# 课程介绍

- 了解Mybatis-Plus
- 整合Mybatis-Plus
- 通用CRUD
- Mybatis-Plus的配置
- 条件构造器

# 1、了解Mybatis-Plus

## 1.1、Mybatis-Plus介绍

MyBatis-Plus（简称 MP）是一个 MyBatis 的增强工具，在 MyBatis 的基础上只做增强不做改变，为简化开发、提高效率而生。

官网：https://mybatis.plus/ 或 https://mp.baomidou.com/

润物无声

只做增强不做改变，引入它不会对现有工程产生影响，如丝般顺滑。

效率至上

只需简单配置，即可快速进行 CRUD 操作，从而节省大量时间。

丰富功能

热加载、代码生成、分页、性能分析等功能一应俱全。

> **愿景**
>
> 我们的愿景是成为 MyBatis 最好的搭档，就像 魂斗罗 中的 1P、2P，基友搭配，效率翻倍。

## 1.2、代码以及文档

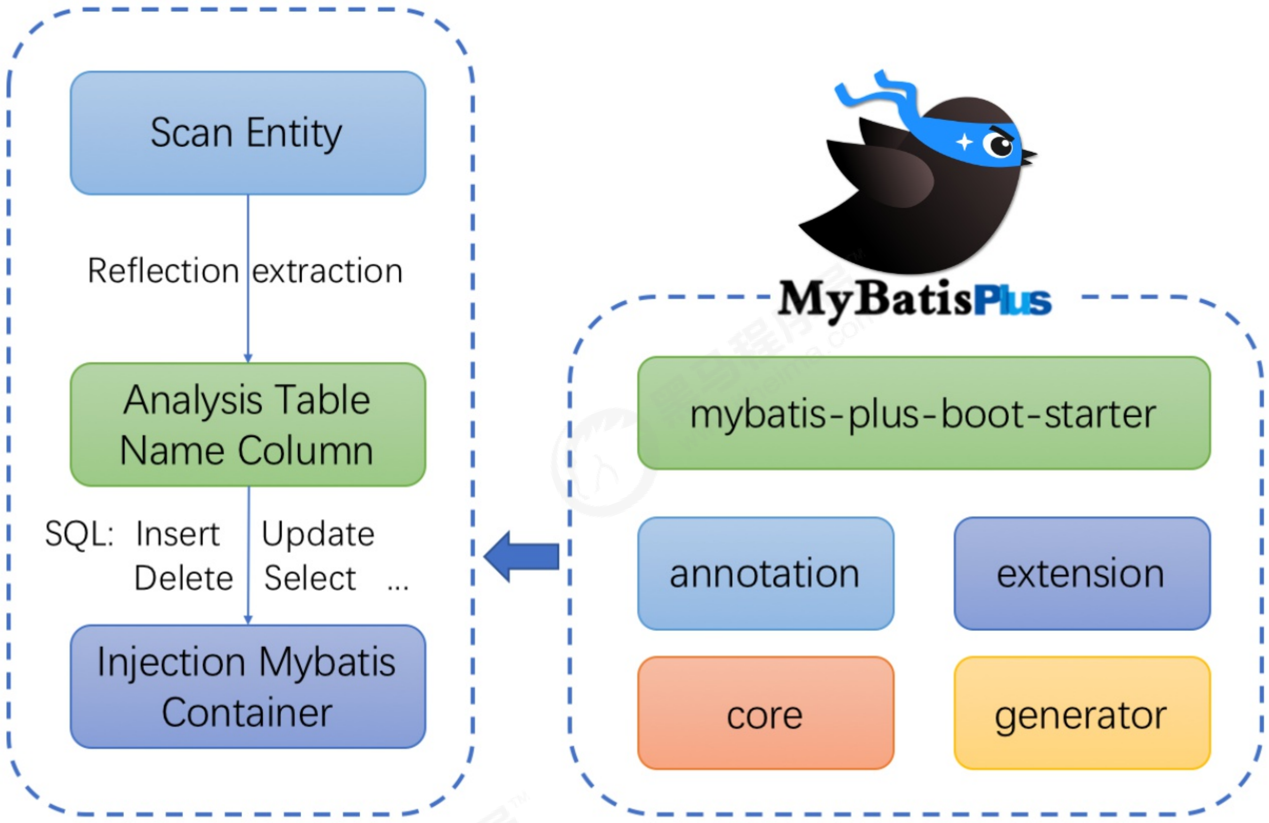
文档地址：https://mybatis.plus/guide/

源码地址：https://github.com/baomidou/mybatis-plus

## 1.3、特性

- **无侵入**：只做增强不做改变，引入它不会对现有工程产生影响，如丝般顺滑
- **损耗小**：启动即会自动注入基本 CURD，性能基本无损耗，直接面向对象操作
- **强大的 CRUD 操作**：内置通用 Mapper、通用 Service，仅仅通过少量配置即可实现单表大部分 CRUD 操作，更有强大的条件构造器，满足各类使用需求
- **支持 Lambda 形式调用**：通过 Lambda 表达式，方便的编写各类查询条件，无需再担心字段写错
- **支持多种数据库**：支持 MySQL、MariaDB、Oracle、DB2、H2、HSQL、SQLite、Postgre、SQLServer2005、SQLServer 等多种数据库
- **支持主键自动生成**：支持多达 4 种主键策略（内含分布式唯一 ID 生成器 - Sequence），可自由配置，完美解决主键问题
- **支持 XML 热加载**：Mapper 对应的 XML 支持热加载，对于简单的 CRUD 操作，甚至可以无 XML 启动
- **支持 ActiveRecord 模式**：支持 ActiveRecord 形式调用，实体类只需继承 Model 类即可进行强大的 CRUD 操作
- **支持自定义全局通用操作**：支持全局通用方法注入（ Write once, use anywhere ）
- **支持关键词自动转义**：支持数据库关键词（order、key......）自动转义，还可自定义关键词
- **内置代码生成器**：采用代码或者 Maven 插件可快速生成 Mapper 、 Model 、 Service 、 Controller 层代码，支持模板引擎，更有超多自定义配置等您来使用
- **内置分页插件**：基于 MyBatis 物理分页，开发者无需关心具体操作，配置好插件之后，写分页等同于普通 List 查询
- **内置性能分析插件**：可输出 Sql 语句以及其执行时间，建议开发测试时启用该功能，能快速揪出慢查询
- **内置全局拦截插件**：提供全表 delete 、 update 操作智能分析阻断，也可自定义拦截规则，预防误操作
- **内置 Sql 注入剥离器**：支持 Sql 注入剥离，有效预防 Sql 注入攻击

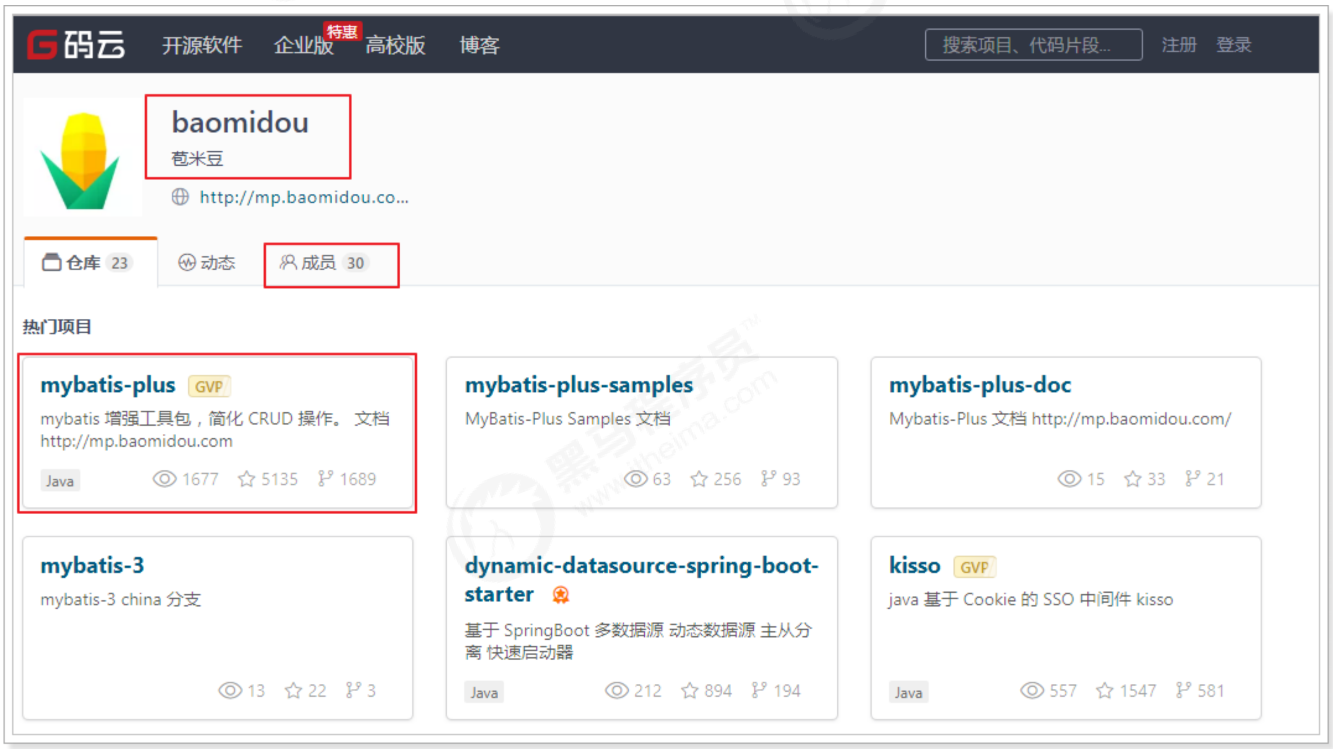
## 1.4、架构


Scan Entity
Reflection extraction
Analysis Table Name Column
SQL: Insert Update Delete Select ...
Injection Mybatis Container
MyBatisPlus
mybatis-plus-boot-starter
annotation
extension
core
generator

## 1.5、作者

Mybatis-Plus是由baomidou（苞米豆）组织开发并且开源的，目前该组织大概有30人左右。

码云地址：[https://gitee.com/organizations/baomidou](https://gitee.com/organizations/baomidou)


码云 开源软件 企业版 特惠 高校版 博客 搜索项目、代码片段... 注册 登录

baomidou
苞米豆
http://mp.baomidou.co...

仓库 23　动态　成员 30

热门项目

mybatis-plus GVP
mybatis 增强工具包，简化 CRUD 操作。 文档 http://mp.baomidou.com
Java 1677 5135 1689

mybatis-plus-samples
MyBatis-Plus Samples 文档
63 256 93

mybatis-plus-doc
Mybatis-Plus 文档 http://mp.baomidou.com/
15 33 21

mybatis-3
mybatis-3 china 分支
13 22 3

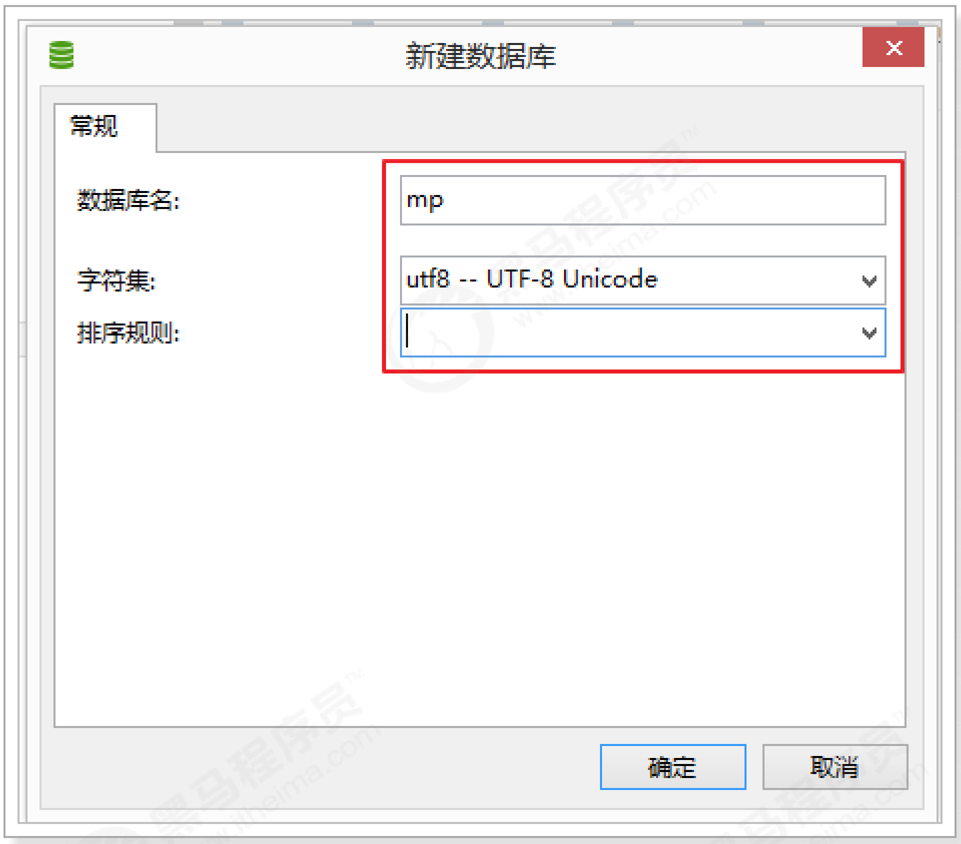
dynamic-datasource-spring-boot-starter
基于 SpringBoot 多数据源 动态数据源 主从分离 快速启动器
Java 212 894 194

kisso GVP
java 基于 Cookie 的 SSO 中间件 kisso
Java 557 1547 581

## 2、快速开始

对于Mybatis整合MP有常常有三种用法，分别是Mybatis+MP、Spring+Mybatis+MP、Spring Boot+Mybatis+MP。

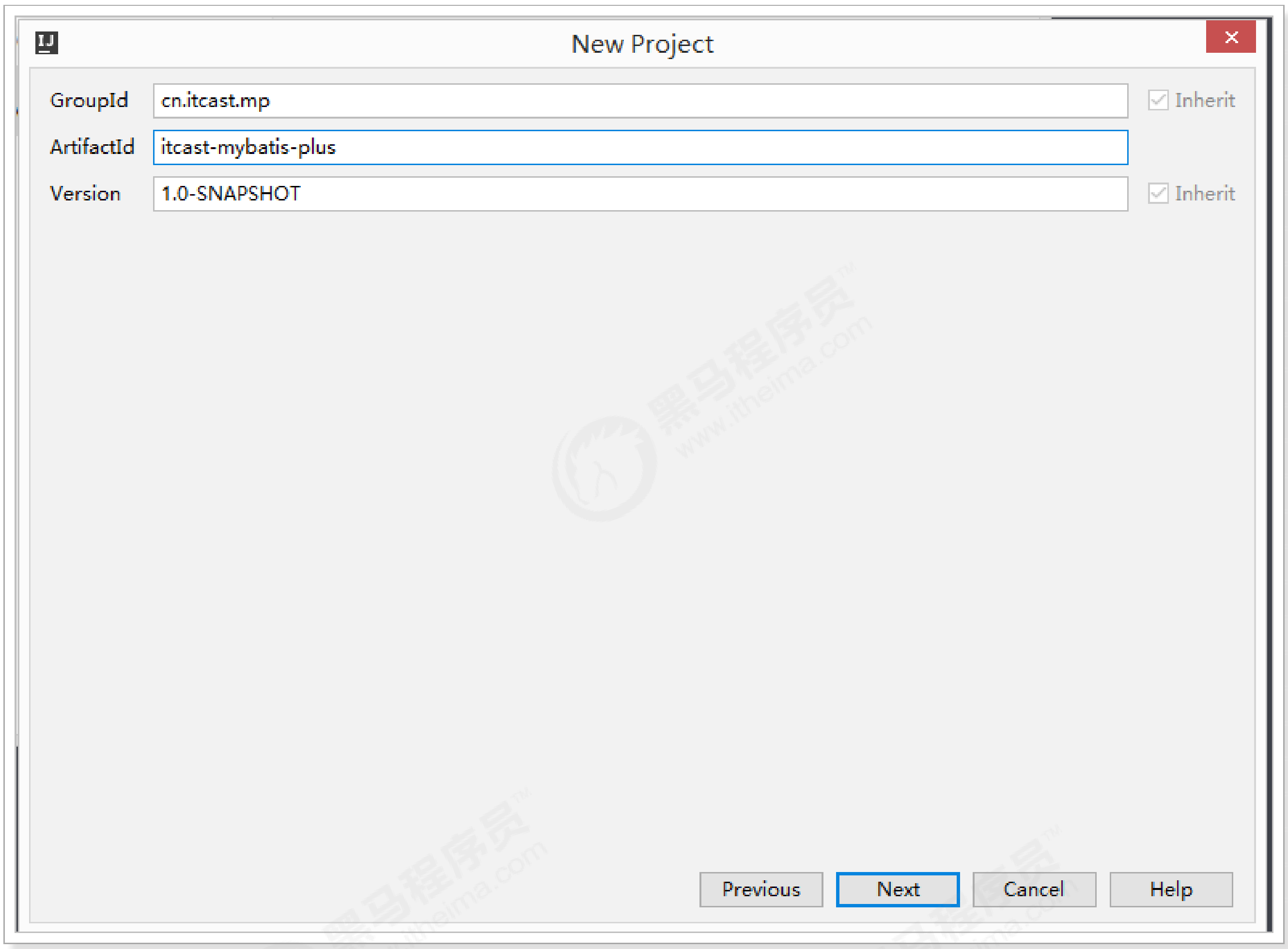
## 2.1、创建数据库以及表



数据库名: mp
字符集: utf8 -- UTF-8 Unicode
排序规则:

```sql
-- 创建测试表
CREATE TABLE `tb_user` (
  `id` bigint(20) NOT NULL AUTO_INCREMENT COMMENT '主键ID',
  `user_name` varchar(20) NOT NULL COMMENT '用户名',
  `password` varchar(20) NOT NULL COMMENT '密码',
  `name` varchar(30) DEFAULT NULL COMMENT '姓名',
  `age` int(11) DEFAULT NULL COMMENT '年龄',
  `email` varchar(50) DEFAULT NULL COMMENT '邮箱',
  PRIMARY KEY (`id`)
) ENGINE=InnoDB AUTO_INCREMENT=1 DEFAULT CHARSET=utf8;

-- 插入测试数据
INSERT INTO `tb_user` (`id`, `user_name`, `password`, `name`, `age`, `email`) VALUES
('1', 'zhangsan', '123456', '张三', '18', 'test1@itcast.cn');
INSERT INTO `tb_user` (`id`, `user_name`, `password`, `name`, `age`, `email`) VALUES
('2', 'lisi', '123456', '李四', '20', 'test2@itcast.cn');
INSERT INTO `tb_user` (`id`, `user_name`, `password`, `name`, `age`, `email`) VALUES
('3', 'wangwu', '123456', '王五', '28', 'test3@itcast.cn');
INSERT INTO `tb_user` (`id`, `user_name`, `password`, `name`, `age`, `email`) VALUES
('4', 'zhaoliu', '123456', '赵六', '21', 'test4@itcast.cn');
INSERT INTO `tb_user` (`id`, `user_name`, `password`, `name`, `age`, `email`) VALUES
('5', 'sunqi', '123456', '孙七', '24', 'test5@itcast.cn');
```

## 2.2、创建工程


New Project

GroupId: cn.itcast.mp　☑ Inherit

ArtifactId: itcast-mybatis-plus

Version: 1.0-SNAPSHOT　☑ Inherit

导入依赖：

```xml
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0"
         xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
         xsi:schemaLocation="http://maven.apache.org/POM/4.0.0
http://maven.apache.org/xsd/maven-4.0.0.xsd">
    <modelVersion>4.0.0</modelVersion>

    <groupId>cn.itcast.mp</groupId>
    <artifactId>itcast-mybatis-plus</artifactId>
    <version>1.0-SNAPSHOT</version>
    <modules>
        <module>itcast-mybatis-plus-simple</module>
    </modules>
    <packaging>pom</packaging>

    <dependencies>
        <!-- mybatis-plus插件依赖 -->
        <dependency>
            <groupId>com.baomidou</groupId>
            <artifactId>mybatis-plus</artifactId>
            <version>3.1.1</version>
        </dependency>
        <!-- MySql -->
        <dependency>
            <groupId>mysql</groupId>
            <artifactId>mysql-connector-java</artifactId>
            <version>5.1.47</version>
        </dependency>
        <!-- 连接池 -->
        <dependency>
            <groupId>com.alibaba</groupId>
            <artifactId>druid</artifactId>
            <version>1.0.11</version>
        </dependency>
        <!--简化bean代码的工具包-->
        <dependency>
            <groupId>org.projectlombok</groupId>
            <artifactId>lombok</artifactId>
            <optional>true</optional>
            <version>1.18.4</version>
        </dependency>
        <dependency>
            <groupId>junit</groupId>
            <artifactId>junit</artifactId>
            <version>4.12</version>
        </dependency>
        <dependency>
            <groupId>org.slf4j</groupId>
            <artifactId>slf4j-log4j12</artifactId>
            <version>1.6.4</version>
        </dependency>
    </dependencies>

    <build>
        <plugins>
            <plugin>
                <groupId>org.apache.maven.plugins</groupId>
                <artifactId>maven-compiler-plugin</artifactId>
                <configuration>
                    <source>1.8</source>
                    <target>1.8</target>
                </configuration>
            </plugin>
        </plugins>
    </build>

</project>
```

## 2.3、Mybatis + MP

下面演示，通过纯Mybatis与Mybatis-Plus整合。

### 2.3.1、创建子Module

```xml
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0"
```

```
         xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
         xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">
    <parent>
        <artifactId>itcast-mybatis-plus</artifactId>
        <groupId>cn.itcast.mp</groupId>
        <version>1.0-SNAPSHOT</version>
    </parent>
    <modelVersion>4.0.0</modelVersion>
    <packaging>jar</packaging>

    <artifactId>itcast-mybatis-plus-simple</artifactId>

</project>
```

log4j.properties：

```
log4j.rootLogger=DEBUG,A1

log4j.appender.A1=org.apache.log4j.ConsoleAppender
log4j.appender.A1.layout=org.apache.log4j.PatternLayout
log4j.appender.A1.layout.ConversionPattern=[%t] [%c]-[%p] %m%n
```

### 2.3.2、Mybatis实现查询User

> **第一步，编写mybatis-config.xml文件：**

```
<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE configuration
        PUBLIC "-//mybatis.org//DTD Config 3.0//EN"
        "http://mybatis.org/dtd/mybatis-3-config.dtd">
<configuration>
    <environments default="development">
        <environment id="development">
            <transactionManager type="JDBC"/>
            <dataSource type="POOLED">
                <property name="driver" value="com.mysql.jdbc.Driver"/>
                <property name="url" value="jdbc:mysql://127.0.0.1:3306/mp?useUnicode=true&amp;characterEncoding=utf8&amp;autoReconnect=true&amp;allowMultiQueries=true&amp;useSSL=false"/>
                <property name="username" value="root"/>
                <property name="password" value="root"/>
            </dataSource>
        </environment>
    </environments>
    <mappers>
        <mapper resource="UserMapper.xml"/>
    </mappers>
</configuration>
```

> **第二步，编写User实体对象：（这里使用lombok进行了进化bean操作）**

```java
package cn.itcast.mp.simple.pojo;

import lombok.AllArgsConstructor;
import lombok.Data;
import lombok.NoArgsConstructor;

@Data
@NoArgsConstructor
@AllArgsConstructor
public class User {

    private Long id;
    private String userName;
    private String password;
    private String name;
    private Integer age;
    private String email;
}

```

**第三步，编写UserMapper接口：**

```java
package cn.itcast.mp.simple.mapper;

import cn.itcast.mp.simple.pojo.User;

import java.util.List;

public interface UserMapper {

    List<User> findAll();

}

```

**第四步，编写UserMapper.xml文件：**

```xml
<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE mapper
        PUBLIC "-//mybatis.org//DTD Mapper 3.0//EN"
        "http://mybatis.org/dtd/mybatis-3-mapper.dtd">
<mapper namespace="cn.itcast.mp.simple.mapper.UserMapper">

    <select id="findAll" resultType="cn.itcast.mp.simple.pojo.User">
      select * from tb_user
    </select>

</mapper>
```

**第五步，编写TestMybatis测试用例：**

```java
package cn.itcast.mp.simple;

import cn.itcast.mp.simple.mapper.UserMapper;
import cn.itcast.mp.simple.pojo.User;
import org.apache.ibatis.io.Resources;
import org.apache.ibatis.session.SqlSession;
import org.apache.ibatis.session.SqlSessionFactory;
import org.apache.ibatis.session.SqlSessionFactoryBuilder;
import org.junit.Test;

import java.io.InputStream;
import java.util.List;

public class TestMybatis {

    @Test
    public void testUserList() throws Exception{
        String resource = "mybatis-config.xml";
        InputStream inputStream = Resources.getResourceAsStream(resource);
        SqlSessionFactory sqlSessionFactory = new
SqlSessionFactoryBuilder().build(inputStream);
        SqlSession sqlSession = sqlSessionFactory.openSession();

        UserMapper userMapper = sqlSession.getMapper(UserMapper.class);
        List<User> list = userMapper.findAll();
        for (User user : list) {
            System.out.println(user);
        }

    }

}

