student order by age asc;//正序
select distinct name,age from student order by age desc;//逆序
```

分组-group by

通常要和聚合函数一起组合使用

```
select age,count(*) from student group by age;
```

筛选分组后的记录-Having

```
select age,count(*)
from student
group by age
having count(*)>1;
```

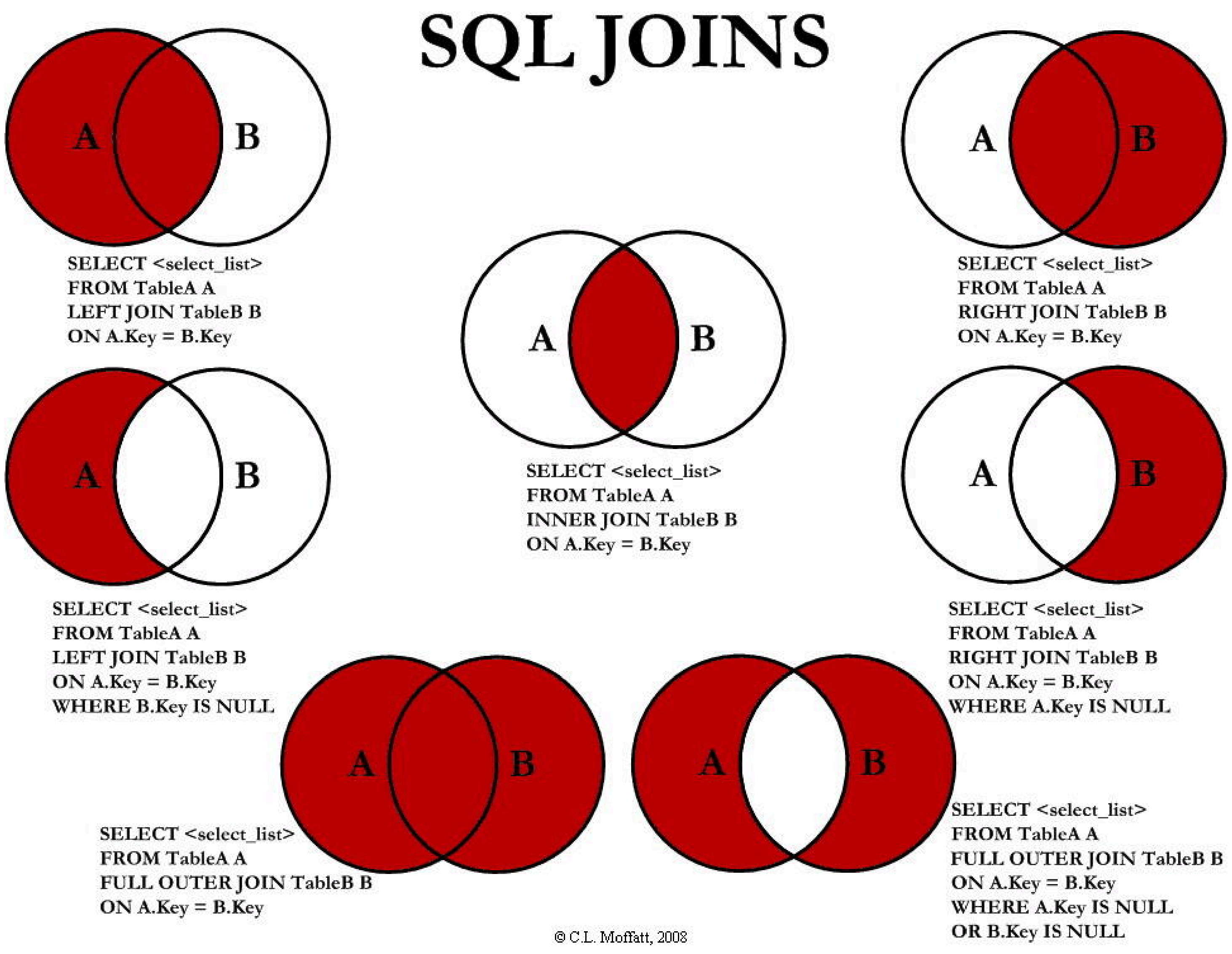
限制返回的记录数

```
select age,count(*)
from student
group by age
limit 2;
```

4.2.2 多表操作

SQL join 用于把来自两个或多个表的行结合起来。

下图展示了 LEFT JOIN、RIGHT JOIN、INNER JOIN、OUTER JOIN 相关的 7 种用法。

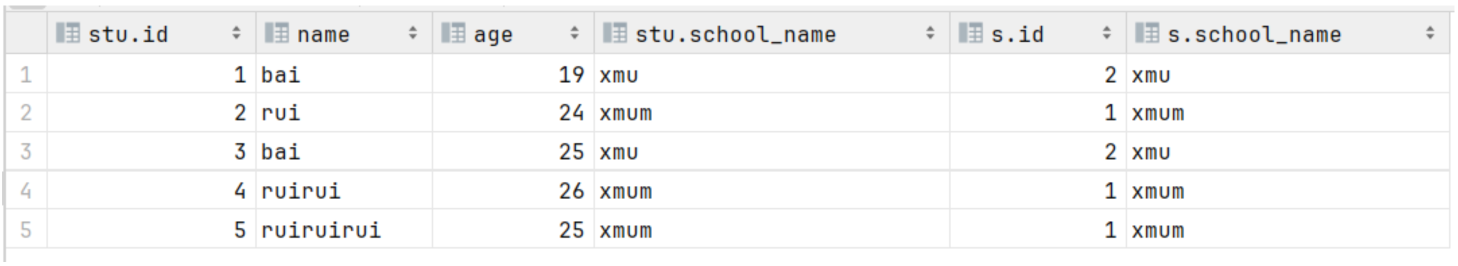


Join

最普通的多表连接，根据条件返回两张表中有连接的记录