```

测试结果：

```
[main] [cn.itcast.mp.simple.mapper.UserMapper.findAll]-[DEBUG] ==> Parameters:
[main] [cn.itcast.mp.simple.mapper.UserMapper.findAll]-[DEBUG] <==      Total: 5
User(id=1, userName=null, password=123456, name=张三, age=18, email=test1@itcast.cn)
User(id=2, userName=null, password=123456, name=李四, age=20, email=test2@itcast.cn)
User(id=3, userName=null, password=123456, name=王五, age=28, email=test3@itcast.cn)
User(id=4, userName=null, password=123456, name=赵六, age=21, email=test4@itcast.cn)
User(id=5, userName=null, password=123456, name=孙七, age=24, email=test5@itcast.cn)
```

### 2.3.3、Mybatis+MP实现查询User

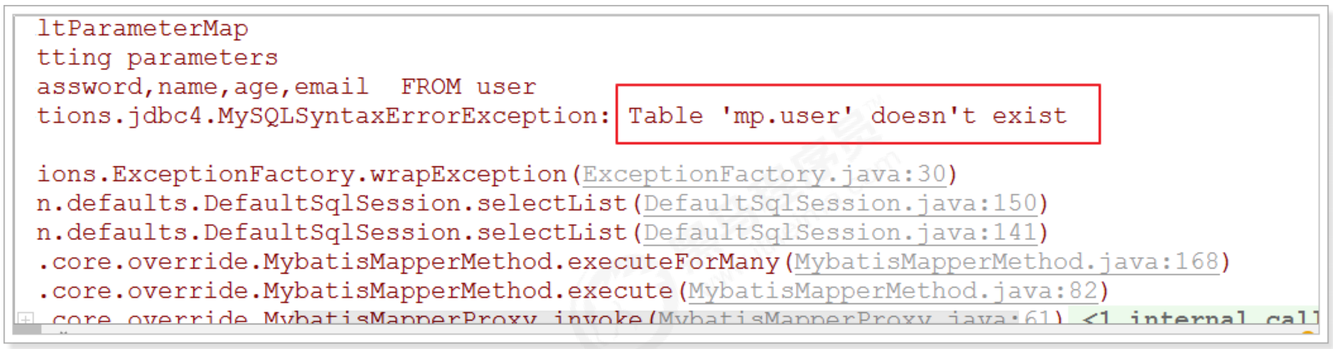
> **第一步，将UserMapper继承BaseMapper，将拥有了BaseMapper中的所有方法：**

```java
package cn.itcast.mp.simple.mapper;

import cn.itcast.mp.simple.pojo.User;
import com.baomidou.mybatisplus.core.mapper.BaseMapper;

import java.util.List;

public interface UserMapper extends BaseMapper<User> {

    List<User> findAll();

}

```

第二步，使用MP中的MybatisSqlSessionFactoryBuilder进程构建：

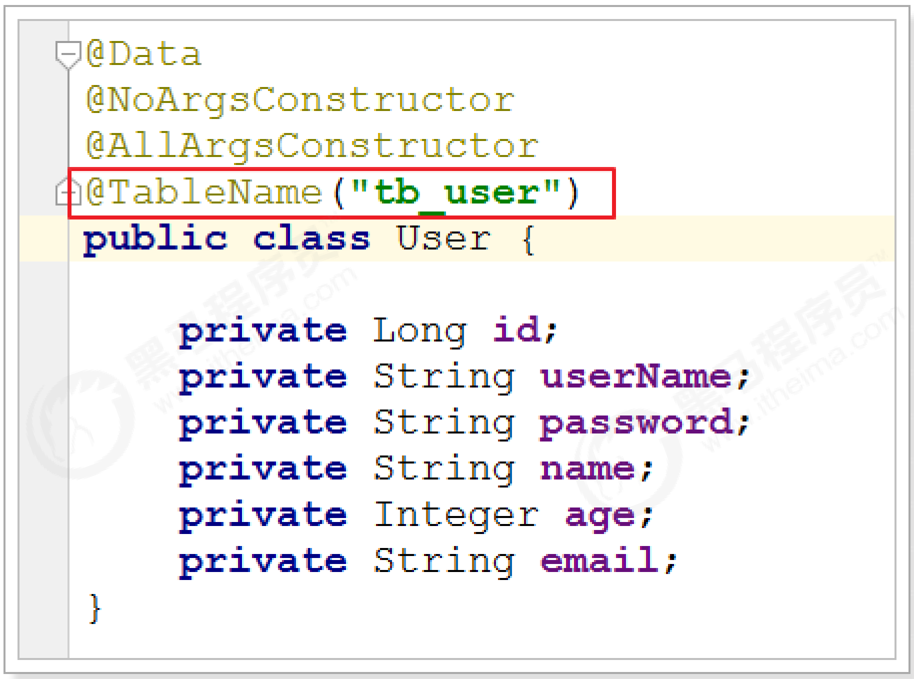
```java
package cn.itcast.mp.simple;

import cn.itcast.mp.simple.mapper.UserMapper;
import cn.itcast.mp.simple.pojo.User;
import com.baomidou.mybatisplus.core.MybatisSqlSessionFactoryBuilder;
import org.apache.ibatis.io.Resources;

import org.apache.ibatis.session.SqlSession;
import org.apache.ibatis.session.SqlSessionFactory;
import org.apache.ibatis.session.SqlSessionFactoryBuilder;
import org.junit.Test;

import java.io.InputStream;
import java.util.List;

public class TestMybatisPlus {

    @Test
    public void testUserList() throws Exception{
        String resource = "mybatis-config.xml";
        InputStream inputStream = Resources.getResourceAsStream(resource);
        //这里使用的是MP中的MybatisSqlSessionFactoryBuilder
        SqlSessionFactory sqlSessionFactory = new
MybatisSqlSessionFactoryBuilder().build(inputStream);
        SqlSession sqlSession = sqlSessionFactory.openSession();

        UserMapper userMapper = sqlSession.getMapper(UserMapper.class);

        // 可以调用BaseMapper中定义的方法
        List<User> list = userMapper.selectList(null);
        for (User user : list) {
            System.out.println(user);
        }

    }

}

```

运行报错：



```
ltParameterMap
tting parameters
assword,name,age,email  FROM user
tions.jdbc4.MySQLSyntaxErrorException: Table 'mp.user' doesn't exist

ions.ExceptionFactory.wrapException(ExceptionFactory.java:30)
n.defaults.DefaultSqlSession.selectList(DefaultSqlSession.java:150)
n.defaults.DefaultSqlSession.selectList(DefaultSqlSession.java:141)
.core.override.MybatisMapperMethod.executeForMany(MybatisMapperMethod.java:168)
.core.override.MybatisMapperMethod.execute(MybatisMapperMethod.java:82)
.core.override.MybatisMapperProxy.invoke(MybatisMapperProxy.java:61) <1 internal call
```

解决：在User对象中添加@TableName，指定数据库表名



```java
@Data
@NoArgsConstructor
@AllArgsConstructor
@TableName("tb_user")
public class User {

    private Long id;
    private String userName;
    private String password;
    private String name;
    private Integer age;
    private String email;
}
```

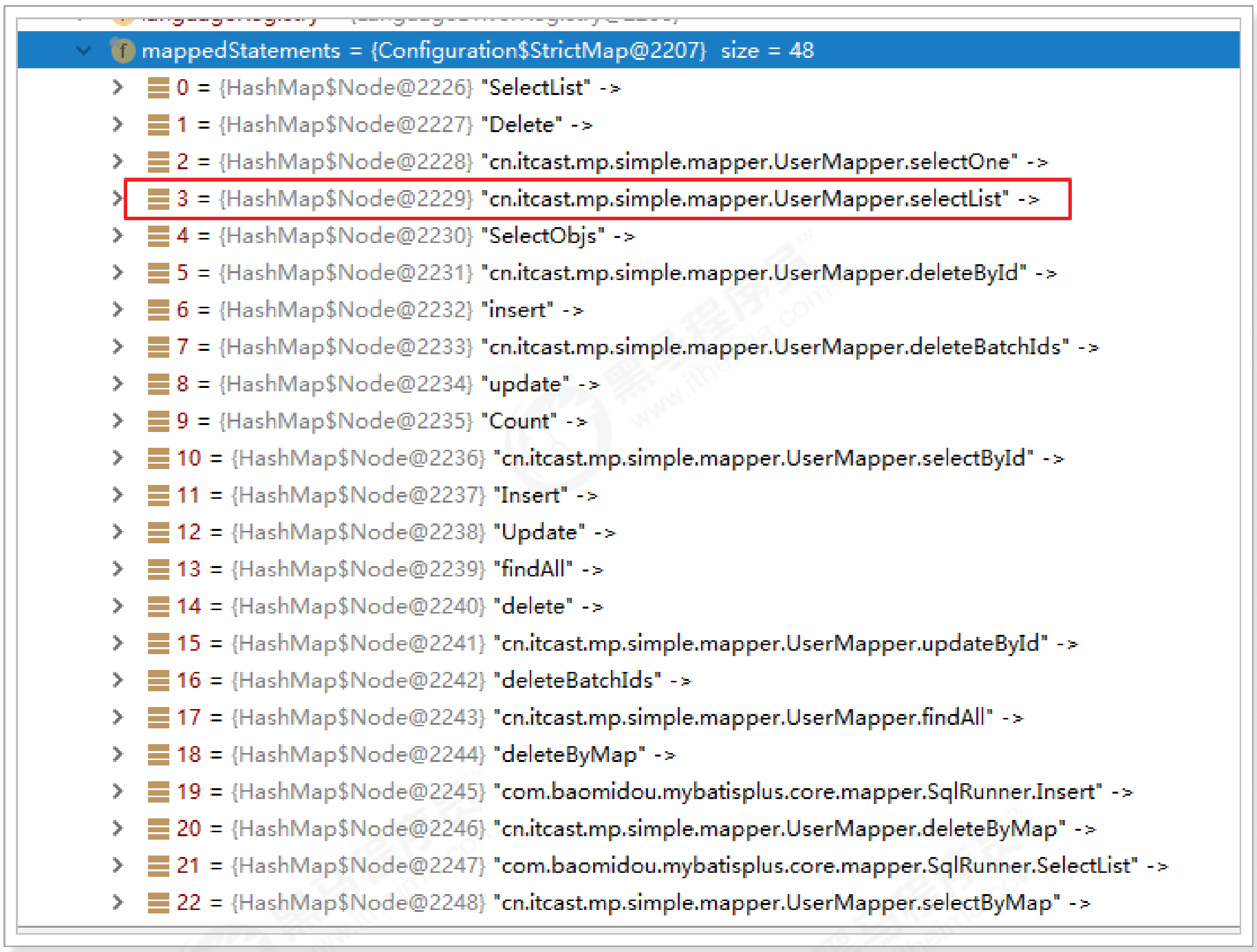
测试：

```
[main] [cn.itcast.mp.simple.mapper.UserMapper.selectList]-[DEBUG] ==>  Preparing:
SELECT id,user_name,password,name,age,email  FROM tb_user
[main] [cn.itcast.mp.simple.mapper.UserMapper.selectList]-[DEBUG] ==> Parameters:
[main] [cn.itcast.mp.simple.mapper.UserMapper.selectList]-[DEBUG] <==      Total: 5
User(id=1, userName=zhangsan, password=123456, name=张三, age=18, email=test1@itcast.cn)
User(id=2, userName=lisi, password=123456, name=李四, age=20, email=test2@itcast.cn)
User(id=3, userName=wangwu, password=123456, name=王五, age=28, email=test3@itcast.cn)
User(id=4, userName=zhaoliu, password=123456, name=赵六, age=21, email=test4@itcast.cn)
User(id=5, userName=sunqi, password=123456, name=孙七, age=24, email=test5@itcast.cn)
```

简单说明：

- 由于使用了MybatisSqlSessionFactoryBuilder进行了构建，继承的BaseMapper中的方法就载入到了SqlSession中，所以就可以直接使用相关的方法；

- 如图：



```
mappedStatements = {Configuration$StrictMap@2207}  size = 48
    0 = {HashMap$Node@2226} "SelectList" ->
    1 = {HashMap$Node@2227} "Delete" ->
    2 = {HashMap$Node@2228} "cn.itcast.mp.simple.mapper.UserMapper.selectOne" ->
    3 = {HashMap$Node@2229} "cn.itcast.mp.simple.mapper.UserMapper.selectList" ->
    4 = {HashMap$Node@2230} "SelectObjs" ->
    5 = {HashMap$Node@2231} "cn.itcast.mp.simple.mapper.UserMapper.deleteById" ->
    6 = {HashMap$Node@2232} "insert" ->
    7 = {HashMap$Node@2233} "cn.itcast.mp.simple.mapper.UserMapper.deleteBatchIds" ->
    8 = {HashMap$Node@2234} "update" ->
    9 = {HashMap$Node@2235} "Count" ->
    10 = {HashMap$Node@2236} "cn.itcast.mp.simple.mapper.UserMapper.selectById" ->
    11 = {HashMap$Node@2237} "Insert" ->
    12 = {HashMap$Node@2238} "Update" ->
    13 = {HashMap$Node@2239} "findAll" ->
    14 = {HashMap$Node@2240} "delete" ->
    15 = {HashMap$Node@2241} "cn.itcast.mp.simple.mapper.UserMapper.updateById" ->
    16 = {HashMap$Node@2242} "deleteBatchIds" ->
    17 = {HashMap$Node@2243} "cn.itcast.mp.simple.mapper.UserMapper.findAll" ->
    18 = {HashMap$Node@2244} "deleteByMap" ->
    19 = {HashMap$Node@2245} "com.baomidou.mybatisplus.core.mapper.SqlRunner.Insert" ->
    20 = {HashMap$Node@2246} "cn.itcast.mp.simple.mapper.UserMapper.deleteByMap" ->
    21 = {HashMap$Node@2247} "com.baomidou.mybatisplus.core.mapper.SqlRunner.SelectList" ->
    22 = {HashMap$Node@2248} "cn.itcast.mp.simple.mapper.UserMapper.selectByMap" ->
```

## 2.4、Spring + Mybatis + MP

引入了Spring框架，数据源、构建等工作就交给了Spring管理。

### 2.4.1、创建子Module

```xml
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0"
         xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
         xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">
    <parent>
        <artifactId>itcast-mybatis-plus</artifactId>
        <groupId>cn.itcast.mp</groupId>
        <version>1.0-SNAPSHOT</version>
    </parent>
    <modelVersion>4.0.0</modelVersion>

    <artifactId>itcast-mybatis-plus-spring</artifactId>

    <properties>
        <spring.version>5.1.6.RELEASE</spring.version>
    </properties>

    <dependencies>
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-webmvc</artifactId>
            <version>${spring.version}</version>
        </dependency>
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-jdbc</artifactId>
            <version>${spring.version}</version>
        </dependency>
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-test</artifactId>
            <version>${spring.version}</version>
        </dependency>
    </dependencies>


</project>
```

### 2.4.2、实现查询User

第一步，编写jdbc.properties

```
jdbc.driver=com.mysql.jdbc.Driver
jdbc.url=jdbc:mysql://127.0.0.1:3306/mp?useUnicode=true&characterEncoding=utf8&autoReconnect=true&allowMultiQueries=true&useSSL=false
jdbc.username=root
jdbc.password=root
```

第二步，编写applicationContext.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<beans xmlns="http://www.springframework.org/schema/beans"
       xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
       xmlns:context="http://www.springframework.org/schema/context"
       xsi:schemaLocation="http://www.springframework.org/schema/beans
        http://www.springframework.org/schema/beans/spring-beans.xsd
        http://www.springframework.org/schema/context
        http://www.springframework.org/schema/context/spring-context.xsd">

    <context:property-placeholder location="classpath:*.properties"/>

    <!-- 定义数据源 -->
    <bean id="dataSource" class="com.alibaba.druid.pool.DruidDataSource"
          destroy-method="close">
        <property name="url" value="${jdbc.url}"/>
        <property name="username" value="${jdbc.username}"/>
        <property name="password" value="${jdbc.password}"/>
        <property name="driverClassName" value="${jdbc.driver}"/>
```

```xml
            <property name="maxActive" value="10"/>
            <property name="minIdle" value="5"/>
        </bean>

        <!--这里使用MP提供的sqlSessionFactory，完成了Spring与MP的整合-->
        <bean id="sqlSessionFactory"
class="com.baomidou.mybatisplus.extension.spring.MybatisSqlSessionFactoryBean">
            <property name="dataSource" ref="dataSource"/>
        </bean>

        <!--扫描mapper接口，使用的依然是Mybatis原生的扫描器-->
        <bean class="org.mybatis.spring.mapper.MapperScannerConfigurer">
            <property name="basePackage" value="cn.itcast.mp.simple.mapper"/>
        </bean>

</beans>

```

第三步，编写User对象以及UserMapper接口：

```java
package cn.itcast.mp.simple.pojo;

import com.baomidou.mybatisplus.annotation.TableName;
import lombok.AllArgsConstructor;
import lombok.Data;
import lombok.NoArgsConstructor;

@Data
@NoArgsConstructor
@AllArgsConstructor
@TableName("tb_user")
public class User {

    private Long id;
    private String userName;
    private String password;
    private String name;
    private Integer age;
    private String email;
}

```

```java
package cn.itcast.mp.simple.mapper;

import cn.itcast.mp.simple.pojo.User;
import com.baomidou.mybatisplus.core.mapper.BaseMapper;

public interface UserMapper extends BaseMapper<User> {

}
```

第四步，编写测试用例：

```java
package cn.itcast.mp.simple;

import cn.itcast.mp.simple.mapper.UserMapper;
import cn.itcast.mp.simple.pojo.User;
import org.junit.Test;
import org.junit.runner.RunWith;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.test.context.ContextConfiguration;
import org.springframework.test.context.junit4.SpringJUnit4ClassRunner;

import java.util.List;

@RunWith(SpringJUnit4ClassRunner.class)
@ContextConfiguration(locations = "classpath:applicationContext.xml")
public class TestSpringMP {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testSelectList(){
        List<User> users = this.userMapper.selectList(null);
        for (User user : users) {
            System.out.println(user);
        }
    }

}

```

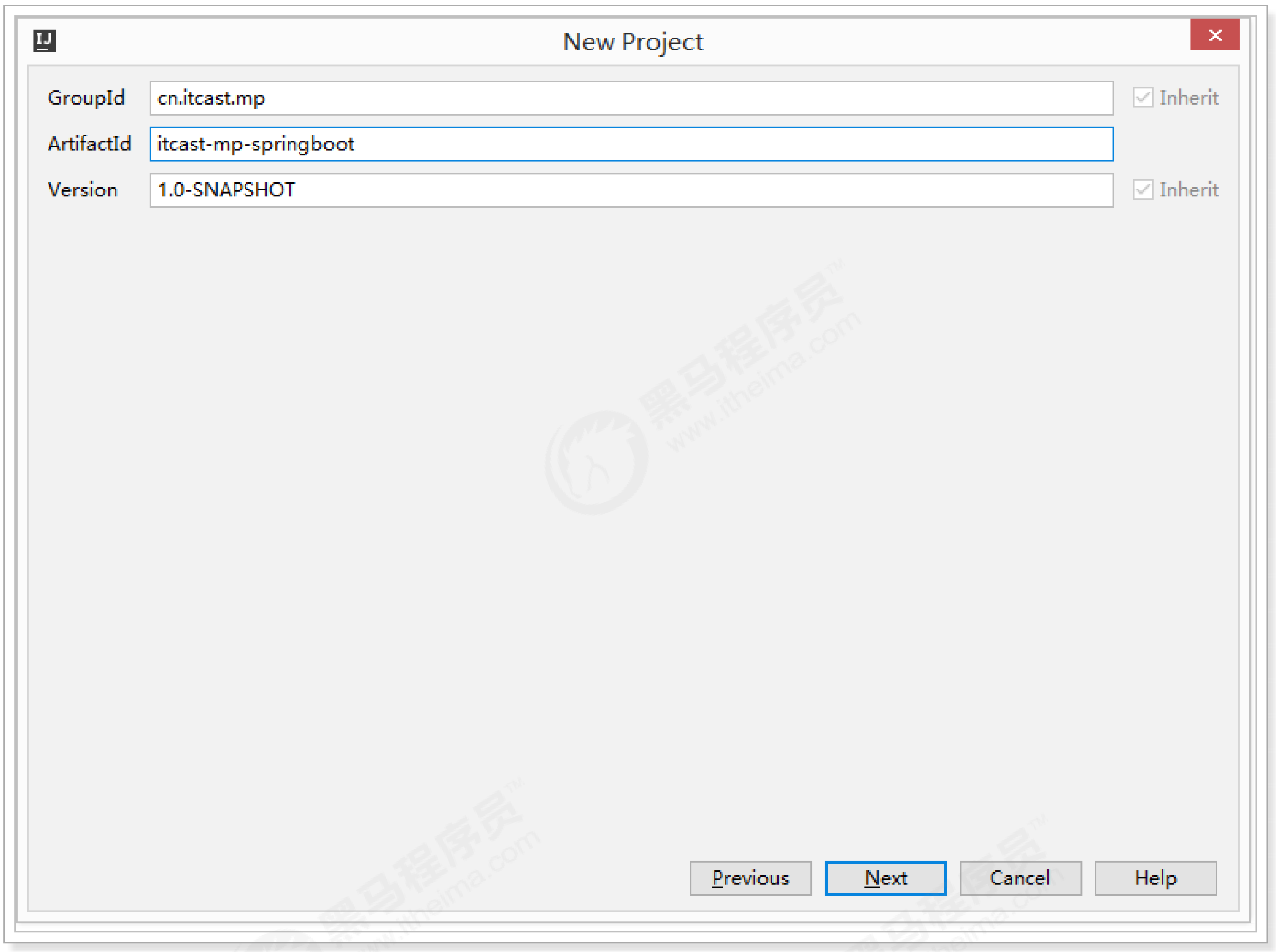
测试：

```
[main] [cn.itcast.mp.simple.mapper.UserMapper.selectList]-[DEBUG] ==>  Preparing: SELECT id,user_name,password,name,age,email FROM tb_user
[main] [cn.itcast.mp.simple.mapper.UserMapper.selectList]-[DEBUG] ==> Parameters:
[main] [cn.itcast.mp.simple.mapper.UserMapper.selectList]-[DEBUG] <==      Total: 5
[main] [org.mybatis.spring.SqlSessionUtils]-[DEBUG] Closing non transactional SqlSession [org.apache.ibatis.session.defaults.DefaultSqlSession@74287ea3]
User(id=1, userName=zhangsan, password=123456, name=张三, age=18, email=test1@itcast.cn)
User(id=2, userName=lisi, password=123456, name=李四, age=20, email=test2@itcast.cn)
User(id=3, userName=wangwu, password=123456, name=王五, age=28, email=test3@itcast.cn)
User(id=4, userName=zhaoliu, password=123456, name=赵六, age=21, email=test4@itcast.cn)
User(id=5, userName=sunqi, password=123456, name=孙七, age=24, email=test5@itcast.cn)

```

## 2.5、SpringBoot + Mybatis + MP

使用SpringBoot将进一步的简化MP的整合，需要注意的是，由于使用SpringBoot需要继承parent，所以需要重新创建工程，并不是创建子Module。

### 2.5.1、创建工程


New Project

GroupId: cn.itcast.mp ☑ Inherit
ArtifactId: itcast-mp-springboot
Version: 1.0-SNAPSHOT ☑ Inherit

### 2.5.2、导入依赖

```
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0"
         xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
         xsi:schemaLocation="http://maven.apache.org/POM/4.0.0
http://maven.apache.org/xsd/maven-4.0.0.xsd">
    <modelVersion>4.0.0</modelVersion>

    <parent>
        <groupId>org.springframework.boot</groupId>
        <artifactId>spring-boot-starter-parent</artifactId>
        <version>2.1.4.RELEASE</version>
    </parent>

    <groupId>cn.itcast.mp</groupId>
    <artifactId>itcast-mp-springboot</artifactId>
    <version>1.0-SNAPSHOT</version>

    <dependencies>
        <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-starter</artifactId>
            <exclusions>
                <exclusion>
```

```xml
                    <groupId>org.springframework.boot</groupId>
                    <artifactId>spring-boot-starter-logging</artifactId>
                </exclusion>
            </exclusions>
        </dependency>
        <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-starter-test</artifactId>
            <scope>test</scope>
        </dependency>

        <!--简化代码的工具包-->
        <dependency>
            <groupId>org.projectlombok</groupId>
            <artifactId>lombok</artifactId>
            <optional>true</optional>
        </dependency>
        <!--mybatis-plus的springboot支持-->
        <dependency>
            <groupId>com.baomidou</groupId>
            <artifactId>mybatis-plus-boot-starter</artifactId>
            <version>3.1.1</version>
        </dependency>
        <!--mysql驱动-->
        <dependency>
            <groupId>mysql</groupId>
            <artifactId>mysql-connector-java</artifactId>
            <version>5.1.47</version>
        </dependency>
        <dependency>
            <groupId>org.slf4j</groupId>
            <artifactId>slf4j-log4j12</artifactId>
        </dependency>

    </dependencies>

    <build>
        <plugins>
            <plugin>
                <groupId>org.springframework.boot</groupId>
                <artifactId>spring-boot-maven-plugin</artifactId>
            </plugin>
        </plugins>
    </build>

</project>
```

log4j.properties：

```
log4j.rootLogger=DEBUG,A1

log4j.appender.A1=org.apache.log4j.ConsoleAppender
log4j.appender.A1.layout=org.apache.log4j.PatternLayout
log4j.appender.A1.layout.ConversionPattern=[%t] [%c]-[%p] %m%n
```

### 2.5.3、编写application.properties

```
spring.application.name = itcast-mp-springboot

spring.datasource.driver-class-name=com.mysql.jdbc.Driver
spring.datasource.url=jdbc:mysql://127.0.0.1:3306/mp?useUnicode=true&characterEncoding=utf8&autoReconnect=true&allowMultiQueries=true&useSSL=false
spring.datasource.username=root
spring.datasource.password=root
```

### 2.5.4、编写pojo

```java
package cn.itcast.mp.pojo;

import com.baomidou.mybatisplus.annotation.TableName;
import lombok.AllArgsConstructor;
import lombok.Data;
import lombok.NoArgsConstructor;

@Data
@NoArgsConstructor
@AllArgsConstructor
@TableName("tb_user")
public class User {

    private Long id;
    private String userName;
    private String password;
    private String name;
    private Integer age;
    private String email;
}
```

### 2.5.5、编写mapper

```java
package cn.itcast.mp.mapper;

import cn.itcast.mp.pojo.User;
import com.baomidou.mybatisplus.core.mapper.BaseMapper;

public interface UserMapper extends BaseMapper<User> {
}

```

### 2.5.6、编写启动类

```java
package cn.itcast.mp;

import org.mybatis.spring.annotation.MapperScan;
import org.springframework.boot.SpringApplication;
import org.springframework.boot.WebApplicationType;
import org.springframework.boot.autoconfigure.SpringBootApplication;
import org.springframework.boot.builder.SpringApplicationBuilder;

@MapperScan("cn.itcast.mp.mapper") //设置mapper接口的扫描包
@SpringBootApplication
public class MyApplication {

    public static void main(String[] args) {
        SpringApplication.run(MyApplication.class, args);
    }

}
```

### 2.5.7、编写测试用例

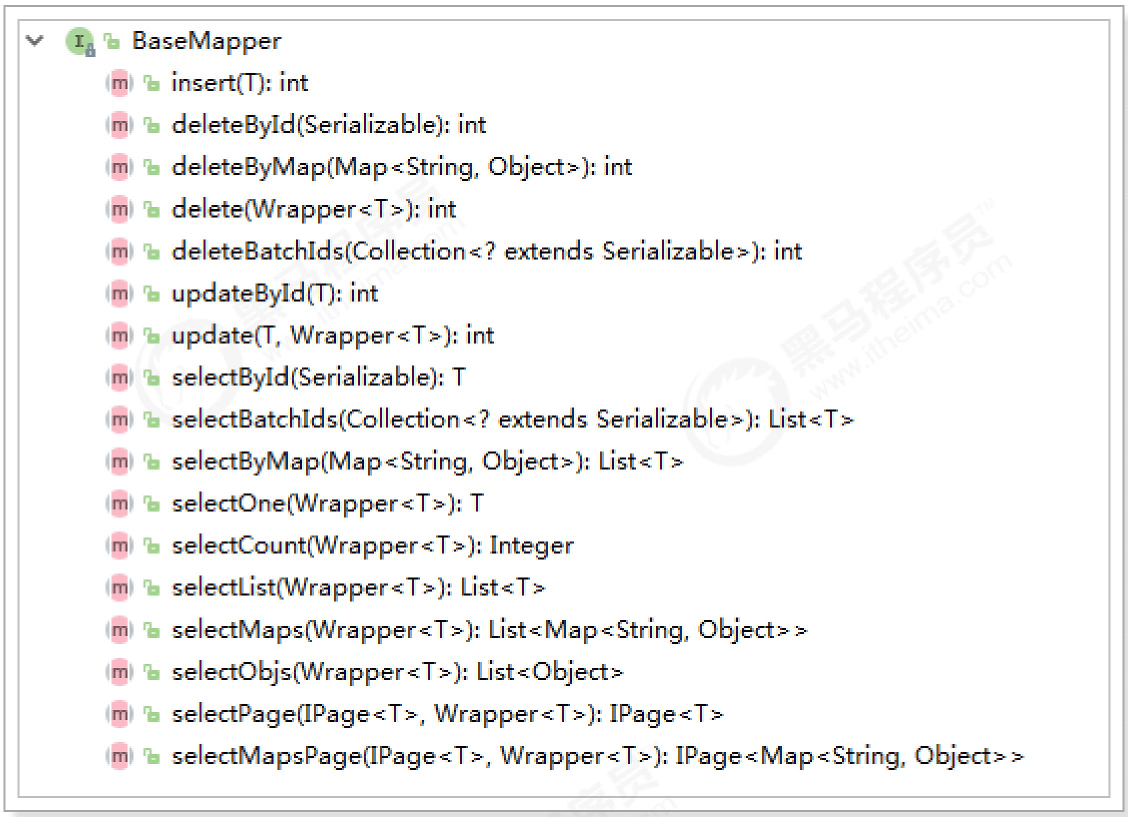
```java
package cn.itcast.mp;

import cn.itcast.mp.mapper.UserMapper;
import cn.itcast.mp.pojo.User;
import org.junit.Test;
import org.junit.runner.RunWith;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.test.context.SpringBootTest;
import org.springframework.test.context.junit4.SpringRunner;

import java.util.List;

@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testSelect() {
        List<User> userList = userMapper.selectList(null);
        for (User user : userList) {
            System.out.println(user);
        }
    }

}
```

测试：

```
[main] [cn.itcast.mp.mapper.UserMapper.selectList]-[DEBUG] ==>  Preparing: SELECT id,user_name,password,name,age,email FROM tb_user
[main] [cn.itcast.mp.mapper.UserMapper.selectList]-[DEBUG] ==> Parameters: 
[main] [cn.itcast.mp.mapper.UserMapper.selectList]-[DEBUG] <==      Total: 5
[main] [org.mybatis.spring.SqlSessionUtils]-[DEBUG] Closing non transactional SqlSession [org.apache.ibatis.session.defaults.DefaultSqlSession@14faa38c]
User(id=1, userName=zhangsan, password=123456, name=张三, age=18, email=test1@itcast.cn)
User(id=2, userName=lisi, password=123456, name=李四, age=20, email=test2@itcast.cn)
User(id=3, userName=wangwu, password=123456, name=王五, age=28, email=test3@itcast.cn)
User(id=4, userName=zhaoliu, password=123456, name=赵六, age=21, email=test4@itcast.cn)
User(id=5, userName=sunqi, password=123456, name=孙七, age=24, email=test5@itcast.cn)
```

## 3、通用CRUD

通过前面的学习，我们了解到通过继承BaseMapper就可以获取到各种各样的单表操作，接下来我们将详细讲解这些操作。



```
BaseMapper
    insert(T): int
    deleteById(Serializable): int
    deleteByMap(Map<String, Object>): int
    delete(Wrapper<T>): int
    deleteBatchIds(Collection<? extends Serializable>): int
    updateById(T): int
    update(T, Wrapper<T>): int
    selectById(Serializable): T
    selectBatchIds(Collection<? extends Serializable>): List<T>
    selectByMap(Map<String, Object>): List<T>
    selectOne(Wrapper<T>): T
    selectCount(Wrapper<T>): Integer
    selectList(Wrapper<T>): List<T>
    selectMaps(Wrapper<T>): List<Map<String, Object>>
    selectObjs(Wrapper<T>): List<Object>
    selectPage(IPage<T>, Wrapper<T>): IPage<T>
    selectMapsPage(IPage<T>, Wrapper<T>): IPage<Map<String, Object>>
```

### 3.1、插入操作

#### 3.1.1、方法定义

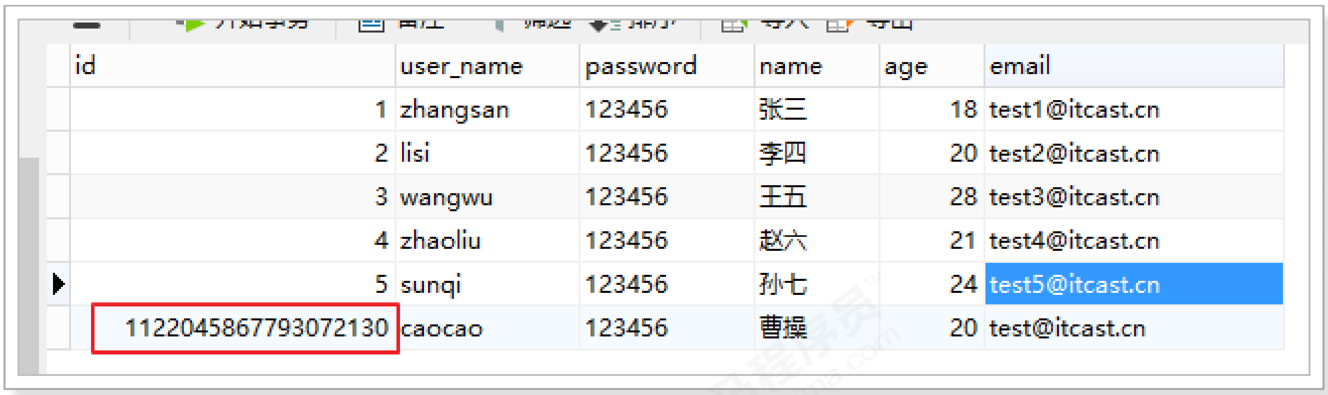
```
    /**
     * 插入一条记录
     *
     * @param entity 实体对象
     */
    int insert(T entity);
```

### 3.1.2、测试用例

```java
package cn.itcast.mp;

import cn.itcast.mp.mapper.UserMapper;
import cn.itcast.mp.pojo.User;
import org.junit.Test;
import org.junit.runner.RunWith;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.test.context.SpringBootTest;
import org.springframework.test.context.junit4.SpringRunner;

import java.util.List;

@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testInsert(){
        User user = new User();
        user.setAge(20);
        user.setEmail("test@itcast.cn");
        user.setName("曹操");
        user.setUserName("caocao");
        user.setPassword("123456");

        int result = this.userMapper.insert(user); //返回的result是受影响的行数，并不是自增后的id
        System.out.println("result = " + result);

        System.out.println(user.getId()); //自增后的id会回填到对象中
    }

}
```

### 3.1.3、测试

```
[main] [cn.itcast.mp.mapper.UserMapper.insert]-[DEBUG] ==>  Preparing: INSERT INTO tb_user ( id, user_name, password, name, age, email ) VALUES ( ?, ?, ?, ?, ?, ? )
[main] [cn.itcast.mp.mapper.UserMapper.insert]-[DEBUG] ==> Parameters: 1122045867793072130(Long), caocao(String), 123456(String), 曹操(String), 20(Integer), test@itcast.cn(String)
[main] [cn.itcast.mp.mapper.UserMapper.insert]-[DEBUG] <==    Updates: 1
[main] [org.mybatis.spring.SqlSessionUtils]-[DEBUG] Closing non transactional SqlSession [org.apache.ibatis.session.defaults.DefaultSqlSession@411291e5]
result = 1
1122045867793072130
```



| id | user_name | password | name | age | email |
|---|---|---|---|---|---|
| 1 | zhangsan | 123456 | 张三 | 18 | test1@itcast.cn |
| 2 | lisi | 123456 | 李四 | 20 | test2@itcast.cn |
| 3 | wangwu | 123456 | 王五 | 28 | test3@itcast.cn |
| 4 | zhaoliu | 123456 | 赵六 | 21 | test4@itcast.cn |
| 5 | sunqi | 123456 | 孙七 | 24 | test5@itcast.cn |
| 1122045867793072130 | caocao | 123456 | 曹操 | 20 | test@itcast.cn |

可以看到，数据已经写入到了数据库，但是，id的值不正确，我们期望的是数据库自增长，实际是MP生成了id的值写入到了数据库。

如何设置id的生成策略呢？

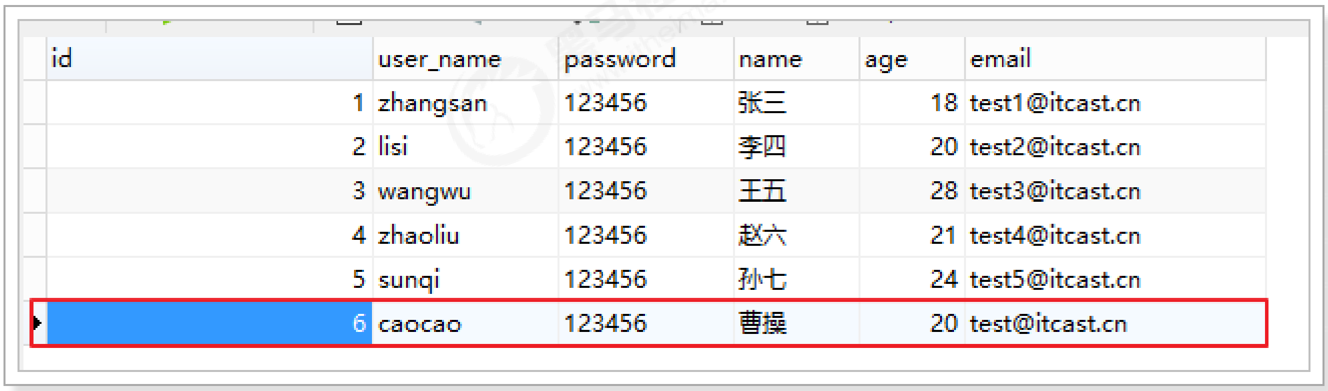
MP支持的id策略：

```java
package com.baomidou.mybatisplus.annotation;

import lombok.Getter;

/**
 * 生成ID类型枚举类
 *
 * @author hubin
 * @since 2015-11-10
 */
@Getter
public enum IdType {
    /**
     * 数据库ID自增
     */
    AUTO(0),
    /**
     * 该类型为未设置主键类型
     */
    NONE(1),
    /**
     * 用户输入ID
     * <p>该类型可以通过自己注册自动填充插件进行填充</p>
     */
    INPUT(2),

    /* 以下3种类型、只有当插入对象ID 为空，才自动填充。 */
    /**
     * 全局唯一ID (idWorker)
     */
    ID_WORKER(3),
    /**
     * 全局唯一ID (UUID)
     */
    UUID(4),
    /**
     * 字符串全局唯一ID (idworker 的字符串表示)
     */
    ID_WORKER_STR(5);

    private final int key;

    IdType(int key) {
        this.key = key;
    }
}

```

修改User对象：

```java
package cn.itcast.mp.pojo;

import com.baomidou.mybatisplus.annotation.IdType;
import com.baomidou.mybatisplus.annotation.TableId;
import com.baomidou.mybatisplus.annotation.TableName;
import lombok.AllArgsConstructor;
import lombok.Data;
import lombok.NoArgsConstructor;

@Data
@NoArgsConstructor
@AllArgsConstructor
@TableName("tb_user")
public class User {

    @TableId(type = IdType.AUTO) //指定id类型为自增长
    private Long id;
    private String userName;
    private String password;
    private String name;
    private Integer age;
    private String email;
}
```

数据插入成功：



| id | user_name | password | name | age | email |
|---|---|---|---|---|---|
| 1 | zhangsan | 123456 | 张三 | 18 | test1@itcast.cn |
| 2 | lisi | 123456 | 李四 | 20 | test2@itcast.cn |
| 3 | wangwu | 123456 | 王五 | 28 | test3@itcast.cn |
| 4 | zhaoliu | 123456 | 赵六 | 21 | test4@itcast.cn |
| 5 | sunqi | 123456 | 孙七 | 24 | test5@itcast.cn |
| 6 | caocao | 123456 | 曹操 | 20 | test@itcast.cn |

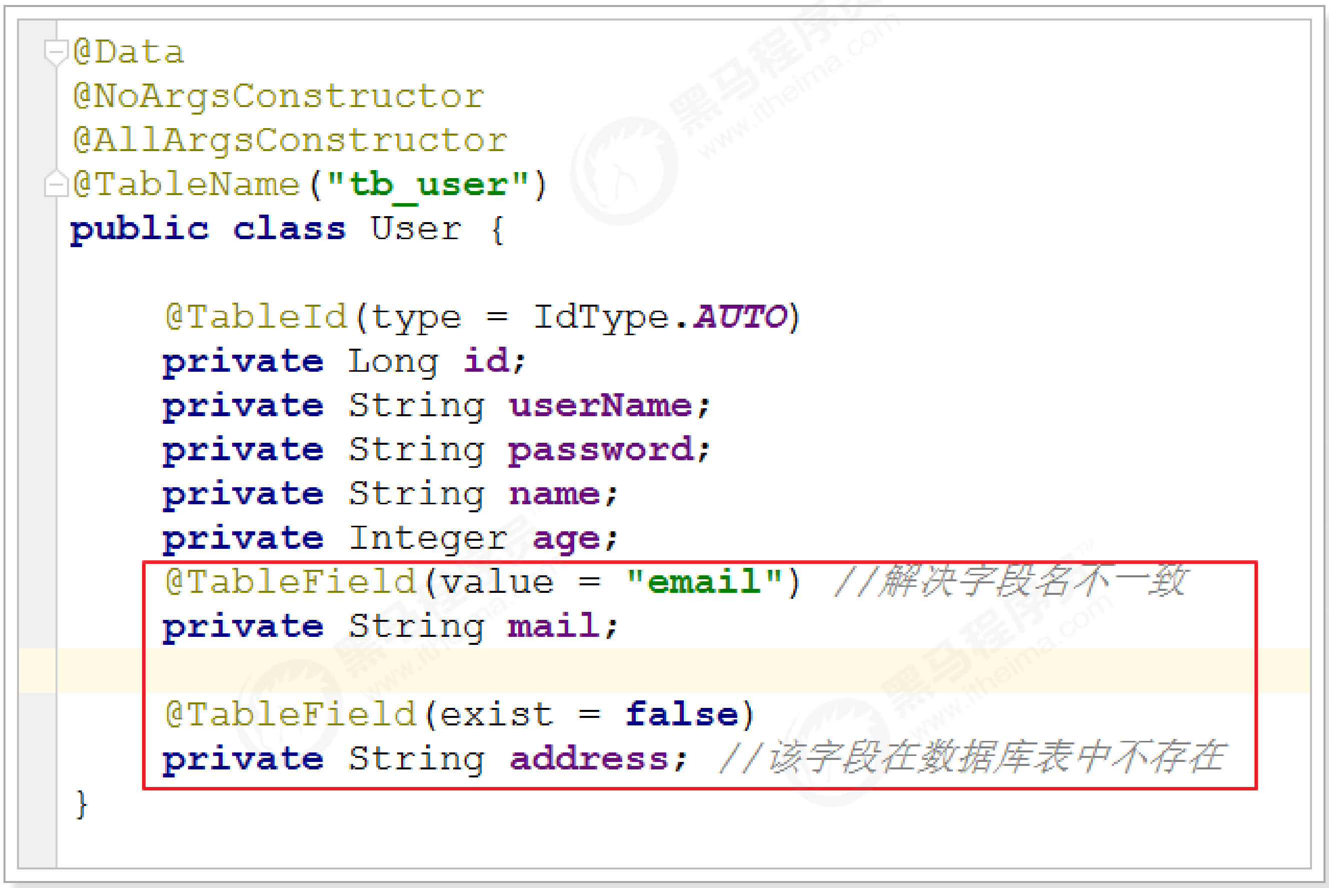
### 3.1.4、@TableField

在MP中通过@TableField注解可以指定字段的一些属性，常常解决的问题有2个：

1、对象中的属性名和字段名不一致的问题（非驼峰）

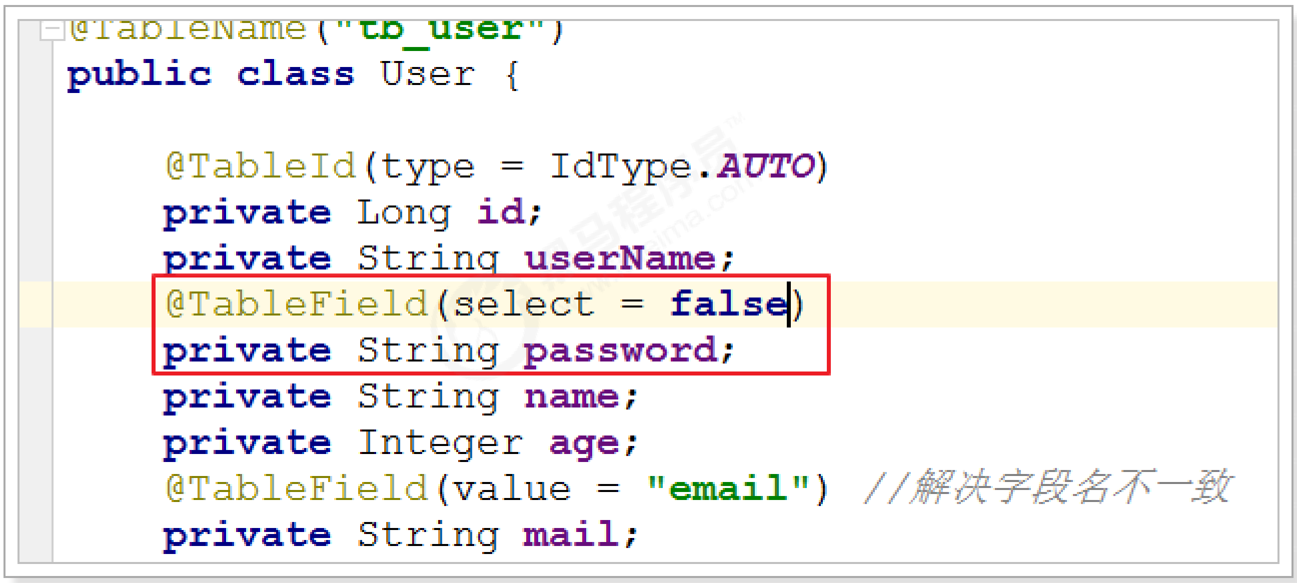
2、对象中的属性字段在表中不存在的问题

使用：



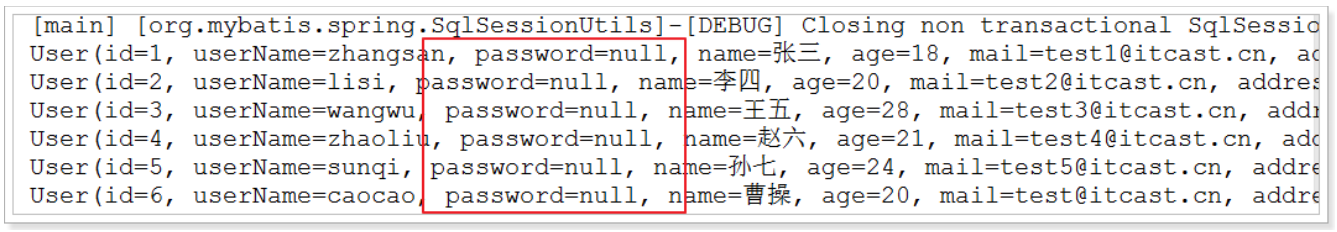
```java
@Data
@NoArgsConstructor
@AllArgsConstructor
@TableName("tb_user")
public class User {

    @TableId(type = IdType.AUTO)
    private Long id;
    private String userName;
    private String password;
    private String name;
    private Integer age;
    @TableField(value = "email") //解决字段名不一致
    private String mail;

    @TableField(exist = false)
    private String address; //该字段在数据库表中不存在
}
```

其他用法，如大字段不加入查询字段：



```java
@TableName("tb_user")
public class User {

    @TableId(type = IdType.AUTO)
    private Long id;
    private String userName;
    @TableField(select = false)
    private String password;
    private String name;
    private Integer age;
    @TableField(value = "email") //解决字段名不一致
    private String mail;
```

效果：



```
[main] [org.mybatis.spring.SqlSessionUtils]-[DEBUG] Closing non transactional SqlSessio
User(id=1, userName=zhangsan, password=null, name=张三, age=18, mail=test1@itcast.cn, ac
User(id=2, userName=lisi, password=null, name=李四, age=20, mail=test2@itcast.cn, addres
User(id=3, userName=wangwu, password=null, name=王五, age=28, mail=test3@itcast.cn, addr
User(id=4, userName=zhaoliu, password=null, name=赵六, age=21, mail=test4@itcast.cn, adc
User(id=5, userName=sunqi, password=null, name=孙七, age=24, mail=test5@itcast.cn, addre
User(id=6, userName=caocao, password=null, name=曹操, age=20, mail=test@itcast.cn, addre
```

## 3.2、更新操作

在MP中，更新操作有2种，一种是根据id更新，另一种是根据条件更新。

### 3.2.1、根据id更新

方法定义：

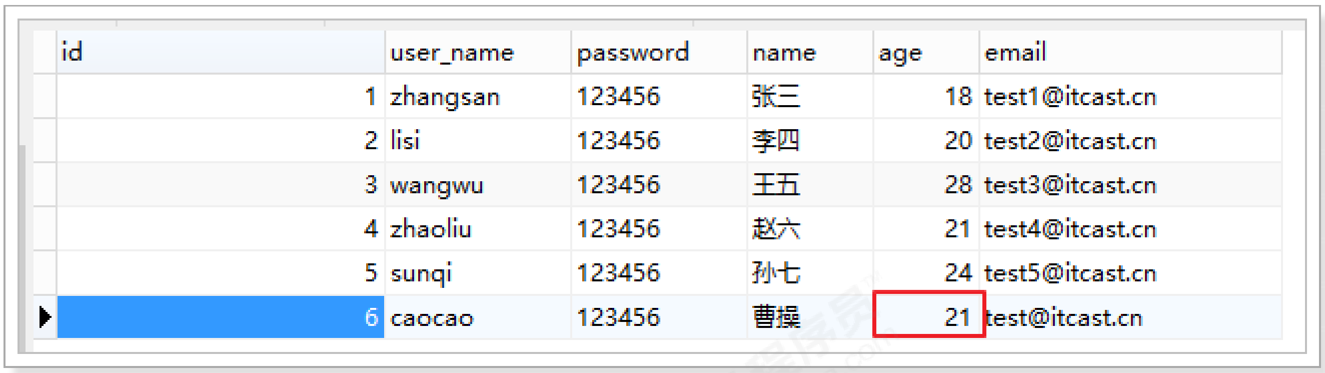
```java
    /**
     * 根据 ID 修改
     *
     * @param entity 实体对象
     */
    int updateById(@Param(Constants.ENTITY) T entity);
```

测试：