```
select stu.name,stu.school_name
from student stu
join school s
on stu.school_name=s.school_name;

select *
from student stu
inner join school s //inner join 与join的结果相同
on stu.school_name=s.school_name;
```

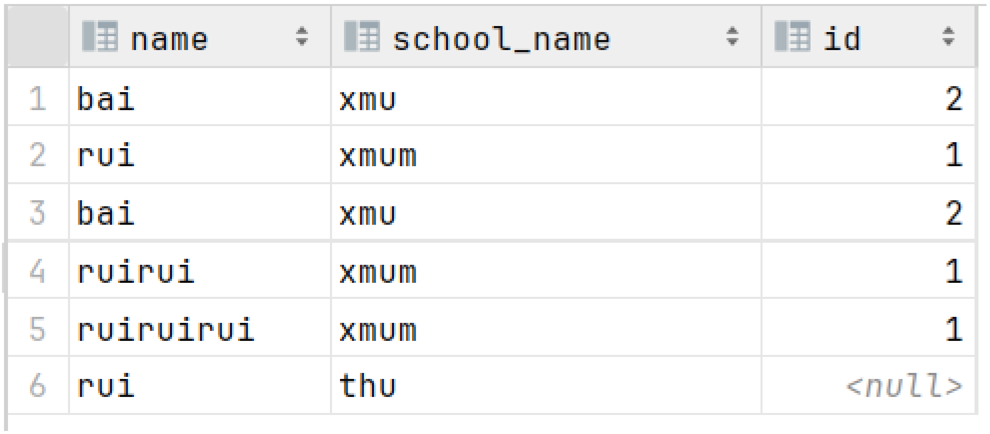


	stu.id	name	age	stu.school_name	s.id	s.school_name
1	1	bai	19	xmu	2	xmu
2	2	rui	24	xmum	1	xmum
3	3	bai	25	xmu	2	xmu
4	4	ruirui	26	xmum	1	xmum
5	5	ruiruirui	25	xmum	1	xmum

left join

返回左表中的所有记录，即使右表中没有相应的记录(会返回null)

```
select stu.name,stu.school_name
from student stu
left join school s
on stu.school_name=s.school_name;
```

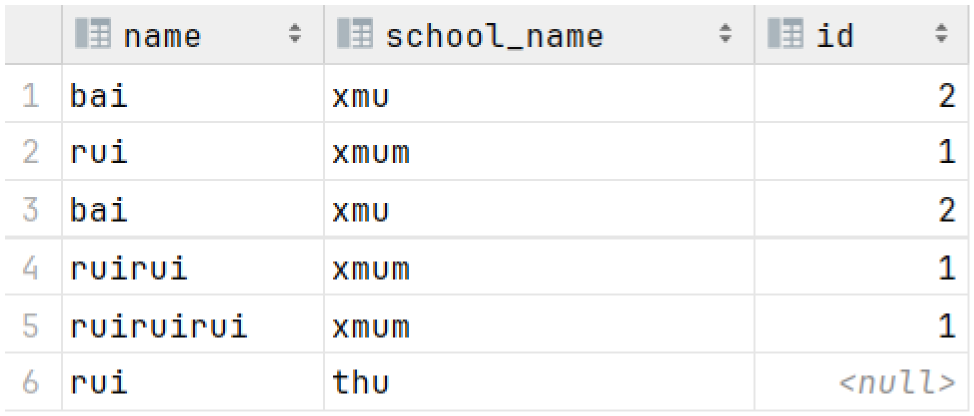


	name	school_name	id
1	bai	xmu	2
2	rui	xmum	1
3	bai	xmu	2
4	ruirui	xmum	1
5	ruiruirui	xmum	1
6	rui	thu	<null>

right join

返回左表中的所有记录，即使右表中没有相应的记录(会返回null)

```
select stu.name,stu.school_name
from school s
right join student stu
on stu.school_name=s.school_name;
```

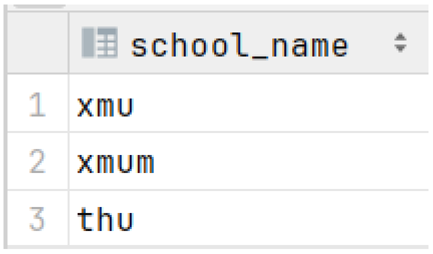


	name	school_name	id
1	bai	xmu	2
2	rui	xmum	1
3	bai	xmu	2
4	ruirui	xmum	1
5	ruiruirui	xmum	1
6	rui	thu	<null>

union

将多次查询的结果聚在一起并去重

```
select school_name
from student
union
select school_name
from school;
```



	school_name
1	xmu
2	xmum
3	thu

4.3 聚合函数

count()

用于各组表中计算记录的数量

```
select school_name,count(*) as sum
from student
group by school_name;
```

sum()

用于计算各组表中数值字段的记录和

```
select school_name,sum(age) as sum_age
from student
group by school_name;
```

avg()

用于计算各组表中数值字段的记录平均值

```
select school_name,avg(age) as sum_age
from student
group by school_name;
```

min()

用于计算各组表中数值字段的记录最小值

```
select school_name,min(age) as sum_age
from student
group by school_name;
```

max()

用于计算各组表中数值字段的记录最大值

```
select school_name,max(age) as sum_age
from student
group by school_name;
```