```java
@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testUpdateById() {
        User user = new User();
        user.setId(6L); //主键
        user.setAge(21); //更新的字段

        //根据id更新，更新不为null的字段
        this.userMapper.updateById(user);
    }

}
```

结果：

```
[main] [cn.itcast.mp.mapper.UserMapper.updateById]-[DEBUG] ==>  Preparing: UPDATE tb_user SET age=? WHERE id=?
[main] [cn.itcast.mp.mapper.UserMapper.updateById]-[DEBUG] ==> Parameters: 21(Integer), 6(Long)
[main] [cn.itcast.mp.mapper.UserMapper.updateById]-[DEBUG] <==    Updates: 1
```



| id | user_name | password | name | age | email |
|---|---|---|---|---|---|
| 1 | zhangsan | 123456 | 张三 | 18 | test1@itcast.cn |
| 2 | lisi | 123456 | 李四 | 20 | test2@itcast.cn |
| 3 | wangwu | 123456 | 王五 | 28 | test3@itcast.cn |
| 4 | zhaoliu | 123456 | 赵六 | 21 | test4@itcast.cn |
| 5 | sunqi | 123456 | 孙七 | 24 | test5@itcast.cn |
| 6 | caocao | 123456 | 曹操 | 21 | test@itcast.cn |

## 3.2.2、根据条件更新

方法定义：

```java
    /**
     * 根据 whereEntity 条件，更新记录
     *
     * @param entity        实体对象 (set 条件值,可以为 null)
     * @param updateWrapper 实体对象封装操作类（可以为 null,里面的 entity 用于生成 where 语句）
     */
    int update(@Param(Constants.ENTITY) T entity, @Param(Constants.WRAPPER) Wrapper<T>
updateWrapper);

```

测试用例：

```java
package cn.itcast.mp;

import cn.itcast.mp.mapper.UserMapper;
import cn.itcast.mp.pojo.User;
import com.baomidou.mybatisplus.core.conditions.Wrapper;
import com.baomidou.mybatisplus.core.conditions.query.QueryWrapper;
import com.baomidou.mybatisplus.core.conditions.update.UpdateWrapper;
import net.minidev.json.writer.UpdaterMapper;
import org.junit.Test;
import org.junit.runner.RunWith;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.test.context.SpringBootTest;
import org.springframework.test.context.junit4.SpringRunner;

import java.util.List;

@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testUpdate() {
        User user = new User();
        user.setAge(22); //更新的字段

        //更新的条件
        QueryWrapper<User> wrapper = new QueryWrapper<>();
        wrapper.eq("id", 6);

        //执行更新操作
        int result = this.userMapper.update(user, wrapper);
        System.out.println("result = " + result);
    }

}
```

或者，通过UpdateWrapper进行更新：

```java
    @Test
    public void testUpdate() {
        //更新的条件以及字段
        UpdateWrapper<User> wrapper = new UpdateWrapper<>();
        wrapper.eq("id", 6).set("age", 23);

        //执行更新操作
        int result = this.userMapper.update(null, wrapper);
        System.out.println("result = " + result);
    }
```

测试结果：

```
[main] [cn.itcast.mp.mapper.UserMapper.update]-[DEBUG] ==>  Preparing: UPDATE tb_user SET age=? WHERE id = ?
[main] [cn.itcast.mp.mapper.UserMapper.update]-[DEBUG] ==> Parameters: 23(Integer), 6(Integer)
[main] [cn.itcast.mp.mapper.UserMapper.update]-[DEBUG] <==    Updates: 1
```

均可达到更新的效果。

关于wrapper更多的用法后面会详细讲解。

## 3.3、删除操作

### 3.3.1、deleteById

方法定义：

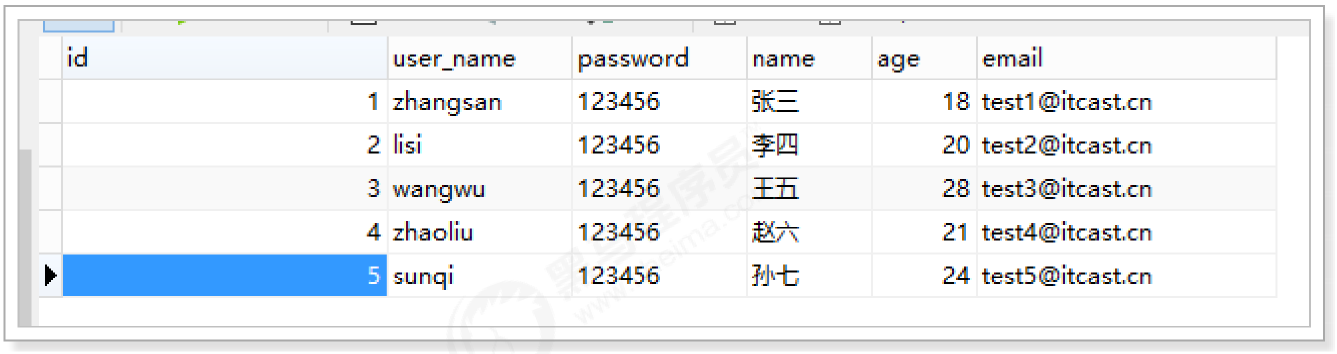
```java
/**
 * 根据 ID 删除
 *
 * @param id 主键ID
 */
int deleteById(Serializable id);
```

测试用例：

```java
package cn.itcast.mp;

import cn.itcast.mp.mapper.UserMapper;
import org.junit.Test;
import org.junit.runner.RunWith;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.test.context.SpringBootTest;
import org.springframework.test.context.junit4.SpringRunner;

@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testDeleteById() {
        //执行删除操作
        int result = this.userMapper.deleteById(6L);
        System.out.println("result = " + result);
    }

}
```

结果：

```
[main] [cn.itcast.mp.mapper.UserMapper.deleteById]-[DEBUG] ==>  Preparing: DELETE FROM tb_user WHERE id=?
[main] [cn.itcast.mp.mapper.UserMapper.deleteById]-[DEBUG] ==> Parameters: 6(Long)
[main] [cn.itcast.mp.mapper.UserMapper.deleteById]-[DEBUG] <==    Updates: 1
```



| id | user_name | password | name | age | email |
|---|---|---|---|---|---|
| 1 | zhangsan | 123456 | 张三 | 18 | test1@itcast.cn |
| 2 | lisi | 123456 | 李四 | 20 | test2@itcast.cn |
| 3 | wangwu | 123456 | 王五 | 28 | test3@itcast.cn |
| 4 | zhaoliu | 123456 | 赵六 | 21 | test4@itcast.cn |
| 5 | sunqi | 123456 | 孙七 | 24 | test5@itcast.cn |

数据被删除。

### 3.3.2、deleteByMap

方法定义：

```java
    /**
     * 根据 columnMap 条件，删除记录
     *
     * @param columnMap 表字段 map 对象
     */
    int deleteByMap(@Param(Constants.COLUMN_MAP) Map<String, Object> columnMap);
```

测试用例：

```java
package cn.itcast.mp;

import cn.itcast.mp.mapper.UserMapper;
import org.junit.Test;
import org.junit.runner.RunWith;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.test.context.SpringBootTest;
import org.springframework.test.context.junit4.SpringRunner;

import java.util.HashMap;
import java.util.Map;

@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testDeleteByMap() {
        Map<String, Object> columnMap = new HashMap<>();
        columnMap.put("age",20);
        columnMap.put("name","张三");

        //将columnMap中的元素设置为删除的条件，多个之间为and关系
        int result = this.userMapper.deleteByMap(columnMap);
        System.out.println("result = " + result);
    }

}
```

结果：

```
[main] [cn.itcast.mp.mapper.UserMapper.deleteByMap]-[DEBUG] ==>  Preparing: DELETE FROM tb_user WHERE name = ? AND age = ?
[main] [cn.itcast.mp.mapper.UserMapper.deleteByMap]-[DEBUG] ==> Parameters: 张三(String), 20(Integer)
[main] [cn.itcast.mp.mapper.UserMapper.deleteByMap]-[DEBUG] <==    Updates: 0
```

### 3.3.3、delete

方法定义：

```
/**
 * 根据 entity 条件，删除记录
 *
 * @param wrapper 实体对象封装操作类（可以为 null）
 */
int delete(@Param(Constants.WRAPPER) Wrapper<T> wrapper);
```

测试用例：

```
package cn.itcast.mp;

import cn.itcast.mp.mapper.UserMapper;
import cn.itcast.mp.pojo.User;
import com.baomidou.mybatisplus.core.conditions.query.QueryWrapper;
import org.junit.Test;
import org.junit.runner.RunWith;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.test.context.SpringBootTest;
import org.springframework.test.context.junit4.SpringRunner;

import java.util.HashMap;
import java.util.Map;

@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testDeleteByMap() {
        User user = new User();
        user.setAge(20);
        user.setName("张三");

        //将实体对象进行包装，包装为操作条件
        QueryWrapper<User> wrapper = new QueryWrapper<>(user);

        int result = this.userMapper.delete(wrapper);
        System.out.println("result = " + result);
    }

}
```

结果：

```
[main] [cn.itcast.mp.mapper.UserMapper.delete]-[DEBUG] ==>  Preparing: DELETE FROM tb_user WHERE name=? AND age=?
[main] [cn.itcast.mp.mapper.UserMapper.delete]-[DEBUG] ==> Parameters: 张三(String), 20(Integer)
[main] [cn.itcast.mp.mapper.UserMapper.delete]-[DEBUG] <==    Updates: 0
```

### 3.3.4、deleteBatchIds

方法定义：

```java
    /**
     * 删除（根据ID 批量删除）
     *
     * @param idList 主键ID列表(不能为 null 以及 empty)
     */
    int deleteBatchIds(@Param(Constants.COLLECTION) Collection<? extends Serializable> idList);
```

测试用例：

```java
package cn.itcast.mp;

import cn.itcast.mp.mapper.UserMapper;
import org.junit.Test;
import org.junit.runner.RunWith;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.test.context.SpringBootTest;
import org.springframework.test.context.junit4.SpringRunner;

import java.util.Arrays;

@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testDeleteByMap() {
        //根据id集合批量删除
        int result = this.userMapper.deleteBatchIds(Arrays.asList(1L,10L,20L));
        System.out.println("result = " + result);
    }

}
```

结果：

```
[main] [cn.itcast.mp.mapper.UserMapper.deleteBatchIds]-[DEBUG] ==>  Preparing: DELETE FROM tb_user WHERE id IN ( ? , ? , ? )
[main] [cn.itcast.mp.mapper.UserMapper.deleteBatchIds]-[DEBUG] ==> Parameters: 1(Long), 10(Long), 20(Long)
[main] [cn.itcast.mp.mapper.UserMapper.deleteBatchIds]-[DEBUG] <==    Updates: 1
```

## 3.4、查询操作

MP提供了多种查询操作，包括根据id查询、批量查询、查询单条数据、查询列表、分页查询等操作。

### 3.4.1、selectById

方法定义：

```
    /**
     * 根据 ID 查询
     *
     * @param id 主键ID
     */
    T selectById(Serializable id);
```

测试用例：

```java
package cn.itcast.mp;

import cn.itcast.mp.mapper.UserMapper;
import cn.itcast.mp.pojo.User;
import org.junit.Test;
import org.junit.runner.RunWith;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.test.context.SpringBootTest;
import org.springframework.test.context.junit4.SpringRunner;

@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testSelectById() {
        //根据id查询数据
        User user = this.userMapper.selectById(2L);
        System.out.println("result = " + user);
    }

}
```

结果：

```
[main] [cn.itcast.mp.mapper.UserMapper.selectById]-[DEBUG] ==>  Preparing: SELECT id,user_name,password,name,age,email FROM tb_user WHERE id=?
[main] [cn.itcast.mp.mapper.UserMapper.selectById]-[DEBUG] ==> Parameters: 2(Long)
[main] [cn.itcast.mp.mapper.UserMapper.selectById]-[DEBUG] <==      Total: 1

result = User(id=2, userName=lisi, password=123456, name=李四, age=20, email=test2@itcast.cn, address=null)
```

### 3.4.2、selectBatchIds

方法定义：

```
/**
 * 查询（根据ID 批量查询）
 *
 * @param idList 主键ID列表(不能为 null 以及 empty)
 */
List<T> selectBatchIds(@Param(Constants.COLLECTION) Collection<? extends Serializable> idList);
```

测试用例：

```
package cn.itcast.mp;

import cn.itcast.mp.mapper.UserMapper;
import cn.itcast.mp.pojo.User;
import org.junit.Test;
import org.junit.runner.RunWith;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.test.context.SpringBootTest;
import org.springframework.test.context.junit4.SpringRunner;

import java.util.Arrays;
import java.util.List;

@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testSelectBatchIds() {
        //根据id集合批量查询
        List<User> users = this.userMapper.selectBatchIds(Arrays.asList(2L, 3L, 10L));
        for (User user : users) {
            System.out.println(user);
        }
    }

}
```

结果：

```
[main] [cn.itcast.mp.mapper.UserMapper.selectBatchIds]-[DEBUG] ==>  Preparing: SELECT id,user_name,password,name,age,email FROM tb_user WHERE id IN ( ? , ? , ? )
[main] [cn.itcast.mp.mapper.UserMapper.selectBatchIds]-[DEBUG] ==> Parameters: 2(Long), 3(Long), 10(Long)
[main] [cn.itcast.mp.mapper.UserMapper.selectBatchIds]-[DEBUG] <==      Total: 2

User(id=2, userName=lisi, password=123456, name=李四, age=20, email=test2@itcast.cn, address=null)
User(id=3, userName=wangwu, password=123456, name=王五, age=28, email=test3@itcast.cn, address=null)
```

## 3.4.3、selectOne

方法定义：

```java
/**
 * 根据 entity 条件，查询一条记录
 *
 * @param queryWrapper 实体对象封装操作类（可以为 null）
 */
T selectOne(@Param(Constants.WRAPPER) Wrapper<T> queryWrapper);
```

测试用例：

```java
package cn.itcast.mp;

import cn.itcast.mp.mapper.UserMapper;
import cn.itcast.mp.pojo.User;
import com.baomidou.mybatisplus.core.conditions.query.QueryWrapper;
import org.junit.Test;
import org.junit.runner.RunWith;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.test.context.SpringBootTest;
import org.springframework.test.context.junit4.SpringRunner;

@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testSelectOne() {
        QueryWrapper<User> wrapper = new QueryWrapper<User>();
        wrapper.eq("name", "李四");

        //根据条件查询一条数据，如果结果超过一条会报错
        User user = this.userMapper.selectOne(wrapper);
```

```
            System.out.println(user);
        }

}
```

结果：

```
[main] [cn.itcast.mp.mapper.UserMapper.selectOne]-[DEBUG] ==>  Preparing: SELECT id,user_name,password,name,age,email FROM tb_user WHERE name = ?
[main] [cn.itcast.mp.mapper.UserMapper.selectOne]-[DEBUG] ==> Parameters: 李四(String)
[main] [cn.itcast.mp.mapper.UserMapper.selectOne]-[DEBUG] <==      Total: 1

User(id=2, userName=lisi, password=123456, name=李四, age=20, email=test2@itcast.cn, address=null)
```

### 3.4.4、selectCount

方法定义：

```
/**
 * 根据 Wrapper 条件，查询总记录数
 *
 * @param queryWrapper 实体对象封装操作类（可以为 null）
 */
Integer selectCount(@Param(Constants.WRAPPER) Wrapper<T> queryWrapper);
```

测试用例：

```
package cn.itcast.mp;

import cn.itcast.mp.mapper.UserMapper;
import cn.itcast.mp.pojo.User;
import com.baomidou.mybatisplus.core.conditions.query.QueryWrapper;
import org.junit.Test;
import org.junit.runner.RunWith;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.test.context.SpringBootTest;
import org.springframework.test.context.junit4.SpringRunner;

@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testSelectCount() {
        QueryWrapper<User> wrapper = new QueryWrapper<User>();
        wrapper.gt("age", 23); //年龄大于23岁

        //根据条件查询数据条数
        Integer count = this.userMapper.selectCount(wrapper);
        System.out.println("count = " + count);
    }

}
```

结果：

```
[main] [cn.itcast.mp.mapper.UserMapper.selectCount]-[DEBUG] ==>  Preparing: SELECT
COUNT( 1 ) FROM tb_user WHERE age > ?
[main] [cn.itcast.mp.mapper.UserMapper.selectCount]-[DEBUG] ==> Parameters: 23(Integer)
[main] [cn.itcast.mp.mapper.UserMapper.selectCount]-[DEBUG] <==      Total: 1

count = 2
```

### 3.4.5、selectList

方法定义：

```
/**
 * 根据 entity 条件，查询全部记录
 *
 * @param queryWrapper 实体对象封装操作类（可以为 null）
 */
List<T> selectList(@Param(Constants.WRAPPER) Wrapper<T> queryWrapper);
```

测试用例：

```
package cn.itcast.mp;

import cn.itcast.mp.mapper.UserMapper;
import cn.itcast.mp.pojo.User;
import com.baomidou.mybatisplus.core.conditions.query.QueryWrapper;
import org.junit.Test;
import org.junit.runner.RunWith;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.test.context.SpringBootTest;
import org.springframework.test.context.junit4.SpringRunner;

import java.util.List;

@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testSelectList() {
        QueryWrapper<User> wrapper = new QueryWrapper<User>();
        wrapper.gt("age", 23); //年龄大于23岁
```

```java

        //根据条件查询数据
        List<User> users = this.userMapper.selectList(wrapper);
        for (User user : users) {
            System.out.println("user = " + user);
        }
    }

}
```

结果：

```
[main] [cn.itcast.mp.mapper.UserMapper.selectList]-[DEBUG] ==>  Preparing: SELECT id,user_name,password,name,age,email FROM tb_user WHERE age > ?
[main] [cn.itcast.mp.mapper.UserMapper.selectList]-[DEBUG] ==> Parameters: 23(Integer)
[main] [cn.itcast.mp.mapper.UserMapper.selectList]-[DEBUG] <==      Total: 2

user = User(id=3, userName=wangwu, password=123456, name=王五, age=28, email=test3@itcast.cn, address=null)
user = User(id=5, userName=sunqi, password=123456, name=孙七, age=24, email=test5@itcast.cn, address=null)
```

### 3.4.6、selectPage

方法定义：

```java
/**
 * 根据 entity 条件，查询全部记录（并翻页）
 *
 * @param page         分页查询条件（可以为 RowBounds.DEFAULT）
 * @param queryWrapper 实体对象封装操作类（可以为 null）
 */
IPage<T> selectPage(IPage<T> page, @Param(Constants.WRAPPER) Wrapper<T> queryWrapper);
```

配置分页插件：

```java
package cn.itcast.mp;

import com.baomidou.mybatisplus.extension.plugins.PaginationInterceptor;
import org.mybatis.spring.annotation.MapperScan;
import org.springframework.context.annotation.Bean;
import org.springframework.context.annotation.Configuration;

@Configuration
@MapperScan("cn.itcast.mp.mapper") //设置mapper接口的扫描包
public class MybatisPlusConfig {

    /**
     * 分页插件
     */
    @Bean
    public PaginationInterceptor paginationInterceptor() {
        return new PaginationInterceptor();
    }
}
```

测试用例：

```
package cn.itcast.mp;

import cn.itcast.mp.mapper.UserMapper;
import cn.itcast.mp.pojo.User;
import com.baomidou.mybatisplus.core.conditions.query.QueryWrapper;
import com.baomidou.mybatisplus.core.metadata.IPage;
import com.baomidou.mybatisplus.extension.plugins.pagination.Page;
import org.junit.Test;
import org.junit.runner.RunWith;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.test.context.SpringBootTest;
import org.springframework.test.context.junit4.SpringRunner;

import java.util.List;

@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testSelectPage() {
        QueryWrapper<User> wrapper = new QueryWrapper<User>();
        wrapper.gt("age", 20); //年龄大于20岁

        Page<User> page = new Page<>(1,1);

        //根据条件查询数据
        IPage<User> iPage = this.userMapper.selectPage(page, wrapper);
        System.out.println("数据总条数：" + iPage.getTotal());
        System.out.println("总页数：" + iPage.getPages());


        List<User> users = iPage.getRecords();
        for (User user : users) {
            System.out.println("user = " + user);
        }
    }

}
```

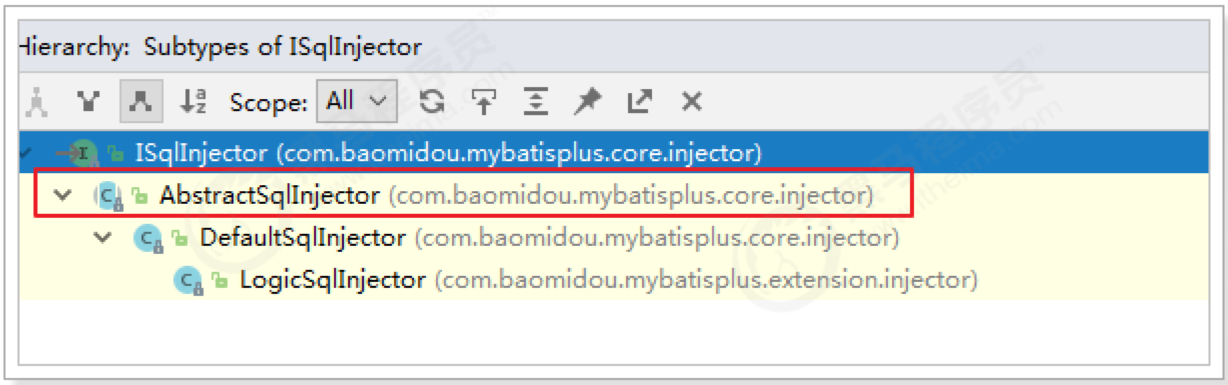
结果：

```
[main] [cn.itcast.mp.mapper.UserMapper.selectPage]-[DEBUG] ==>  Preparing: SELECT COUNT(1) FROM tb_user WHERE age > ?
[main] [cn.itcast.mp.mapper.UserMapper.selectPage]-[DEBUG] ==> Parameters: 20(Integer)
[main] [cn.itcast.mp.mapper.UserMapper.selectPage]-[DEBUG] ==>  Preparing: SELECT id,user_name,password,name,age,email FROM tb_user WHERE age > ? LIMIT ?,?
[main] [cn.itcast.mp.mapper.UserMapper.selectPage]-[DEBUG] ==> Parameters: 20(Integer), 0(Long), 1(Long)
[main] [cn.itcast.mp.mapper.UserMapper.selectPage]-[DEBUG] <==      Total: 1
[main] [org.mybatis.spring.SqlSessionUtils]-[DEBUG] Closing non transactional SqlSession [org.apache.ibatis.session.defaults.DefaultSqlSession@6ecd665]
数据总条数：3
总页数：3
user = User(id=3, userName=wangwu, password=123456, name=王五, age=28, email=test3@itcast.cn, address=null)
```

## 3.5、SQL注入的原理

前面我们已经知道，MP在启动后会将BaseMapper中的一系列的方法注册到meppedStatements中，那么究竟是如何注入的呢？流程又是怎么样的？下面我们将一起来分析下。

在MP中，ISqlInjector负责SQL的注入工作，它是一个接口，AbstractSqlInjector是它的实现类，实现关系如下：



ISqlInjector (com.baomidou.mybatisplus.core.injector)
AbstractSqlInjector (com.baomidou.mybatisplus.core.injector)
DefaultSqlInjector (com.baomidou.mybatisplus.core.injector)
LogicSqlInjector (com.baomidou.mybatisplus.extension.injector)

在AbstractSqlInjector中，主要是由inspectInject()方法进行注入的，如下：

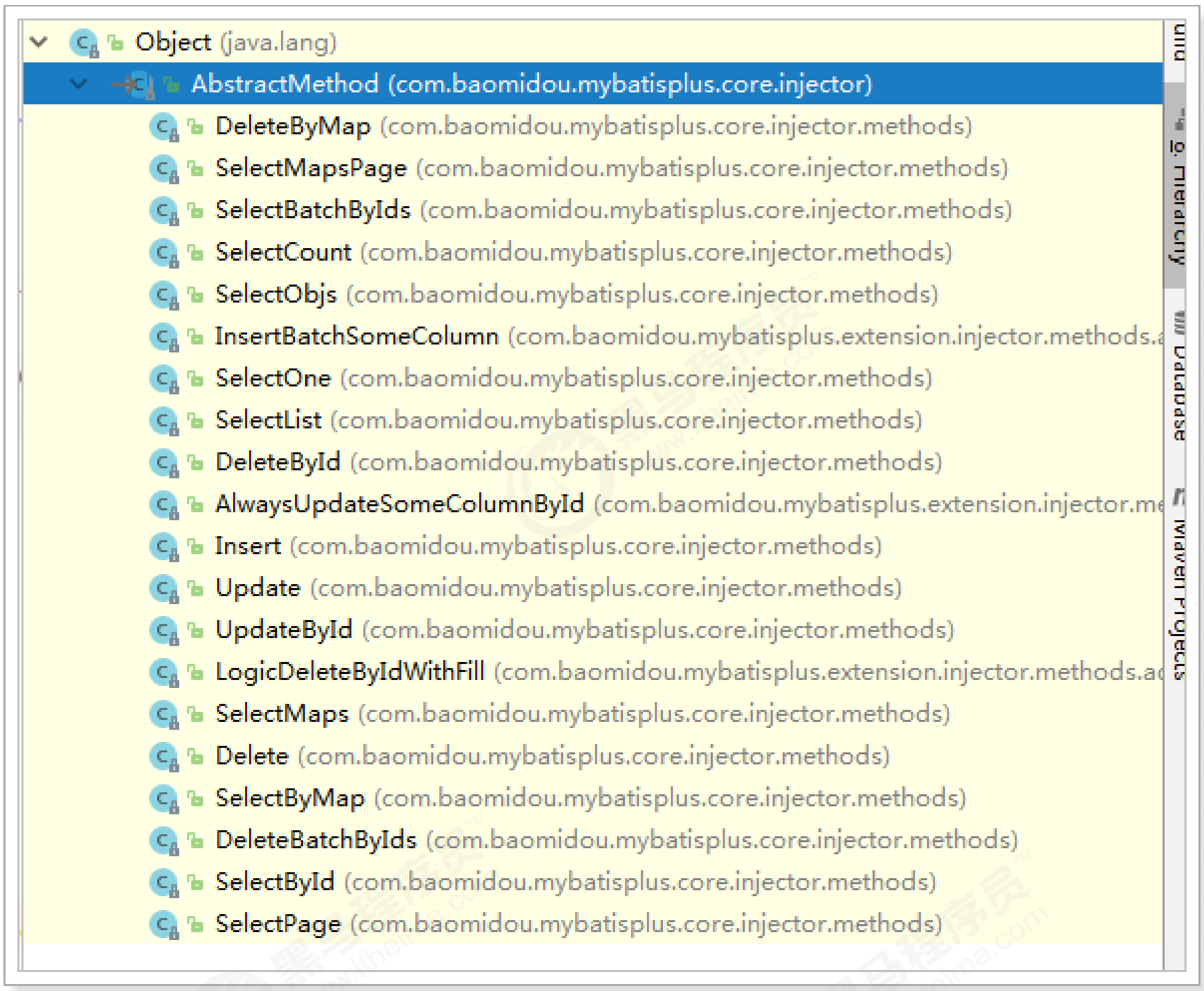
```java
@Override
public void inspectInject(MapperBuilderAssistant builderAssistant, Class<?> mapperClass) {
    Class<?> modelClass = extractModelClass(mapperClass);
    if (modelClass != null) {
        String className = mapperClass.toString();
        Set<String> mapperRegistryCache = GlobalConfigUtils.getMapperRegistryCache(builderAssistant.getConfiguration());
        if (!mapperRegistryCache.contains(className)) {
            List<AbstractMethod> methodList = this.getMethodList();
            if (CollectionUtils.isNotEmpty(methodList)) {
                TableInfo tableInfo = TableInfoHelper.initTableInfo(builderAssistant, modelClass);
                // 循环注入自定义方法
                methodList.forEach(m -> m.inject(builderAssistant, mapperClass, modelClass, tableInfo));
            } else {
                logger.debug(mapperClass.toString() + ", No effective injection method was found.");
            }
            mapperRegistryCache.add(className);
        }
    }
}
```

在实现方法中，`methodList.forEach(m -> m.inject(builderAssistant, mapperClass, modelClass, tableInfo));`是关键，循环遍历方法，进行注入。

最终调用抽象方法injectMappedStatement进行真正的注入：

```
    /**
     * 注入自定义 MappedStatement
     *
     * @param mapperClass mapper 接口
     * @param modelClass  mapper 泛型
     * @param tableInfo   数据库表反射信息
     * @return MappedStatement
     */
    public abstract MappedStatement injectMappedStatement(Class<?> mapperClass, Class<?> modelClass, TableInfo tableInfo);
```

查看该方法的实现：

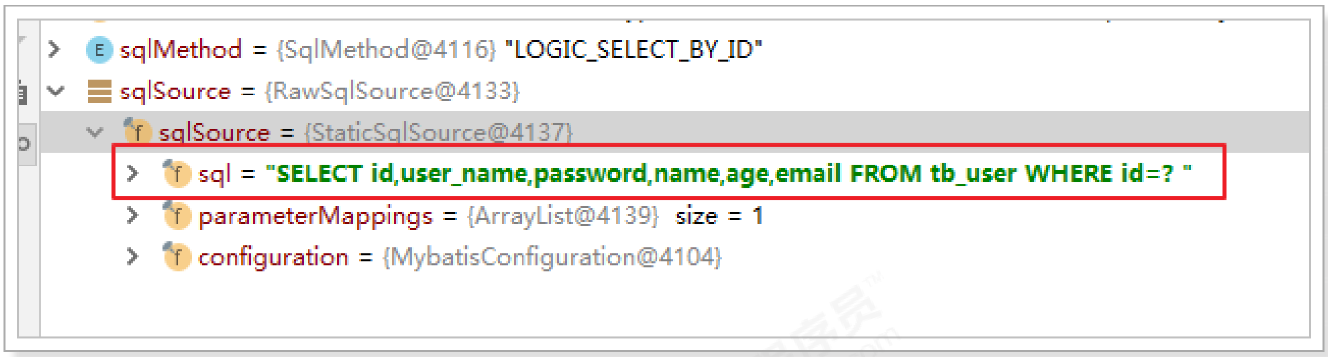


Object (java.lang)
AbstractMethod (com.baomidou.mybatisplus.core.injector)
DeleteByMap (com.baomidou.mybatisplus.core.injector.methods)
SelectMapsPage (com.baomidou.mybatisplus.core.injector.methods)
SelectBatchByIds (com.baomidou.mybatisplus.core.injector.methods)
SelectCount (com.baomidou.mybatisplus.core.injector.methods)
SelectObjs (com.baomidou.mybatisplus.core.injector.methods)
InsertBatchSomeColumn (com.baomidou.mybatisplus.extension.injector.methods.a
SelectOne (com.baomidou.mybatisplus.core.injector.methods)
SelectList (com.baomidou.mybatisplus.core.injector.methods)
DeleteById (com.baomidou.mybatisplus.core.injector.methods)
AlwaysUpdateSomeColumnById (com.baomidou.mybatisplus.extension.injector.me
Insert (com.baomidou.mybatisplus.core.injector.methods)
Update (com.baomidou.mybatisplus.core.injector.methods)
UpdateById (com.baomidou.mybatisplus.core.injector.methods)
LogicDeleteByIdWithFill (com.baomidou.mybatisplus.extension.injector.methods.ad
SelectMaps (com.baomidou.mybatisplus.core.injector.methods)
Delete (com.baomidou.mybatisplus.core.injector.methods)
SelectByMap (com.baomidou.mybatisplus.core.injector.methods)
DeleteBatchByIds (com.baomidou.mybatisplus.core.injector.methods)
SelectById (com.baomidou.mybatisplus.core.injector.methods)
SelectPage (com.baomidou.mybatisplus.core.injector.methods)

以SelectById为例查看：

```java
public class SelectById extends AbstractMethod {

    @Override
    public MappedStatement injectMappedStatement(Class<?> mapperClass, Class<?> modelClass, TableInfo tableInfo) {
        SqlMethod sqlMethod = SqlMethod.LOGIC_SELECT_BY_ID;
        SqlSource sqlSource = new RawSqlSource(configuration, String.format(sqlMethod.getSql(),
            sqlSelectColumns(tableInfo, false),
            tableInfo.getTableName(), tableInfo.getKeyColumn(), tableInfo.getKeyProperty(),
            tableInfo.getLogicDeleteSql(true, false)), Object.class);
        return this.addSelectMappedStatement(mapperClass, sqlMethod.getMethod(), sqlSource, modelClass, tableInfo);
    }
}
```

可以看到，生成了SqlSource对象，再将SQL通过addSelectMappedStatement方法添加到meppedStatements中。


```
> sqlMethod = {SqlMethod@4116} "LOGIC_SELECT_BY_ID"
v sqlSource = {RawSqlSource@4133}
  v sqlSource = {StaticSqlSource@4137}
    > sql = "SELECT id,user_name,password,name,age,email FROM tb_user WHERE id=? "
    > parameterMappings = {ArrayList@4139}  size = 1
    > configuration = {MybatisConfiguration@4104}
```

## 4、配置

在MP中有大量的配置，其中有一部分是Mybatis原生的配置，另一部分是MP的配置，详情：https://mybatis.plus/config/

下面我们对常用的配置做讲解。

### 4.1、基本配置

#### 4.1.1、configLocation

MyBatis 配置文件位置，如果您有单独的 MyBatis 配置，请将其路径配置到 configLocation 中。 MyBatis Configuration 的具体内容请参考MyBatis 官方文档

Spring Boot：

```
mybatis-plus.config-location = classpath:mybatis-config.xml
```

Spring MVC：

```
<bean id="sqlSessionFactory"
class="com.baomidou.mybatisplus.extension.spring.MybatisSqlSessionFactoryBean">
    <property name="configLocation" value="classpath:mybatis-config.xml"/>
</bean>
```

#### 4.1.2、mapperLocations

MyBatis Mapper 所对应的 XML 文件位置，如果您在 Mapper 中有自定义方法（XML 中有自定义实现），需要进行该配置，告诉 Mapper 所对应的 XML 文件位置。

Spring Boot：

```
mybatis-plus.mapper-locations = classpath*:mybatis/*.xml
```

Spring MVC：

```
<bean id="sqlSessionFactory"
class="com.baomidou.mybatisplus.extension.spring.MybatisSqlSessionFactoryBean">
    <property name="mapperLocations" value="classpath*:mybatis/*.xml"/>
</bean>
```

> Maven 多模块项目的扫描路径需以 `classpath*:` 开头（即加载多个 jar 包下的 XML 文件）

> 测试：

UserMapper.xml：

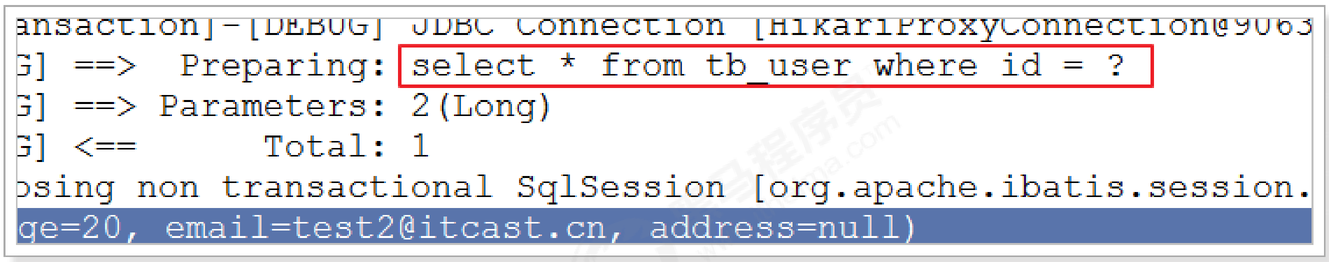
```xml
<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE mapper
        PUBLIC "-//mybatis.org//DTD Mapper 3.0//EN"
        "http://mybatis.org/dtd/mybatis-3-mapper.dtd">
<mapper namespace="cn.itcast.mp.mapper.UserMapper">

    <select id="findById" resultType="cn.itcast.mp.pojo.User">
      select * from tb_user where id = #{id}
    </select>

</mapper>
```

```java
package cn.itcast.mp.mapper;

import cn.itcast.mp.pojo.User;
import com.baomidou.mybatisplus.core.mapper.BaseMapper;

public interface UserMapper extends BaseMapper<User> {

    User findById(Long id);
}
```

测试用例：

```java
package cn.itcast.mp;

import cn.itcast.mp.mapper.UserMapper;
import cn.itcast.mp.pojo.User;
import org.junit.Test;
import org.junit.runner.RunWith;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.test.context.SpringBootTest;
import org.springframework.test.context.junit4.SpringRunner;

@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testSelectPage() {
        User user = this.userMapper.findById(2L);
        System.out.println(user);

    }

}
```

运行结果：



```
ansaction]-[DEBUG] JDBC Connection [HikariProxyConnection@9063
G] ==>  Preparing: select * from tb_user where id = ?
G] ==> Parameters: 2(Long)
G] <==      Total: 1
osing non transactional SqlSession [org.apache.ibatis.session.
ge=20, email=test2@itcast.cn, address=null)
```

### 4.1.3、typeAliasesPackage

MyBaits 别名包扫描路径，通过该属性可以给包中的类注册别名，注册后在 Mapper 对应的 XML 文件中可以直接使用类名，而不用使用全限定的类名（即 XML 中调用的时候不用包含包名）。

Spring Boot：

```
mybatis-plus.type-aliases-package = cn.itcast.mp.pojo
```

Spring MVC：

```
<bean id="sqlSessionFactory"
class="com.baomidou.mybatisplus.extension.spring.MybatisSqlSessionFactoryBean">
    <property name="typeAliasesPackage"
value="com.baomidou.mybatisplus.samples.quickstart.entity"/>
</bean>
```

## 4.2、进阶配置

本部分（Configuration）的配置大都为 MyBatis 原生支持的配置，这意味着您可以通过 MyBatis XML 配置文件的形式进行配置。

### 4.2.1、mapUnderscoreToCamelCase

- 类型：`boolean`
- 默认值：`true`

是否开启自动驼峰命名规则（camel case）映射，即从经典数据库列名 A_COLUMN（下划线命名） 到经典 Java 属性名 aColumn（驼峰命名） 的类似映射。

> 注意：
>
> 此属性在 MyBatis 中原默认值为 false，在 MyBatis-Plus 中，此属性也将用于生成最终的 SQL 的 select body
>
> 如果您的数据库命名符合规则无需使用 `@TableField` 注解指定数据库字段名

示例（SpringBoot）：

```
#关闭自动驼峰映射，该参数不能和mybatis-plus.config-location同时存在
mybatis-plus.configuration.map-underscore-to-camel-case=false
```

### 4.2.2、cacheEnabled

- 类型：`boolean`
- 默认值：`true`

全局地开启或关闭配置文件中的所有映射器已经配置的任何缓存，默认为 true。

示例：

```
mybatis-plus.configuration.cache-enabled=false
```

## 4.3、DB 策略配置

### 4.3.1、idType

- 类型：`com.baomidou.mybatisplus.annotation.IdType`
- 默认值：`ID_WORKER`

全局默认主键类型，设置后，即可省略实体对象中的@TableId(type = IdType.AUTO)配置。

示例：

SpringBoot：

```
mybatis-plus.global-config.db-config.id-type=auto
```

SpringMVC：

```
<!--这里使用MP提供的sqlSessionFactory，完成了Spring与MP的整合-->
    <bean id="sqlSessionFactory"
class="com.baomidou.mybatisplus.extension.spring.MybatisSqlSessionFactoryBean">
        <property name="dataSource" ref="dataSource"/>
        <property name="globalConfig">
            <bean class="com.baomidou.mybatisplus.core.config.GlobalConfig">
                <property name="dbConfig">
                    <bean
class="com.baomidou.mybatisplus.core.config.GlobalConfig$DbConfig">
                        <property name="idType" value="AUTO"/>
                    </bean>
                </property>
            </bean>
        </property>
    </bean>
```

### 4.3.2、tablePrefix

- 类型：`String`
- 默认值：`null`

表名前缀，全局配置后可省略@TableName()配置。

SpringBoot：

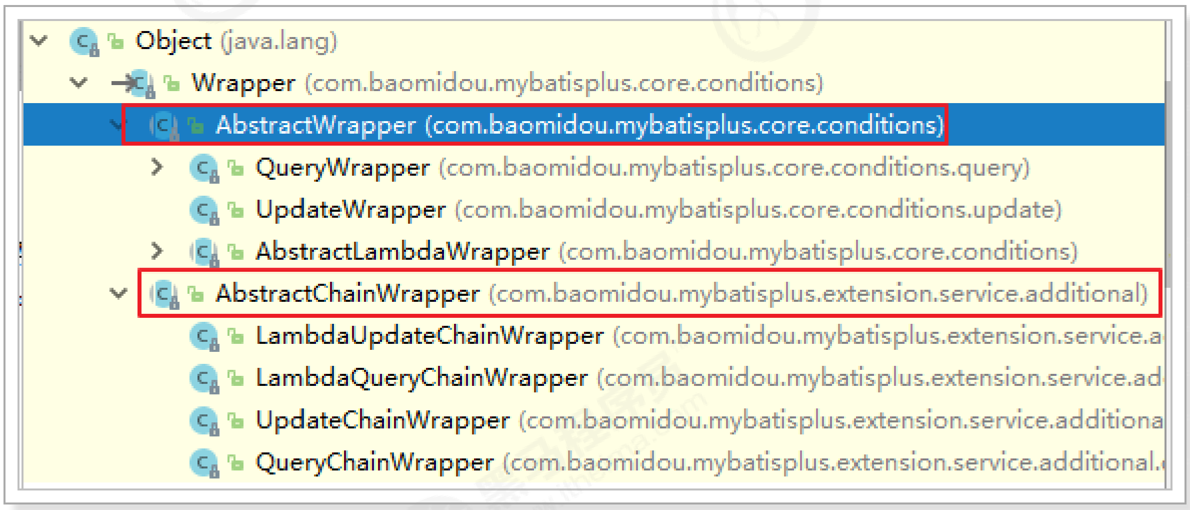
```
mybatis-plus.global-config.db-config.table-prefix=tb_
```

SpringMVC：

```
 <bean id="sqlSessionFactory"
class="com.baomidou.mybatisplus.extension.spring.MybatisSqlSessionFactoryBean">
        <property name="dataSource" ref="dataSource"/>
        <property name="globalConfig">
            <bean class="com.baomidou.mybatisplus.core.config.GlobalConfig">
                <property name="dbConfig">
                    <bean
class="com.baomidou.mybatisplus.core.config.GlobalConfig$DbConfig">
                        <property name="idType" value="AUTO"/>
                        <property name="tablePrefix" value="tb_"/>
                    </bean>
                </property>
            </bean>
        </property>
    </bean>
```

## 5、条件构造器

在MP中，Wrapper接口的实现类关系如下：



```
Object (java.lang)
  Wrapper (com.baomidou.mybatisplus.core.conditions)
    AbstractWrapper (com.baomidou.mybatisplus.core.conditions)
      QueryWrapper (com.baomidou.mybatisplus.core.conditions.query)
      UpdateWrapper (com.baomidou.mybatisplus.core.conditions.update)
      AbstractLambdaWrapper (com.baomidou.mybatisplus.core.conditions)
    AbstractChainWrapper (com.baomidou.mybatisplus.extension.service.additional)
      LambdaUpdateChainWrapper (com.baomidou.mybatisplus.extension.service.a
      LambdaQueryChainWrapper (com.baomidou.mybatisplus.extension.service.ad
      UpdateChainWrapper (com.baomidou.mybatisplus.extension.service.additiona
      QueryChainWrapper (com.baomidou.mybatisplus.extension.service.additional.
```

可以看到，AbstractWrapper和AbstractChainWrapper是重点实现，接下来我们重点学习AbstractWrapper以及其子类。

> 说明:
>
> QueryWrapper(LambdaQueryWrapper) 和 UpdateWrapper(LambdaUpdateWrapper) 的父类 用于生成 sql 的 where 条件, entity 属性也用于生成 sql 的 where 条件 注意: entity 生成的 where 条件与 使用各个 api 生成的 where 条件**没有任何关联行为**

官网文档地址：https://mybatis.plus/guide/wrapper.html

## 5.1、allEq

### 5.1.1、说明

```
allEq(Map<R, V> params)
allEq(Map<R, V> params, boolean null2IsNull)
allEq(boolean condition, Map<R, V> params, boolean null2IsNull)
```

- 全部eq(或个别isNull)

> 个别参数说明: `params` : `key`为数据库字段名,`value`为字段值 `null2IsNull` : 为`true`则在`map`的`value`为`null`时调用 isNull 方法,为`false`时则忽略`value`为`null`的
>
> - 例1: `allEq({id:1,name:"老王",age:null})`--->`id = 1 and name = '老王' and age is null`
> - 例2: `allEq({id:1,name:"老王",age:null}, false)`--->`id = 1 and name = '老王'`

```
allEq(BiPredicate<R, V> filter, Map<R, V> params)
allEq(BiPredicate<R, V> filter, Map<R, V> params, boolean null2IsNull)
allEq(boolean condition, BiPredicate<R, V> filter, Map<R, V> params, boolean
null2IsNull)
```

> 个别参数说明: `filter` : 过滤函数,是否允许字段传入比对条件中 `params` 与 `null2IsNull` : 同上
>
> - 例1: `allEq((k,v) -> k.indexOf("a") > 0, {id:1,name:"老王",age:null})`--->`name = '老王' and age is null`
> - 例2: `allEq((k,v) -> k.indexOf("a") > 0, {id:1,name:"老王",age:null}, false)`--->`name = '老王'`

### 5.1.2、测试用例

```java
package cn.itcast.mp;

import cn.itcast.mp.mapper.UserMapper;
import cn.itcast.mp.pojo.User;
import com.baomidou.mybatisplus.core.conditions.query.QueryWrapper;
import org.junit.Test;
import org.junit.runner.RunWith;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.test.context.SpringBootTest;
import org.springframework.test.context.junit4.SpringRunner;

import java.util.HashMap;
import java.util.List;
import java.util.Map;

@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testWrapper() {
        QueryWrapper<User> wrapper = new QueryWrapper<>();

        //设置条件
        Map<String,Object> params = new HashMap<>();
        params.put("name", "曹操");
        params.put("age", "20");
        params.put("password", null);

//        wrapper.allEq(params);//SELECT * FROM tb_user WHERE password IS NULL AND name = ? AND age = ?
//        wrapper.allEq(params,false); //SELECT * FROM tb_user WHERE name = ? AND age = ?

//        wrapper.allEq((k, v) -> (k.equals("name") || k.equals("age")) ,params);//SELECT * FROM tb_user WHERE name = ? AND age = ?

        List<User> users = this.userMapper.selectList(wrapper);
        for (User user : users) {
            System.out.println(user);
        }

    }

}
```

## 5.2、基本比较操作

- eq
  - 等于 =
- ne
  - 不等于 <>
- gt
  - 大于 >
- ge
  - 大于等于 >=
- lt
  - 小于 <
- le
  - 小于等于 <=
- between
  - BETWEEN 值1 AND 值2
- notBetween
  - NOT BETWEEN 值1 AND 值2
- in
  - 字段 IN (value.get(0), value.get(1), ...)

- notIn
    - 字段 NOT IN (v0, v1, ...)

测试用例：

```java
package cn.itcast.mp;

import cn.itcast.mp.mapper.UserMapper;
import cn.itcast.mp.pojo.User;
import com.baomidou.mybatisplus.core.conditions.query.QueryWrapper;
import org.junit.Test;
import org.junit.runner.RunWith;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.test.context.SpringBootTest;
import org.springframework.test.context.junit4.SpringRunner;

import java.util.List;

@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testEq() {
        QueryWrapper<User> wrapper = new QueryWrapper<>();

        //SELECT id,user_name,password,name,age,email FROM tb_user WHERE password = ? AND age >= ? AND name IN (?,?,?)
        wrapper.eq("password", "123456")
                .ge("age", 20)
                .in("name", "李四", "王五", "赵六");

        List<User> users = this.userMapper.selectList(wrapper);
        for (User user : users) {
            System.out.println(user);
        }

    }

}
```

## 5.3、模糊查询

- like
    - LIKE '%值%'
    - 例: `like("name", "王")`--->`name like '%王%'`
- notLike
    - NOT LIKE '%值%'

    - 例: `notLike("name", "王")`---> `name not like '%王%'`
- likeLeft
    - LIKE '%值'
    - 例: `likeLeft("name", "王")`---> `name like '%王'`
- likeRight
    - LIKE '值%'
    - 例: `likeRight("name", "王")`---> `name like '王%'`

测试用例：

```java
package cn.itcast.mp;

import cn.itcast.mp.mapper.UserMapper;
import cn.itcast.mp.pojo.User;
import com.baomidou.mybatisplus.core.conditions.query.QueryWrapper;
import org.junit.Test;
import org.junit.runner.RunWith;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.test.context.SpringBootTest;
import org.springframework.test.context.junit4.SpringRunner;

import java.util.List;

@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testWrapper() {
        QueryWrapper<User> wrapper = new QueryWrapper<>();

        //SELECT id,user_name,password,name,age,email FROM tb_user WHERE name LIKE ?
        //Parameters: %曹%(String)
        wrapper.like("name", "曹");

        List<User> users = this.userMapper.selectList(wrapper);
        for (User user : users) {
            System.out.println(user);
        }

    }

}
```

## 5.4、排序

- orderBy
    - 排序：ORDER BY 字段, ...

  - 例: `orderBy(true, true, "id", "name")`--->`order by id ASC,name ASC`
- orderByAsc
  - 排序：ORDER BY 字段, ... ASC
  - 例: `orderByAsc("id", "name")`--->`order by id ASC,name ASC`
- orderByDesc
  - 排序：ORDER BY 字段, ... DESC
  - 例: `orderByDesc("id", "name")`--->`order by id DESC,name DESC`

测试用例：

```java
package cn.itcast.mp;

import cn.itcast.mp.mapper.UserMapper;
import cn.itcast.mp.pojo.User;
import com.baomidou.mybatisplus.core.conditions.query.QueryWrapper;
import org.junit.Test;
import org.junit.runner.RunWith;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.test.context.SpringBootTest;
import org.springframework.test.context.junit4.SpringRunner;

import java.util.List;

@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testWrapper() {
        QueryWrapper<User> wrapper = new QueryWrapper<>();

        //SELECT id,user_name,password,name,age,email FROM tb_user ORDER BY age DESC
        wrapper.orderByDesc("age");

        List<User> users = this.userMapper.selectList(wrapper);
        for (User user : users) {
            System.out.println(user);
        }

    }

}
```

## 5.5、逻辑查询

- or
  - 拼接 OR
  - 主动调用`or`表示紧接着下一个**方法**不是用`and`连接!(不调用`or`则默认为使用`and`连接)

- and
  - AND 嵌套
  - 例: `and(i -> i.eq("name", "李白").ne("status", "活着"))`--->`and (name = '李白' and status <> '活着')`

测试用例：

```java
package cn.itcast.mp;

import cn.itcast.mp.mapper.UserMapper;
import cn.itcast.mp.pojo.User;
import com.baomidou.mybatisplus.core.conditions.query.QueryWrapper;
import org.junit.Test;
import org.junit.runner.RunWith;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.test.context.SpringBootTest;
import org.springframework.test.context.junit4.SpringRunner;

import java.util.List;

@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testWrapper() {
        QueryWrapper<User> wrapper = new QueryWrapper<>();

        //SELECT id,user_name,password,name,age,email FROM tb_user WHERE name = ? OR age = ?
        wrapper.eq("name","李四").or().eq("age", 24);

        List<User> users = this.userMapper.selectList(wrapper);
        for (User user : users) {
            System.out.println(user);
        }

    }

}
```

## 5.6、select

在MP查询中，默认查询所有的字段，如果有需要也可以通过select方法进行指定字段。

```java
package cn.itcast.mp;

import cn.itcast.mp.mapper.UserMapper;
import cn.itcast.mp.pojo.User;
import com.baomidou.mybatisplus.core.conditions.query.QueryWrapper;
import org.junit.Test;
import org.junit.runner.RunWith;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.test.context.SpringBootTest;
import org.springframework.test.context.junit4.SpringRunner;

import java.util.List;

@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testWrapper() {
        QueryWrapper<User> wrapper = new QueryWrapper<>();

        //SELECT id,name,age FROM tb_user WHERE name = ? OR age = ?
        wrapper.eq("name", "李四")
                .or()
                .eq("age", 24)
                .select("id", "name", "age");

        List<User> users = this.userMapper.selectList(wrapper);
        for (User user : users) {
            System.out.println(user);
        }

    }

}
```

## 课程介绍

- ActiveRecord
- Oracle 主键Sequence
- Mybatis-Plus的插件
- Sql 注入器实现自定义全局操作
- 自动填充功能
- 逻辑删除
- 通用枚举
- 代码生成器
- MybatisX 快速开发插件

## 1、ActiveRecord

ActiveRecord（简称AR）一直广受动态语言（ PHP 、 Ruby 等）的喜爱，而 Java 作为准静态语言，对于 ActiveRecord 往往只能感叹其优雅，所以我们也在 AR 道路上进行了一定的探索，喜欢大家能够喜欢。

> **什么是ActiveRecord？**
>
> ActiveRecord也属于ORM（对象关系映射）层，由Rails最早提出，遵循标准的ORM模型：表映射到记录，记录映射到对象，字段映射到对象属性。配合遵循的命名和配置惯例，能够很大程度的快速实现模型的操作，而且简洁易懂。
>
> ActiveRecord的主要思想是：
>
> - 每一个数据库表对应创建一个类，类的每一个对象实例对应于数据库中表的一行记录；通常表的每个字段在类中都有相应的Field；
> - ActiveRecord同时负责把自己持久化，在ActiveRecord中封装了对数据库的访问，即CURD;；
> - ActiveRecord是一种领域模型(Domain Model)，封装了部分业务逻辑；

### 1.1、开启AR之旅

在MP中，开启AR非常简单，只需要将实体对象继承Model即可。

```java
package cn.itcast.mp.pojo;

import com.baomidou.mybatisplus.annotation.IdType;
import com.baomidou.mybatisplus.annotation.TableField;
import com.baomidou.mybatisplus.annotation.TableId;
import com.baomidou.mybatisplus.annotation.TableName;
import com.baomidou.mybatisplus.extension.activerecord.Model;
import lombok.AllArgsConstructor;
import lombok.Data;
import lombok.NoArgsConstructor;

@Data
@NoArgsConstructor
@AllArgsConstructor
public class User extends Model<User> {

    private Long id;
    private String userName;
    private String password;
    private String name;
    private Integer age;
    private String email;

}
```

## 1.2、根据主键查询

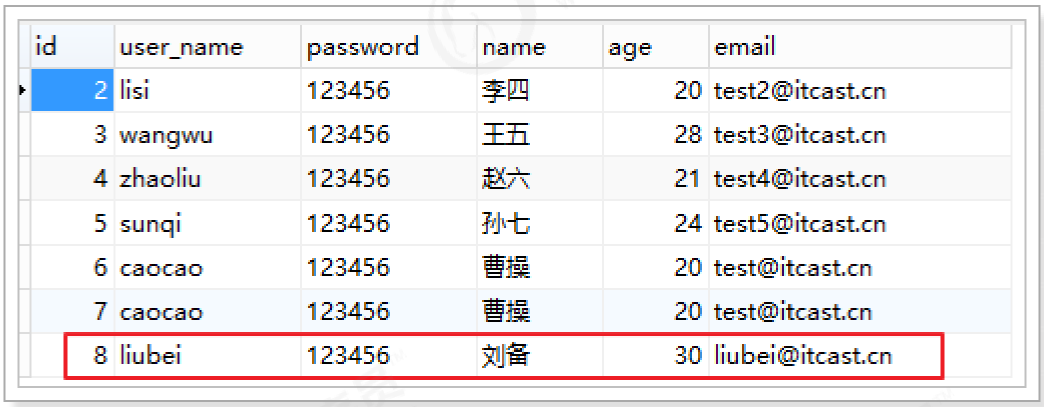
```java
@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testAR() {
        User user = new User();
        user.setId(2L);
        User user2 = user.selectById();

        System.out.println(user2);
    }

}
```

## 1.3、新增数据

```java
@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testAR() {
        User user = new User();
        user.setName("刘备");
        user.setAge(30);
        user.setPassword("123456");
        user.setUserName("liubei");
        user.setEmail("liubei@itcast.cn");

        boolean insert = user.insert();

        System.out.println(insert);
    }

}
```

结果：

```
[main] [cn.itcast.mp.mapper.UserMapper.insert]-[DEBUG] ==>  Preparing: INSERT INTO tb_user ( user_name, password, name, age, email ) VALUES ( ?, ?, ?, ?, ? )
[main] [cn.itcast.mp.mapper.UserMapper.insert]-[DEBUG] ==> Parameters: liubei(String), 123456(String), 刘备(String), 30(Integer), liubei@itcast.cn(String)
[main] [cn.itcast.mp.mapper.UserMapper.insert]-[DEBUG] <==    Updates: 1
```



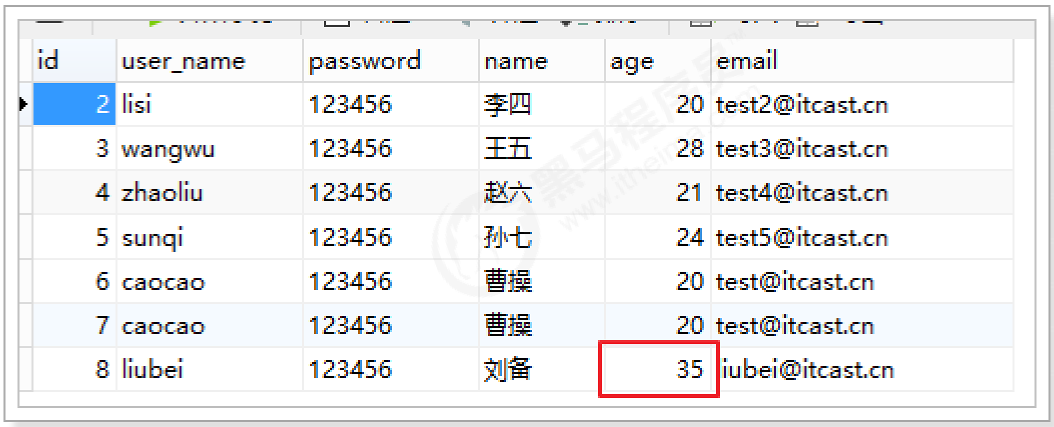
| id | user_name | password | name | age | email |
|---|---|---|---|---|---|
| 2 | lisi | 123456 | 李四 | 20 | test2@itcast.cn |
| 3 | wangwu | 123456 | 王五 | 28 | test3@itcast.cn |
| 4 | zhaoliu | 123456 | 赵六 | 21 | test4@itcast.cn |
| 5 | sunqi | 123456 | 孙七 | 24 | test5@itcast.cn |
| 6 | caocao | 123456 | 曹操 | 20 | test@itcast.cn |
| 7 | caocao | 123456 | 曹操 | 20 | test@itcast.cn |
| 8 | liubei | 123456 | 刘备 | 30 | liubei@itcast.cn |

## 1.5、更新操作

```java
@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testAR() {
        User user = new User();
        user.setId(8L);
        user.setAge(35);

        boolean update = user.updateById();
        System.out.println(update);
    }

}
```

结果：

```
[main] [cn.itcast.mp.mapper.UserMapper.updateById]-[DEBUG] ==>  Preparing: UPDATE tb_user SET age=? WHERE id=?
[main] [cn.itcast.mp.mapper.UserMapper.updateById]-[DEBUG] ==> Parameters: 35(Integer), 8(Long)
[main] [cn.itcast.mp.mapper.UserMapper.updateById]-[DEBUG] <==    Updates: 1
```



| id | user_name | password | name | age | email |
|---|---|---|---|---|---|
| 2 | lisi | 123456 | 李四 | 20 | test2@itcast.cn |
| 3 | wangwu | 123456 | 王五 | 28 | test3@itcast.cn |
| 4 | zhaoliu | 123456 | 赵六 | 21 | test4@itcast.cn |
| 5 | sunqi | 123456 | 孙七 | 24 | test5@itcast.cn |
| 6 | caocao | 123456 | 曹操 | 20 | test@itcast.cn |
| 7 | caocao | 123456 | 曹操 | 20 | test@itcast.cn |
| 8 | liubei | 123456 | 刘备 | 35 | liubei@itcast.cn |

## 1.6、删除操作

```java
@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testAR() {
        User user = new User();
        user.setId(7L);

        boolean delete = user.deleteById();
        System.out.println(delete);
    }

}
```

结果：

```
[main] [cn.itcast.mp.mapper.UserMapper.deleteById]-[DEBUG] ==>  Preparing: DELETE FROM tb_user WHERE id=?
[main] [cn.itcast.mp.mapper.UserMapper.deleteById]-[DEBUG] ==> Parameters: 7(Long)
[main] [cn.itcast.mp.mapper.UserMapper.deleteById]-[DEBUG] <==    Updates: 1
```

## 1.7、根据条件查询

```java
@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testAR() {
        User user = new User();
        QueryWrapper<User> userQueryWrapper = new QueryWrapper<>();
        userQueryWrapper.le("age","20");

        List<User> users = user.selectList(userQueryWrapper);
        for (User user1 : users) {
            System.out.println(user1);
        }
    }

}
```

结果：

```
[main] [cn.itcast.mp.mapper.UserMapper.selectList]-[DEBUG] ==>  Preparing: SELECT
id,user_name,password,name,age,email FROM tb_user WHERE age <= ?
[main] [cn.itcast.mp.mapper.UserMapper.selectList]-[DEBUG] ==> Parameters: 20(String)
[main] [cn.itcast.mp.mapper.UserMapper.selectList]-[DEBUG] <==      Total: 2

User(id=2, userName=lisi, password=123456, name=李四, age=20, email=test2@itcast.cn,
address=null)
User(id=6, userName=caocao, password=123456, name=曹操, age=20, email=test@itcast.cn,
address=null)
```

## 2、Oracle 主键Sequence

在mysql中，主键往往是自增长的，这样使用起来是比较方便的，如果使用的是Oracle数据库，那么就不能使用自增长了，就得使用Sequence 序列生成id值了。

### 2.1、部署Oracle环境

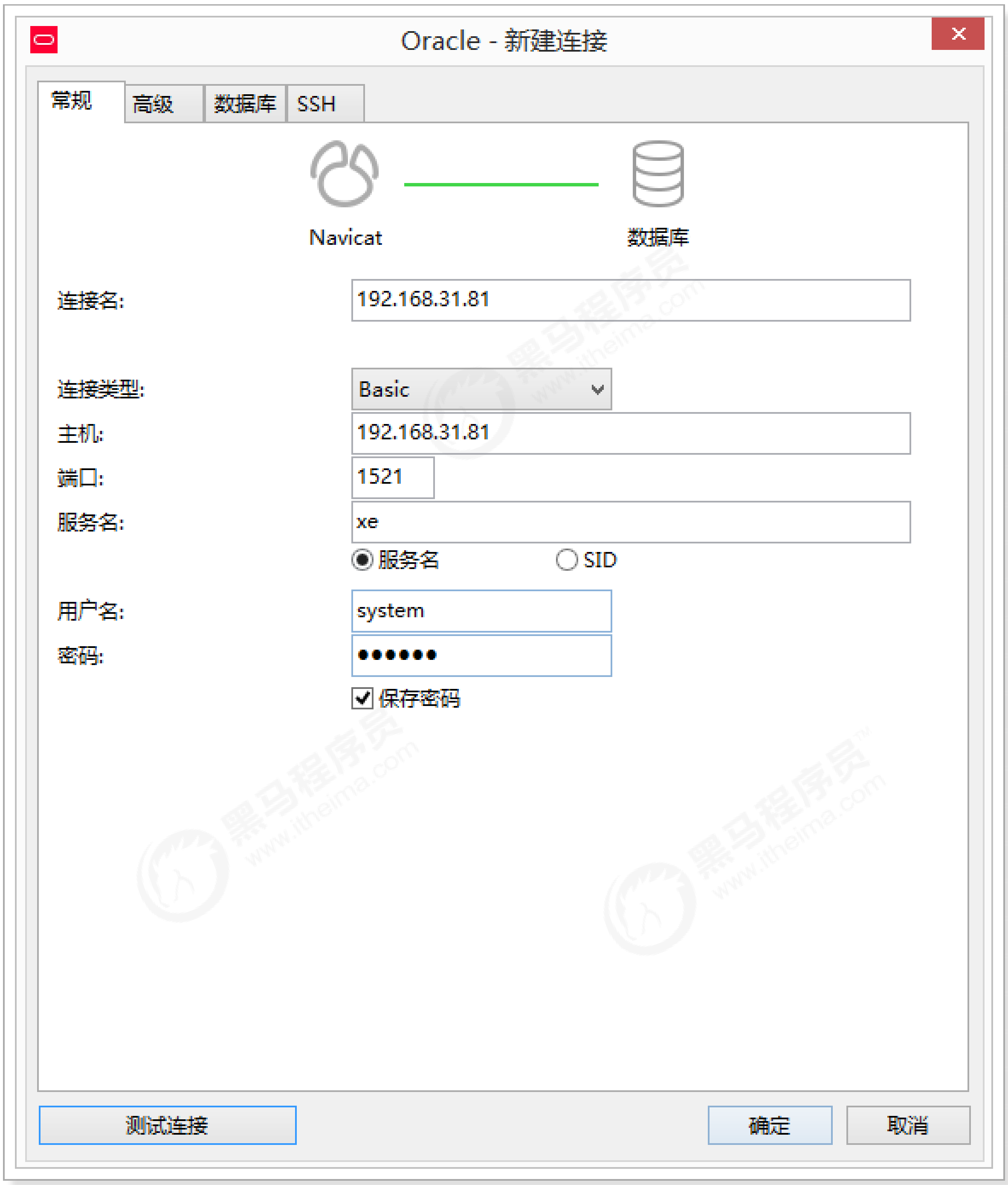
为了简化环境部署，这里使用Docker环境进行部署安装Oracle。

```
#拉取镜像
docker pull sath89/oracle-12c

#创建容器
docker create --name oracle -p 1521:1521 sath89/oracle-12c

#启动
docker start oracle && docker logs -f oracle

#下面是启动过程
Database not initialized. Initializing database.
Starting tnslsnr
```

```
Copying database files
1% complete
3% complete
11% complete
18% complete
26% complete
37% complete
Creating and starting Oracle instance
40% complete
45% complete
50% complete
55% complete
56% complete
60% complete
62% complete
Completing Database Creation
66% complete
70% complete
73% complete
85% complete
96% complete
100% complete
Look at the log file "/u01/app/oracle/cfgtoollogs/dbca/xe/xe.log" for further details.
Configuring Apex console
Database initialized. Please visit http://#containeer:8080/em
http://#containeer:8080/apex for extra configuration if needed
Starting web management console

PL/SQL procedure successfully completed.

Starting import from '/docker-entrypoint-initdb.d':
ls: cannot access /docker-entrypoint-initdb.d/*: No such file or directory
Import finished

Database ready to use. Enjoy! ;)

#通过用户名密码即可登录
用户名和密码为： system/oracle
```

下面使用navicat12进行连接并操作oracle，使用资料中提供的安装包，可以试用14天。

> 需要注意的是：由于安装的Oracle是64位版本，所以navicat也是需要使用64为版本，否则连接不成功。



连接名: 192.168.31.81

连接类型: Basic

主机: 192.168.31.81

端口: 1521

服务名: xe

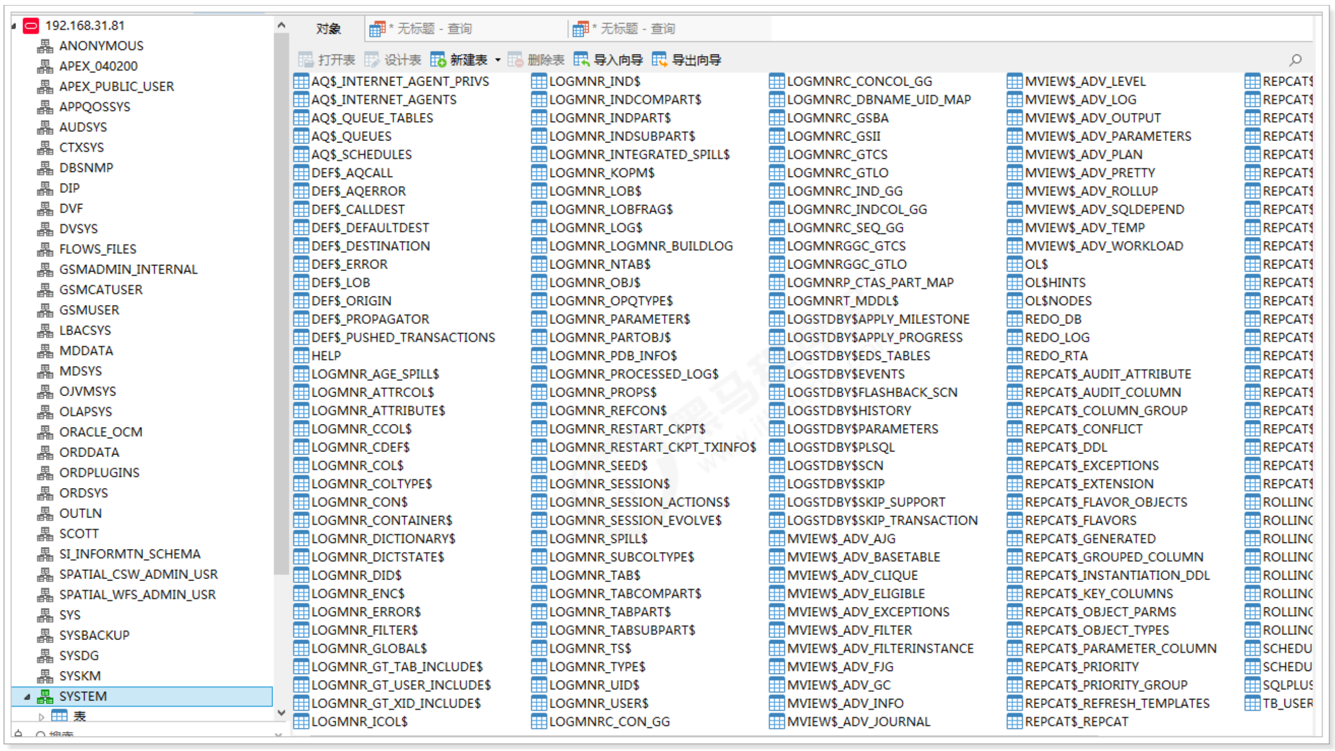
[✓ 服务名]　SID

用户名: system

密码: ••••••

[✓] 保存密码

连接成功：



192.168.31.81
ANONYMOUS
APEX_040200
APEX_PUBLIC_USER
APPQOSSYS
AUDSYS
CTXSYS
DBSNMP
DIP
DVF
DVSYS
FLOWS_FILES
GSMADMIN_INTERNAL
GSMCATUSER
GSMUSER
LBACSYS
MDDATA
MDSYS
OJVMSYS
OLAPSYS
ORACLE_OCM
ORDDATA
ORDPLUGINS
ORDSYS
OUTLN
SCOTT
SI_INFORMTN_SCHEMA
SPATIAL_CSW_ADMIN_USR
SPATIAL_WFS_ADMIN_USR
SYS
SYSBACKUP
SYSDG
SYSKM
SYSTEM

AQ$_INTERNET_AGENT_PRIVS
AQ$_INTERNET_AGENTS
AQ$_QUEUE_TABLES
AQ$_QUEUES
AQ$_SCHEDULES
DEF$_AQCALL
DEF$_AQERROR
DEF$_CALLDEST
DEF$_DEFAULTDEST
DEF$_DESTINATION
DEF$_ERROR
DEF$_LOB
DEF$_ORIGIN
DEF$_PROPAGATOR
DEF$_PUSHED_TRANSACTIONS
HELP
LOGMNR_AGE_SPILL$
LOGMNR_ATTRCOL$
LOGMNR_ATTRIBUTE$
LOGMNR_CCOL$
LOGMNR_CDEF$
LOGMNR_COL$
LOGMNR_COLTYPE$
LOGMNR_CON$
LOGMNR_CONTAINER$
LOGMNR_DICTIONARY$
LOGMNR_DICTSTATE$
LOGMNR_DID$
LOGMNR_ENC$
LOGMNR_ERROR$
LOGMNR_FILTER$
LOGMNR_GLOBAL$
LOGMNR_GT_TAB_INCLUDE$
LOGMNR_GT_USER_INCLUDE$
LOGMNR_GT_XID_INCLUDE$
LOGMNR_ICOL$
LOGMNR_IND$
LOGMNR_INDCOMPART$
LOGMNR_INDPART$
LOGMNR_INDSUBPART$
LOGMNR_INTEGRATED_SPILL$
LOGMNR_KOPM$
LOGMNR_LOB$
LOGMNR_LOBFRAG$
LOGMNR_LOG$
LOGMNR_LOGMNR_BUILDLOG
LOGMNR_NTAB$
LOGMNR_OBJ$
LOGMNR_OPQTYPE$
LOGMNR_PARAMETER$
LOGMNR_PARTOBJ$
LOGMNR_PDB_INFO$
LOGMNR_PROCESSED_LOG$
LOGMNR_PROPS$
LOGMNR_REFCON$
LOGMNR_RESTART_CKPT$
LOGMNR_RESTART_CKPT_TXINFO$
LOGMNR_SEED$
LOGMNR_SESSION$
LOGMNR_SESSION_ACTIONS$
LOGMNR_SESSION_EVOLVE$
LOGMNR_SPILL$
LOGMNR_SUBCOLTYPE$
LOGMNR_TAB$
LOGMNR_TABCOMPART$
LOGMNR_TABPART$
LOGMNR_TABSUBPART$
LOGMNR_TS$
LOGMNR_TYPE$
LOGMNR_UID$
LOGMNR_USER$
LOGMNRC_CON_GG
LOGMNRC_CONCOL_GG
LOGMNRC_DBNAME_UID_MAP
LOGMNRC_GSBA
LOGMNRC_GSII
LOGMNRC_GTCS
LOGMNRC_GTLO
LOGMNRC_IND_GG
LOGMNRC_INDCOL_GG
LOGMNRC_SEQ_GG
LOGMNRGGC_GTCS
LOGMNRGGC_GTLO
LOGMNRP_CTAS_PART_MAP
LOGMNRT_MDDL$
LOGSTDBY$APPLY_MILESTONE
LOGSTDBY$APPLY_PROGRESS
LOGSTDBY$EDS_TABLES
LOGSTDBY$EVENTS
LOGSTDBY$FLASHBACK_SCN
LOGSTDBY$HISTORY
LOGSTDBY$PARAMETERS
LOGSTDBY$PLSQL
LOGSTDBY$SCN
LOGSTDBY$SKIP
LOGSTDBY$SKIP_SUPPORT
LOGSTDBY$SKIP_TRANSACTION
MVIEW$_ADV_AJG
MVIEW$_ADV_BASETABLE
MVIEW$_ADV_CLIQUE
MVIEW$_ADV_ELIGIBLE
MVIEW$_ADV_EXCEPTIONS
MVIEW$_ADV_FILTER
MVIEW$_ADV_FILTERINSTANCE
MVIEW$_ADV_FJG
MVIEW$_ADV_GC
MVIEW$_ADV_INFO
MVIEW$_ADV_JOURNAL
MVIEW$_ADV_LEVEL
MVIEW$_ADV_LOG
MVIEW$_ADV_OUTPUT
MVIEW$_ADV_PARAMETERS
MVIEW$_ADV_PLAN
MVIEW$_ADV_PRETTY
MVIEW$_ADV_ROLLUP
MVIEW$_ADV_SQLDEPEND
MVIEW$_ADV_TEMP
MVIEW$_ADV_WORKLOAD
OL$
OL$HINTS
OL$NODES
REDO_DB
REDO_LOG
REDO_RTA
REPCAT$_AUDIT_ATTRIBUTE
REPCAT$_AUDIT_COLUMN
REPCAT$_COLUMN_GROUP
REPCAT$_CONFLICT
REPCAT$_DDL
REPCAT$_EXCEPTIONS
REPCAT$_EXTENSION
REPCAT$_FLAVOR_OBJECTS
REPCAT$_FLAVORS
REPCAT$_GENERATED
REPCAT$_GROUPED_COLUMN
REPCAT$_INSTANTIATION_DDL
REPCAT$_KEY_COLUMNS
REPCAT$_OBJECT_PARMS
REPCAT$_OBJECT_TYPES
REPCAT$_PARAMETER_COLUMN
REPCAT$_PRIORITY
REPCAT$_PRIORITY_GROUP
REPCAT$_REFRESH_TEMPLATES
REPCAT$_REPCAT
REPCAT$
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SCHEDU
SQLPLUS
TB_USER

## 2.2、创建表以及序列

```sql
--创建表，表名以及字段名都要大写
CREATE TABLE "TB_USER" (
  "ID" NUMBER(20) VISIBLE NOT NULL ,
  "USER_NAME" VARCHAR2(255 BYTE) VISIBLE ,
  "PASSWORD" VARCHAR2(255 BYTE) VISIBLE ,
  "NAME" VARCHAR2(255 BYTE) VISIBLE ,
  "AGE" NUMBER(10) VISIBLE ,
  "EMAIL" VARCHAR2(255 BYTE) VISIBLE
)

--创建序列
CREATE SEQUENCE SEQ_USER START WITH 1 INCREMENT BY 1
```

## 2.3、jdbc驱动包

由于版权原因，我们不能直接通过maven的中央仓库下载oracle数据库的jdbc驱动包，所以我们需要将驱动包安装到本地仓库。

```
#ojdbc8.jar文件在资料中可以找到

mvn install:install-file -DgroupId=com.oracle -DartifactId=ojdbc8 -Dversion=12.1.0.1 -Dpackaging=jar -Dfile=ojdbc8.jar
```

安装完成后的坐标：

```xml
<dependency>
    <groupId>com.oracle</groupId>
    <artifactId>ojdbc8</artifactId>
    <version>12.1.0.1</version>
</dependency>
```

## 2.4、修改application.properties

对于application.properties的修改，需要修改2个位置，分别是：

```properties
#数据库连接配置
spring.datasource.driver-class-name=oracle.jdbc.OracleDriver
spring.datasource.url=jdbc:oracle:thin:@192.168.31.81:1521:xe
spring.datasource.username=system
spring.datasource.password=oracle

#id生成策略
mybatis-plus.global-config.db-config.id-type=input
```

## 2.5、配置序列

使用Oracle的序列需要做2件事情：

> 第一，需要配置MP的序列生成器到Spring容器：

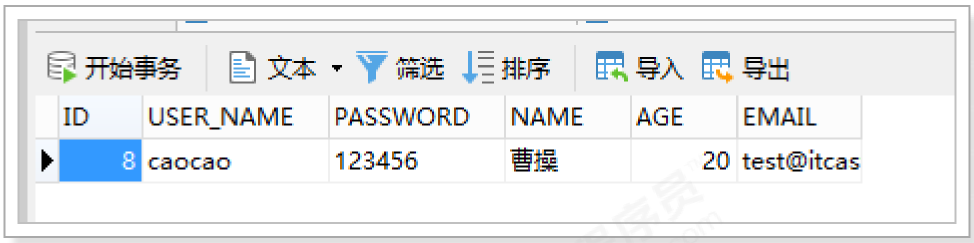
```java
package cn.itcast.mp;

import com.baomidou.mybatisplus.extension.incrementer.OracleKeyGenerator;
import com.baomidou.mybatisplus.extension.plugins.PaginationInterceptor;
import org.mybatis.spring.annotation.MapperScan;
import org.springframework.context.annotation.Bean;
import org.springframework.context.annotation.Configuration;

@Configuration
@MapperScan("cn.itcast.mp.mapper") //设置mapper接口的扫描包
public class MybatisPlusConfig {

    /**
     * 分页插件
     */
    @Bean
    public PaginationInterceptor paginationInterceptor() {
        return new PaginationInterceptor();
    }

    /**
     * 序列生成器
     */
    @Bean
    public OracleKeyGenerator oracleKeyGenerator(){
        return new OracleKeyGenerator();
    }
}
```

> 第二，在实体对象中指定序列的名称：

```java
@KeySequence(value = "SEQ_USER", clazz = Long.class)
public class User{
    ......
}
```

## 2.6、测试

```java
package cn.itcast.mp;

import cn.itcast.mp.mapper.UserMapper;
import cn.itcast.mp.pojo.User;
import org.junit.Test;
import org.junit.runner.RunWith;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.test.context.SpringBootTest;
import org.springframework.test.context.junit4.SpringRunner;

import java.util.List;

@RunWith(SpringRunner.class)
@SpringBootTest
public class UserMapperTest {

    @Autowired
    private UserMapper userMapper;

    @Test
    public void testInsert(){
        User user = new User();
        user.setAge(20);
        user.setEmail("test@itcast.cn");
        user.setName("曹操");
        user.setUserName("caocao");
        user.setPassword("123456");

        int result = this.userMapper.insert(user); //返回的result是受影响的行数，并不是自增后的id
        System.out.println("result = " + result);

        System.out.println(user.getId()); //自增后的id会回填到对象中
    }

    @Test
    public void testSelectById(){
        User user = this.userMapper.selectById(8L);
        System.out.println(user);
    }
}
```



| ID | USER_NAME | PASSWORD | NAME | AGE | EMAIL |
|---|---|---|---|---|---|
| 8 | caocao | 123456 | 曹操 | 20 | test@itcas |

## 3、插件

### 3.1、mybatis的插件机制

MyBatis 允许你在已映射语句执行过程中的某一点进行拦截调用。默认情况下，MyBatis 允许使用插件来拦截的方法调用包括：

1. Executor (update, query, flushStatements, commit, rollback, getTransaction, close, isClosed)
2. ParameterHandler (getParameterObject, setParameters)
3. ResultSetHandler (handleResultSets, handleOutputParameters)
4. StatementHandler (prepare, parameterize, batch, update, query)

我们看到了可以拦截Executor接口的部分方法，比如update，query，commit，rollback等方法，还有其他接口的一些方法等。

总体概括为：

1. 拦截执行器的方法
2. 拦截参数的处理
3. 拦截结果集的处理
4. 拦截Sql语法构建的处理

拦截器示例：

```java
package cn.itcast.mp.plugins;

import org.apache.ibatis.executor.Executor;
import org.apache.ibatis.mapping.MappedStatement;
import org.apache.ibatis.plugin.*;

import java.util.Properties;

@Intercepts({@Signature(
        type= Executor.class,
        method = "update",
        args = {MappedStatement.class,Object.class})})
public class MyInterceptor implements Interceptor {

    @Override
    public Object intercept(Invocation invocation) throws Throwable {
        //拦截方法，具体业务逻辑编写的位置
        return invocation.proceed();
    }

    @Override
    public Object plugin(Object target) {
        //创建target对象的代理对象,目的是将当前拦截器加入到该对象中
        return Plugin.wrap(target, this);
    }

    @Override
    public void setProperties(Properties properties) {
        //属性设置
    }
}
```

注入到Spring容器：

```java
    /**
     * 自定义拦截器
     */
    @Bean
    public MyInterceptor myInterceptor(){
        return new MyInterceptor();
    }
```

或者通过xml配置，mybatis-config.xml：

```xml
<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE configuration
        PUBLIC "-//mybatis.org//DTD Config 3.0//EN"
        "http://mybatis.org/dtd/mybatis-3-config.dtd">
<configuration>
    <plugins>
        <plugin interceptor="cn.itcast.mp.plugins.MyInterceptor"></plugin>
    </plugins>
</configuration>
```

## 3.2、执行分析插件

在MP中提供了对SQL执行的分析的插件，可用作阻断全表更新、删除的操作，注意：该插件仅适用于开发环境，不适用于生产环境。

SpringBoot配置：

```java
@Bean
public SqlExplainInterceptor sqlExplainInterceptor(){
    SqlExplainInterceptor sqlExplainInterceptor = new SqlExplainInterceptor();

    List<ISqlParser> sqlParserList = new ArrayList<>();
    // 攻击 SQL 阻断解析器、加入解析链
    sqlParserList.add(new BlockAttackSqlParser());
    sqlExplainInterceptor.setSqlParserList(sqlParserList);

    return sqlExplainInterceptor;
}
```

测试：

```java
@Test
public void testUpdate(){
    User user = new User();
    user.setAge(20);

    int result = this.userMapper.update(user, null);
    System.out.println("result = " + result);
}
```

结果：

```
Caused by: com.baomidou.mybatisplus.core.exceptions.MybatisPlusException: Prohibition of table update operation
    at com.baomidou.mybatisplus.core.toolkit.ExceptionUtils.mpe(ExceptionUtils.java:49)
    at com.baomidou.mybatisplus.core.toolkit.Assert.isTrue(Assert.java:38)
    at com.baomidou.mybatisplus.core.toolkit.Assert.notNull(Assert.java:72)
    at com.baomidou.mybatisplus.extension.parsers.BlockAttackSqlParser.processUpdate(BlockAttackSqlParser.java:45)
    at com.baomidou.mybatisplus.core.parser.AbstractJsqlParser.processParser(AbstractJsqlParser.java:92)
    at com.baomidou.mybatisplus.core.parser.AbstractJsqlParser.parser(AbstractJsqlParser.java:67)
    at com.baomidou.mybatisplus.extension.handlers.AbstractSqlParserHandler.sqlParser(AbstractSqlParserHandler.java:76)
    at com.baomidou.mybatisplus.extension.plugins.SqlExplainInterceptor.intercept(SqlExplainInterceptor.java:63)
    at org.apache.ibatis.plugin.Plugin.invoke(Plugin.java:61)
    at com.sun.proxy.$Proxy70.update(Unknown Source)
    at org.apache.ibatis.session.defaults.DefaultSqlSession.update(DefaultSqlSession.java:197)
    ... 41 more
```

可以看到，当执行全表更新时，会抛出异常，这样有效防止了一些误操作。

## 3.3、性能分析插件

性能分析拦截器，用于输出每条 SQL 语句及其执行时间，可以设置最大执行时间，超过时间会抛出异常。

> **该插件只用于开发环境，不建议生产环境使用。**

配置：

```xml
<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE configuration
        PUBLIC "-//mybatis.org//DTD Config 3.0//EN"
        "http://mybatis.org/dtd/mybatis-3-config.dtd">
<configuration>
    <plugins>
        <!-- SQL 执行性能分析，开发环境使用，线上不推荐。 maxTime 指的是 sql 最大执行时长 -->
        <plugin interceptor="com.baomidou.mybatisplus.extension.plugins.PerformanceInterceptor">
            <property name="maxTime" value="100" />
            <!--SQL是否格式化 默认false-->
            <property name="format" value="true" />
        </plugin>
    </plugins>
</configuration>
```

执行结果：

```
Time：11 ms - ID：cn.itcast.mp.mapper.UserMapper.selectById
Execute SQL：
    SELECT
        id,
        user_name,
        password,
        name,
        age,
        email
    FROM
        tb_user
    WHERE
        id=7
```

可以看到，执行时间为11ms。如果将maxTime设置为1，那么，该操作会抛出异常。

```
Caused by: com.baomidou.mybatisplus.core.exceptions.MybatisPlusException:  The SQL
execution time is too large, please optimize !
    at com.baomidou.mybatisplus.core.toolkit.ExceptionUtils.mpe(ExceptionUtils.java:49)
    at com.baomidou.mybatisplus.core.toolkit.Assert.isTrue(Assert.java:38)
    ................
```

## 3.4、乐观锁插件

### 3.4.1、主要适用场景

意图：

当要更新一条记录的时候，希望这条记录没有被别人更新

乐观锁实现方式：

- 取出记录时，获取当前version
- 更新时，带上这个version
- 执行更新时， set version = newVersion where version = oldVersion
- 如果version不对，就更新失败

### 3.4.2、插件配置

spring xml:

```
<bean class="com.baomidou.mybatisplus.extension.plugins.OptimisticLockerInterceptor"/>
```

spring boot:

```
@Bean
public OptimisticLockerInterceptor optimisticLockerInterceptor() {
    return new OptimisticLockerInterceptor();
}
```

### 3.4.3、注解实体字段

需要为实体字段添加@Version注解。

> 第一步，为表添加version字段，并且设置初始值为1：

```
ALTER TABLE `tb_user`
ADD COLUMN `version`  int(10) NULL AFTER `email`;

UPDATE `tb_user` SET `version`='1';
```

第二步，为User实体对象添加version字段，并且添加@Version注解：

```
@Version
private Integer version;
```

### 3.4.4、测试

测试用例：

```
@Test
public void testUpdate(){
    User user = new User();
    user.setAge(30);
    user.setId(2L);
    user.setVersion(1); //获取到version为1

    int result = this.userMapper.updateById(user);
    System.out.println("result = " + result);
}
```

执行日志：

```
main] [com.baomidou.mybatisplus.extension.parsers.BlockAttackSqlParser]-[DEBUG] Original SQL: UPDATE tb_user  SET age=?,

version=?  WHERE id=?   AND version=?
[main] [com.baomidou.mybatisplus.extension.parsers.BlockAttackSqlParser]-[DEBUG] parser sql: UPDATE tb_user SET age = ?, version = ? WHERE id = ? AND version = ?
[main] [org.springframework.jdbc.datasource.DataSourceUtils]-[DEBUG] Fetching JDBC Connection from DataSource
[main] [org.mybatis.spring.transaction.SpringManagedTransaction]-[DEBUG] JDBC Connection [HikariProxyConnection@540206885 wrapping com.mysql.jdbc.JDBC4Connection@27e0f2f5] will not be managed by Spring
[main] [cn.itcast.mp.mapper.UserMapper.updateById]-[DEBUG] ==>  Preparing: UPDATE tb_user SET age=?, version=? WHERE id=? AND version=?
[main] [cn.itcast.mp.mapper.UserMapper.updateById]-[DEBUG] ==> Parameters: 30(Integer), 2(Integer), 2(Long), 1(Integer)
[main] [cn.itcast.mp.mapper.UserMapper.updateById]-[DEBUG] <==    Updates: 1
[main] [org.mybatis.spring.SqlSessionUtils]-[DEBUG] Closing non transactional SqlSession [org.apache.ibatis.session.defaults.DefaultSqlSession@30135202]
result = 1
```

可以看到，更新的条件中有version条件，并且更新的version为2。

如果再次执行，更新则不成功。这样就避免了多人同时更新时导致数据的不一致。

### 3.4.5、特别说明

- **支持的数据类型只有:int,Integer,long,Long,Date,Timestamp,LocalDateTime**
- 整数类型下 `newVersion = oldVersion + 1`
- `newVersion` 会回写到 `entity` 中
- 仅支持 `updateById(id)` 与 `update(entity, wrapper)` 方法
- **在 update(entity, wrapper) 方法下, wrapper 不能复用!!!**

# 4、Sql 注入器

我们已经知道，在MP中，通过AbstractSqlInjector将BaseMapper中的方法注入到了Mybatis容器，这样这些方法才可以正常执行。

那么，如果我们需要扩充BaseMapper中的方法，又该如何实现呢？

下面我们以扩展findAll方法为例进行学习。

## 4.1、编写MyBaseMapper

```java
package cn.itcast.mp.mapper;

import com.baomidou.mybatisplus.core.mapper.BaseMapper;

import java.util.List;

public interface MyBaseMapper<T> extends BaseMapper<T> {

    List<T>  findAll();

}
```

其他的Mapper都可以继承该Mapper，这样实现了统一的扩展。

如：

```java
package cn.itcast.mp.mapper;

import cn.itcast.mp.pojo.User;

public interface UserMapper extends MyBaseMapper<User> {

    User findById(Long id);
}
```

## 4.2、编写MySqlInjector

如果直接继承AbstractSqlInjector的话，原有的BaseMapper中的方法将失效，所以我们选择继承DefaultSqlInjector进行扩展。

```java
package cn.itcast.mp.sqlInjector;

import com.baomidou.mybatisplus.core.injector.AbstractMethod;
import com.baomidou.mybatisplus.core.injector.DefaultSqlInjector;

import java.util.List;

public class MySqlInjector extends DefaultSqlInjector {

    @Override
    public List<AbstractMethod> getMethodList() {
        List<AbstractMethod> methodList = super.getMethodList();

        methodList.add(new FindAll());

        // 再扩充自定义的方法
        list.add(new FindAll());

        return methodList;
    }
}
```

### 4.3、编写FindAll

```java
package cn.itcast.mp.sqlInjector;

import com.baomidou.mybatisplus.core.enums.SqlMethod;
import com.baomidou.mybatisplus.core.injector.AbstractMethod;
import com.baomidou.mybatisplus.core.metadata.TableInfo;
import org.apache.ibatis.mapping.MappedStatement;
import org.apache.ibatis.mapping.SqlSource;

public class FindAll extends AbstractMethod {

    @Override
    public MappedStatement injectMappedStatement(Class<?> mapperClass, Class<?> modelClass, TableInfo tableInfo) {
        String sqlMethod = "findAll";
        String sql = "select * from " + tableInfo.getTableName();
        SqlSource sqlSource = languageDriver.createSqlSource(configuration, sql, modelClass);
        return this.addSelectMappedStatement(mapperClass, sqlMethod, sqlSource, modelClass, tableInfo);
    }

}
```

### 4.4、注册到Spring容器

```java
/**
 * 自定义SQL注入器
 */
@Bean
public MySqlInjector mySqlInjector(){
    return new MySqlInjector();
}
```

### 4.5、测试

```java
@Test
public void testFindAll(){
    List<User> users = this.userMapper.findAll();
    for (User user : users) {
        System.out.println(user);
    }
}
```

输出的SQL：

```
[main] [cn.itcast.mp.mapper.UserMapper.findAll]-[DEBUG] ==>  Preparing: select * from
tb_user
[main] [cn.itcast.mp.mapper.UserMapper.findAll]-[DEBUG] ==> Parameters:
[main] [cn.itcast.mp.mapper.UserMapper.findAll]-[DEBUG] <==      Total: 10
```

至此，我们实现了全局扩展SQL注入器。

## 5、自动填充功能

有些时候我们可能会有这样的需求，插入或者更新数据时，希望有些字段可以自动填充数据，比如密码、version等。在MP中提供了这样的功能，可以实现自动填充。

### 5.1、添加@TableField注解

```
@TableField(fill = FieldFill.INSERT) //插入数据时进行填充
private String password;
```

为password添加自动填充功能，在新增数据时有效。

FieldFill提供了多种模式选择：

```
public enum FieldFill {
    /**
     * 默认不处理
     */
    DEFAULT,
    /**
     * 插入时填充字段
     */
    INSERT,
    /**
     * 更新时填充字段
     */
    UPDATE,
    /**
     * 插入和更新时填充字段
     */
    INSERT_UPDATE
}
```

### 5.2、编写MyMetaObjectHandler

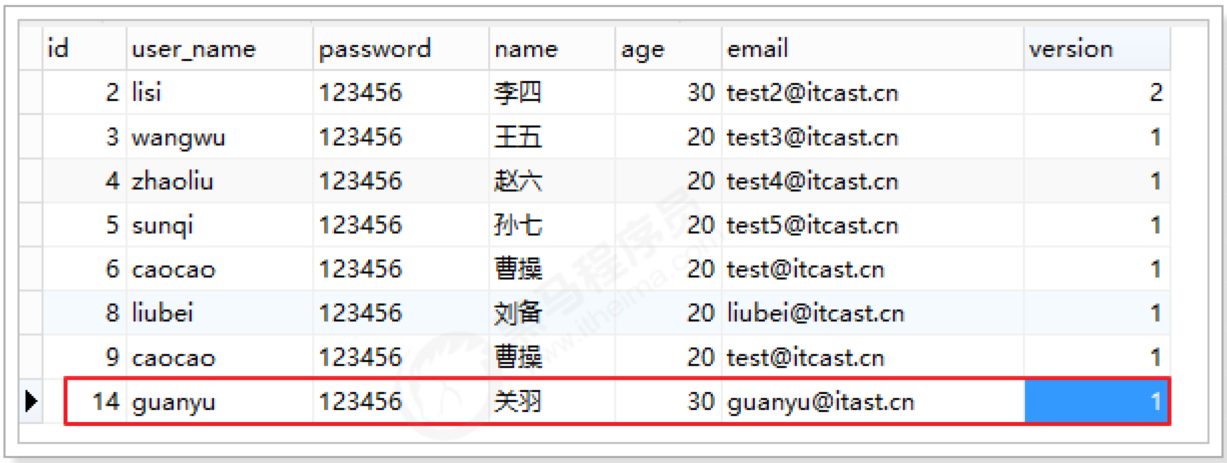
```
package cn.itcast.mp.handler;

import com.baomidou.mybatisplus.core.handlers.MetaObjectHandler;
import org.apache.ibatis.reflection.MetaObject;
import org.springframework.stereotype.Component;

@Component
public class MyMetaObjectHandler implements MetaObjectHandler {
```

```java

    @Override
    public void insertFill(MetaObject metaObject) {
        Object password = getFieldValByName("password", metaObject);
        if(null == password){
            //字段为空，可以进行填充
            setFieldValByName("password", "123456", metaObject);
        }
    }

    @Override
    public void updateFill(MetaObject metaObject) {

    }
}
```

### 5.3、测试

```java
@Test
public void testInsert(){
    User user = new User();
    user.setName("关羽");
    user.setUserName("guanyu");
    user.setAge(30);
    user.setEmail("guanyu@itast.cn");
    user.setVersion(1);

    int result = this.userMapper.insert(user);
    System.out.println("result = " + result);
}
```

结果：



| id | user_name | password | name | age | email | version |
|---|---|---|---|---|---|---|
| 2 | lisi | 123456 | 李四 | 30 | test2@itcast.cn | 2 |
| 3 | wangwu | 123456 | 王五 | 20 | test3@itcast.cn | 1 |
| 4 | zhaoliu | 123456 | 赵六 | 20 | test4@itcast.cn | 1 |
| 5 | sunqi | 123456 | 孙七 | 20 | test5@itcast.cn | 1 |
| 6 | caocao | 123456 | 曹操 | 20 | test@itcast.cn | 1 |
| 8 | liubei | 123456 | 刘备 | 20 | liubei@itcast.cn | 1 |
| 9 | caocao | 123456 | 曹操 | 20 | test@itcast.cn | 1 |
| 14 | guanyu | 123456 | 关羽 | 30 | guanyu@itast.cn | 1 |

## 6、 逻辑删除

开发系统时，有时候在实现功能时，删除操作需要实现逻辑删除，所谓逻辑删除就是将数据标记为删除，而并非真正的物理删除（非DELETE操作），查询时需要携带状态条件，确保被标记的数据不被查询到。这样做的目的就是避免数据被真正的删除。

MP就提供了这样的功能，方便我们使用，接下来我们一起学习下。

## 6.1、修改表结构

为tb_user表增加deleted字段，用于表示数据是否被删除，1代表删除，0代表未删除。

```sql
ALTER TABLE `tb_user`
ADD COLUMN `deleted`  int(1) NULL DEFAULT 0 COMMENT '1代表删除，0代表未删除' AFTER
`version`;
```

同时，也修改User实体，增加deleted属性并且添加@TableLogic注解：

```java
@TableLogic
private Integer deleted;
```

## 6.2、配置

application.properties：

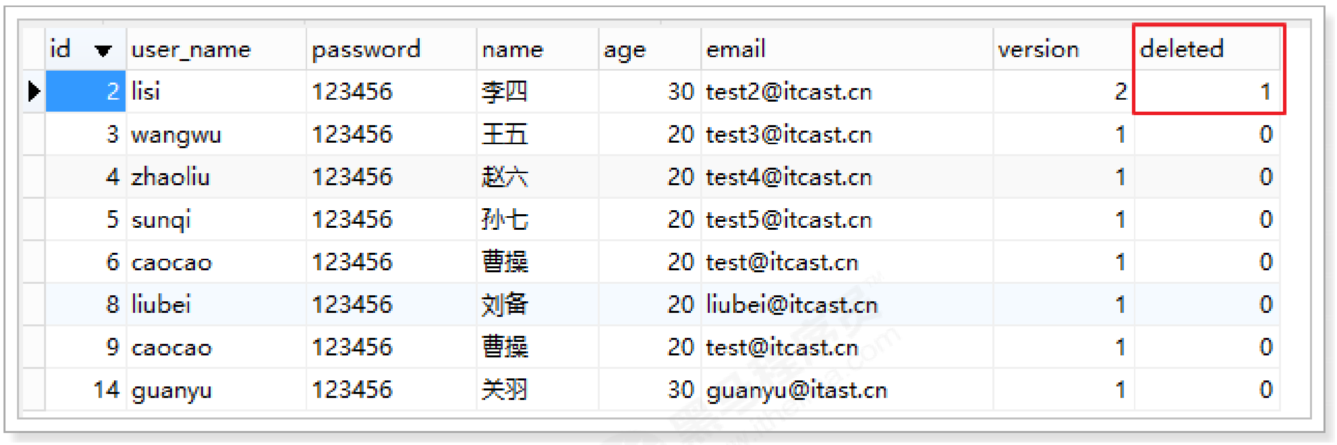
```properties
# 逻辑已删除值(默认为 1)
mybatis-plus.global-config.db-config.logic-delete-value=1
# 逻辑未删除值(默认为 0)
mybatis-plus.global-config.db-config.logic-not-delete-value=0
```

## 6.3、测试

```java
@Test
public void testDeleteById(){
    this.userMapper.deleteById(2L);
}
```

执行的SQL：

```
[main] [cn.itcast.mp.mapper.UserMapper.deleteById]-[DEBUG] ==>  Preparing: UPDATE
tb_user SET deleted=1 WHERE id=? AND deleted=0
[main] [cn.itcast.mp.mapper.UserMapper.deleteById]-[DEBUG] ==> Parameters: 2(Long)
[main] [cn.itcast.mp.mapper.UserMapper.deleteById]-[DEBUG] <==    Updates: 1
```



| id | user_name | password | name | age | email | version | deleted |
|---|---|---|---|---|---|---|---|
| 2 | lisi | 123456 | 李四 | 30 | test2@itcast.cn | 2 | 1 |
| 3 | wangwu | 123456 | 王五 | 20 | test3@itcast.cn | 1 | 0 |
| 4 | zhaoliu | 123456 | 赵六 | 20 | test4@itcast.cn | 1 | 0 |
| 5 | sunqi | 123456 | 孙七 | 20 | test5@itcast.cn | 1 | 0 |
| 6 | caocao | 123456 | 曹操 | 20 | test@itcast.cn | 1 | 0 |
| 8 | liubei | 123456 | 刘备 | 20 | liubei@itcast.cn | 1 | 0 |
| 9 | caocao | 123456 | 曹操 | 20 | test@itcast.cn | 1 | 0 |
| 14 | guanyu | 123456 | 关羽 | 30 | guanyu@itast.cn | 1 | 0 |

测试查询：

```
@Test
public void testSelectById(){
    User user = this.userMapper.selectById(2L);
    System.out.println(user);
}
```

执行的SQL：

```
[main] [cn.itcast.mp.mapper.UserMapper.selectById]-[DEBUG] ==>  Preparing: SELECT id,user_name,password,name,age,email,version,deleted FROM tb_user WHERE id=? AND deleted=0
[main] [cn.itcast.mp.mapper.UserMapper.selectById]-[DEBUG] ==> Parameters: 2(Long)
[main] [cn.itcast.mp.mapper.UserMapper.selectById]-[DEBUG] <==      Total: 0
```

可见，已经实现了逻辑删除。

## 7、 通用枚举

解决了繁琐的配置，让 mybatis 优雅的使用枚举属性！

### 7.1、修改表结构

```
ALTER TABLE `tb_user`
ADD COLUMN `sex`  int(1) NULL DEFAULT 1 COMMENT '1-男，2-女' AFTER `deleted`;
```

### 7.2、定义枚举

```
package cn.itcast.mp.enums;

import com.baomidou.mybatisplus.core.enums.IEnum;
import com.fasterxml.jackson.annotation.JsonValue;

public enum SexEnum implements IEnum<Integer> {

    MAN(1,"男"),
```

```java
    WOMAN(2,"女");

    private int value;
    private String desc;

    SexEnum(int value, String desc) {
        this.value = value;
        this.desc = desc;
    }

    @Override
    public Integer getValue() {
        return this.value;
    }

    @Override
    public String toString() {
        return this.desc;
    }
}
```

## 7.3、配置

```
# 枚举包扫描
mybatis-plus.type-enums-package=cn.itcast.mp.enums
```

## 7.4、修改实体

```java
private SexEnum sex;
```

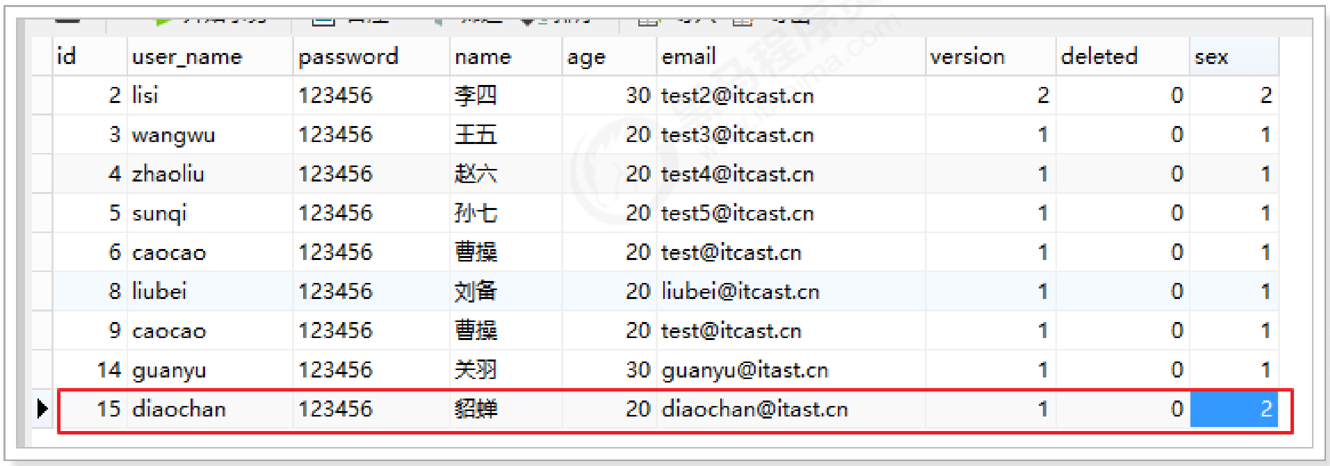
## 7.5、测试

测试插入数据：

```java
@Test
public void testInsert(){
    User user = new User();
    user.setName("貂蝉");
    user.setUserName("diaochan");
    user.setAge(20);
    user.setEmail("diaochan@itast.cn");
    user.setVersion(1);
    user.setSex(SexEnum.WOMAN);

    int result = this.userMapper.insert(user);
    System.out.println("result = " + result);
}
```

SQL：

```
[main] [cn.itcast.mp.mapper.UserMapper.insert]-[DEBUG] ==>  Preparing: INSERT INTO
tb_user ( user_name, password, name, age, email, version, sex ) VALUES ( ?, ?, ?, ?, ?,
?, ? )
[main] [cn.itcast.mp.mapper.UserMapper.insert]-[DEBUG] ==> Parameters:
diaochan(String), 123456(String), 貂蝉(String), 20(Integer), diaochan@itast.cn(String),
1(Integer), 2(Integer)
[main] [cn.itcast.mp.mapper.UserMapper.insert]-[DEBUG] <==    Updates: 1
```



| id | user_name | password | name | age | email | version | deleted | sex |
|---|---|---|---|---|---|---|---|---|
| 2 | lisi | 123456 | 李四 | 30 | test2@itcast.cn | 2 | 0 | 2 |
| 3 | wangwu | 123456 | 王五 | 20 | test3@itcast.cn | 1 | 0 | 1 |
| 4 | zhaoliu | 123456 | 赵六 | 20 | test4@itcast.cn | 1 | 0 | 1 |
| 5 | sunqi | 123456 | 孙七 | 20 | test5@itcast.cn | 1 | 0 | 1 |
| 6 | caocao | 123456 | 曹操 | 20 | test@itcast.cn | 1 | 0 | 1 |
| 8 | liubei | 123456 | 刘备 | 20 | liubei@itcast.cn | 1 | 0 | 1 |
| 9 | caocao | 123456 | 曹操 | 20 | test@itcast.cn | 1 | 0 | 1 |
| 14 | guanyu | 123456 | 关羽 | 30 | guanyu@itast.cn | 1 | 0 | 1 |
| 15 | diaochan | 123456 | 貂蝉 | 20 | diaochan@itast.cn | 1 | 0 | 2 |

查询：

```
    @Test
    public void testSelectById(){
        User user = this.userMapper.selectById(2L);
        System.out.println(user);
    }
```

结果：

```
[main] [cn.itcast.mp.mapper.UserMapper.selectById]-[DEBUG] ==>  Preparing: SELECT
id,user_name,password,name,age,email,version,deleted,sex FROM tb_user WHERE id=? AND
deleted=0
[main] [cn.itcast.mp.mapper.UserMapper.selectById]-[DEBUG] ==> Parameters: 2(Long)
[main] [cn.itcast.mp.mapper.UserMapper.selectById]-[DEBUG] <==      Total: 1

User(id=2, userName=lisi, password=123456, name=李四, age=30, email=test2@itcast.cn,
address=null, version=2, deleted=0, sex=女)
```

从测试可以看出，可以很方便的使用枚举了。

查询条件时也是有效的：

```java
    @Test
    public void testSelectBySex() {
        QueryWrapper<User> wrapper = new QueryWrapper<>();
        wrapper.eq("sex", SexEnum.WOMAN);
        List<User> users = this.userMapper.selectList(wrapper);
        for (User user : users) {
            System.out.println(user);
        }
    }
```

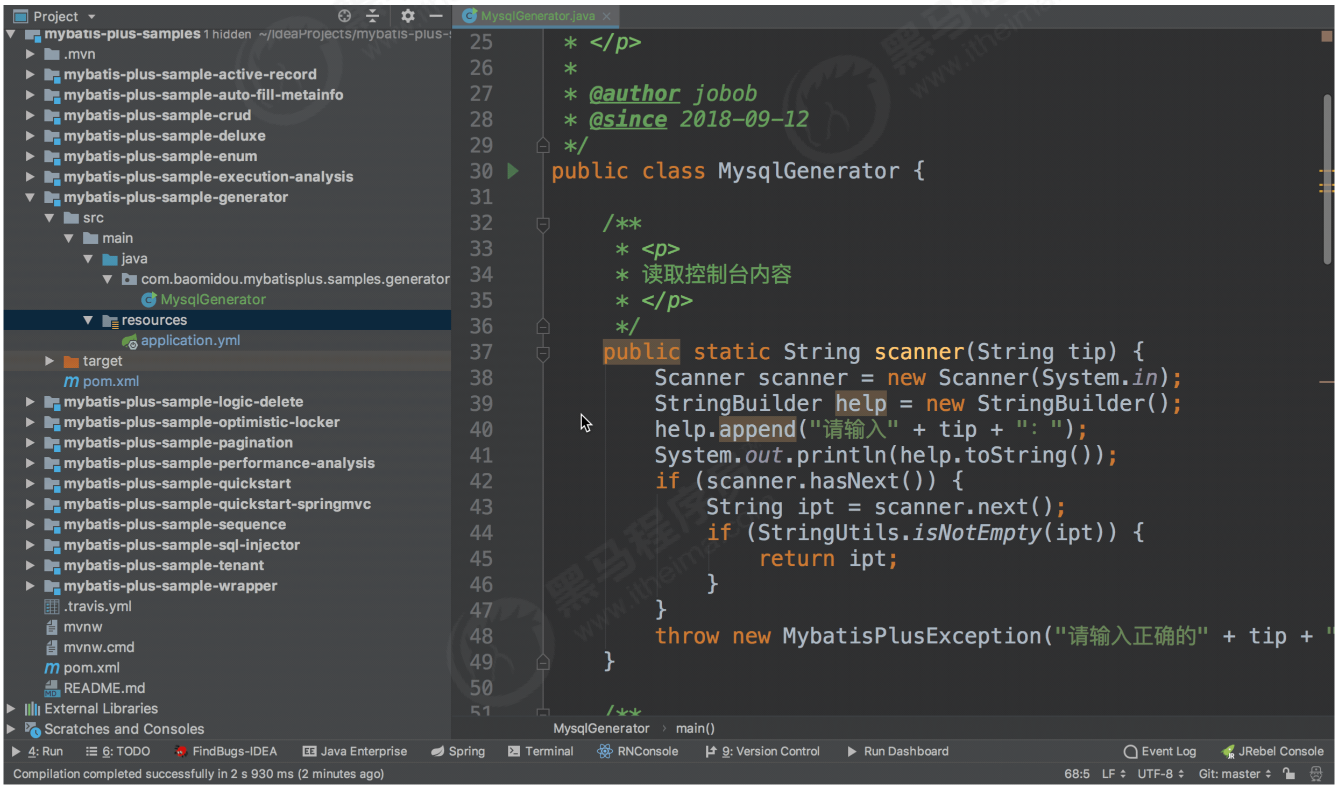
SQL：

```
[main] [cn.itcast.mp.mapper.UserMapper.selectList]-[DEBUG] ==>  Preparing: SELECT id,user_name,password,name,age,email,version,deleted,sex FROM tb_user WHERE deleted=0 AND sex = ?
[main] [cn.itcast.mp.mapper.UserMapper.selectList]-[DEBUG] ==> Parameters: 2(Integer)
[main] [cn.itcast.mp.mapper.UserMapper.selectList]-[DEBUG] <==      Total: 3
```

## 8、代码生成器

AutoGenerator 是 MyBatis-Plus 的代码生成器，通过 AutoGenerator 可以快速生成 Entity、Mapper、Mapper XML、Service、Controller 等各个模块的代码，极大的提升了开发效率。

效果：



```
Project
▼ mybatis-plus-samples 1 hidden ~/IdeaProjects/mybatis-plus-
  ▶ .mvn
  ▶ mybatis-plus-sample-active-record
  ▶ mybatis-plus-sample-auto-fill-metainfo
  ▶ mybatis-plus-sample-crud
  ▶ mybatis-plus-sample-deluxe
  ▶ mybatis-plus-sample-enum
  ▶ mybatis-plus-sample-execution-analysis
  ▼ mybatis-plus-sample-generator
    ▼ src
      ▼ main
        ▼ java
          ▼ com.baomidou.mybatisplus.samples.generator
              MysqlGenerator
        ▼ resources
            application.yml
    ▶ target
      pom.xml
  ▶ mybatis-plus-sample-logic-delete
  ▶ mybatis-plus-sample-optimistic-locker
  ▶ mybatis-plus-sample-pagination
  ▶ mybatis-plus-sample-performance-analysis
  ▶ mybatis-plus-sample-quickstart
  ▶ mybatis-plus-sample-quickstart-springmvc
  ▶ mybatis-plus-sample-sequence
  ▶ mybatis-plus-sample-sql-injector
  ▶ mybatis-plus-sample-tenant
  ▶ mybatis-plus-sample-wrapper
    .travis.yml
    mvnw
    mvnw.cmd
    pom.xml
    README.md
▶ External Libraries
▶ Scratches and Consoles
```

MysqlGenerator.java

```java
 * </p>
 *
 * @author jobob
 * @since 2018-09-12
 */
public class MysqlGenerator {

    /**
     * <p>
     * 读取控制台内容
     * </p>
     */
    public static String scanner(String tip) {
        Scanner scanner = new Scanner(System.in);
        StringBuilder help = new StringBuilder();
        help.append("请输入" + tip + ": ");
        System.out.println(help.toString());
        if (scanner.hasNext()) {
            String ipt = scanner.next();
            if (StringUtils.isNotEmpty(ipt)) {
                return ipt;
            }
        }
        throw new MybatisPlusException("请输入正确的" + tip + "
    }

    /**
```

Compilation completed successfully in 2 s 930 ms (2 minutes ago)

### 8.1、创建工程

pom.xml：

```xml
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0"
         xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
         xsi:schemaLocation="http://maven.apache.org/POM/4.0.0
http://maven.apache.org/xsd/maven-4.0.0.xsd">
    <modelVersion>4.0.0</modelVersion>

    <parent>
        <groupId>org.springframework.boot</groupId>
        <artifactId>spring-boot-starter-parent</artifactId>
        <version>2.1.4.RELEASE</version>
    </parent>

    <groupId>cn.itcast.mp</groupId>
    <artifactId>itcast-mp-generator</artifactId>
    <version>1.0-SNAPSHOT</version>

    <dependencies>
        <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-starter-test</artifactId>
            <scope>test</scope>
        </dependency>

        <!--mybatis-plus的springboot支持-->
        <dependency>
            <groupId>com.baomidou</groupId>
            <artifactId>mybatis-plus-boot-starter</artifactId>
            <version>3.1.1</version>
        </dependency>
        <dependency>
            <groupId>com.baomidou</groupId>
            <artifactId>mybatis-plus-generator</artifactId>
            <version>3.1.1</version>
        </dependency>
        <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-starter-freemarker</artifactId>
        </dependency>
        <!--mysql驱动-->
        <dependency>
            <groupId>mysql</groupId>
            <artifactId>mysql-connector-java</artifactId>
            <version>5.1.47</version>
        </dependency>
        <dependency>
            <groupId>org.slf4j</groupId>
            <artifactId>slf4j-log4j12</artifactId>
        </dependency>

    </dependencies>

    <build>
```

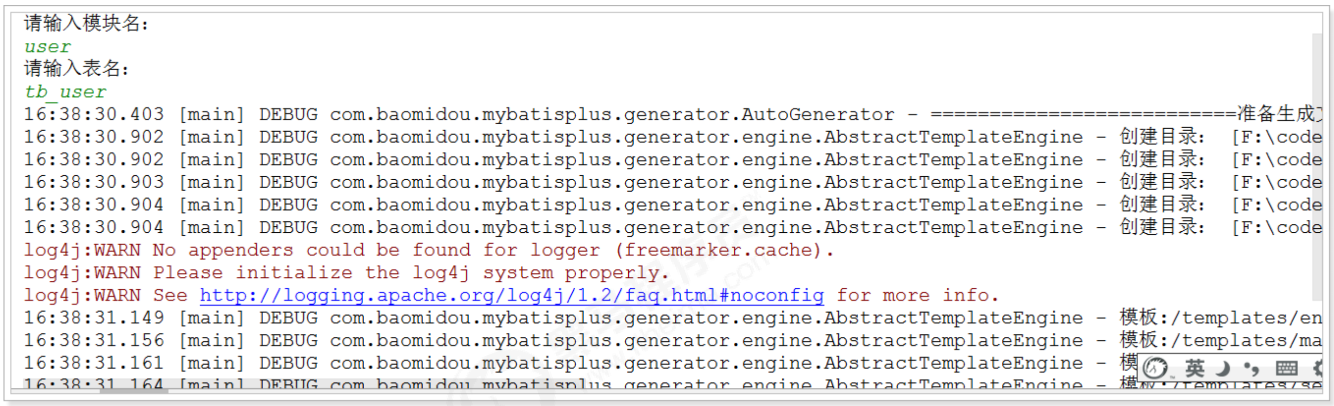
```
        <plugins>
            <plugin>
                <groupId>org.springframework.boot</groupId>
                <artifactId>spring-boot-maven-plugin</artifactId>
            </plugin>
        </plugins>
    </build>

</project>
```

### 8.2、代码

```java
package cn.itcast.mp.generator;

import java.util.ArrayList;
import java.util.List;
import java.util.Scanner;

import com.baomidou.mybatisplus.core.exceptions.MybatisPlusException;
import com.baomidou.mybatisplus.core.toolkit.StringPool;
import com.baomidou.mybatisplus.core.toolkit.StringUtils;
import com.baomidou.mybatisplus.generator.AutoGenerator;
import com.baomidou.mybatisplus.generator.InjectionConfig;
import com.baomidou.mybatisplus.generator.config.DataSourceConfig;
import com.baomidou.mybatisplus.generator.config.FileOutConfig;
import com.baomidou.mybatisplus.generator.config.GlobalConfig;
import com.baomidou.mybatisplus.generator.config.PackageConfig;
import com.baomidou.mybatisplus.generator.config.StrategyConfig;
import com.baomidou.mybatisplus.generator.config.TemplateConfig;
import com.baomidou.mybatisplus.generator.config.po.TableInfo;
import com.baomidou.mybatisplus.generator.config.rules.NamingStrategy;
import com.baomidou.mybatisplus.generator.engine.FreemarkerTemplateEngine;

/**
 * <p>
 * mysql 代码生成器演示例子
 * </p>
 */
public class MysqlGenerator {

    /**
     * <p>
     * 读取控制台内容
     * </p>
     */
    public static String scanner(String tip) {
        Scanner scanner = new Scanner(System.in);
        StringBuilder help = new StringBuilder();
        help.append("请输入" + tip + "：");
        System.out.println(help.toString());
        if (scanner.hasNext()) {
            String ipt = scanner.next();
            if (StringUtils.isNotEmpty(ipt)) {
                return ipt;
            }
        }
        throw new MybatisPlusException("请输入正确的" + tip + "！");
    }

    /**
     * RUN THIS
     */
    public static void main(String[] args) {
        // 代码生成器
        AutoGenerator mpg = new AutoGenerator();

        // 全局配置
        GlobalConfig gc = new GlobalConfig();
        String projectPath = System.getProperty("user.dir");
        gc.setOutputDir(projectPath + "/src/main/java");
        gc.setAuthor("itcast");
        gc.setOpen(false);
        mpg.setGlobalConfig(gc);

        // 数据源配置
        DataSourceConfig dsc = new DataSourceConfig();
        dsc.setUrl("jdbc:mysql://127.0.0.1:3306/mp?
useUnicode=true&useSSL=false&characterEncoding=utf8");
        // dsc.setSchemaName("public");
        dsc.setDriverName("com.mysql.jdbc.Driver");
        dsc.setUsername("root");
        dsc.setPassword("root");
        mpg.setDataSource(dsc);

        // 包配置
        PackageConfig pc = new PackageConfig();
        pc.setModuleName(scanner("模块名"));
        pc.setParent("cn.itcast.mp.generator");
        mpg.setPackageInfo(pc);

        // 自定义配置
        InjectionConfig cfg = new InjectionConfig() {
            @Override
            public void initMap() {
                // to do nothing
            }
        };
        List<FileOutConfig> focList = new ArrayList<>();
        focList.add(new FileOutConfig("/templates/mapper.xml.ftl") {
            @Override
            public String outputFile(TableInfo tableInfo) {
                // 自定义输入文件名称
                return projectPath + "/itcast-mp-
generator/src/main/resources/mapper/" + pc.getModuleName()
```

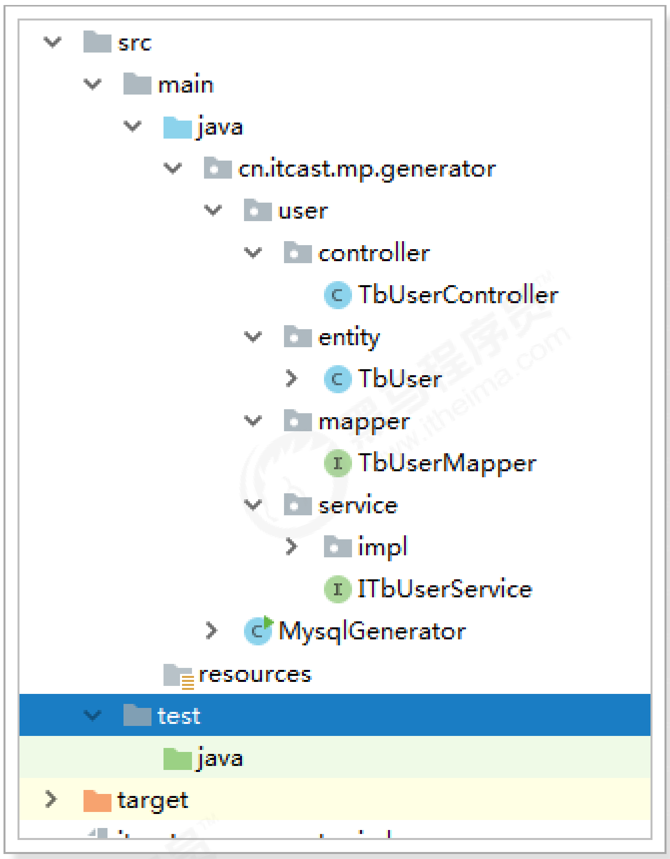
```
                        + "/" + tableInfo.getEntityName() + "Mapper" + StringPool.DOT_XML;
            }
        });
        cfg.setFileOutConfigList(focList);
        mpg.setCfg(cfg);
        mpg.setTemplate(new TemplateConfig().setXml(null));

        // 策略配置
        StrategyConfig strategy = new StrategyConfig();
        strategy.setNaming(NamingStrategy.underline_to_camel);
        strategy.setColumnNaming(NamingStrategy.underline_to_camel);
//        strategy.setSuperEntityClass("com.baomidou.mybatisplus.samples.generator.common.BaseEntity");
        strategy.setEntityLombokModel(true);
//        strategy.setSuperControllerClass("com.baomidou.mybatisplus.samples.generator.common.BaseController");
        strategy.setInclude(scanner("表名"));
        strategy.setSuperEntityColumns("id");
        strategy.setControllerMappingHyphenStyle(true);
        strategy.setTablePrefix(pc.getModuleName() + "_");
        mpg.setStrategy(strategy);
        // 选择 freemarker 引擎需要指定如下加，注意 pom 依赖必须有！
        mpg.setTemplateEngine(new FreemarkerTemplateEngine());
        mpg.execute();
    }

}
```

## 8.3、测试



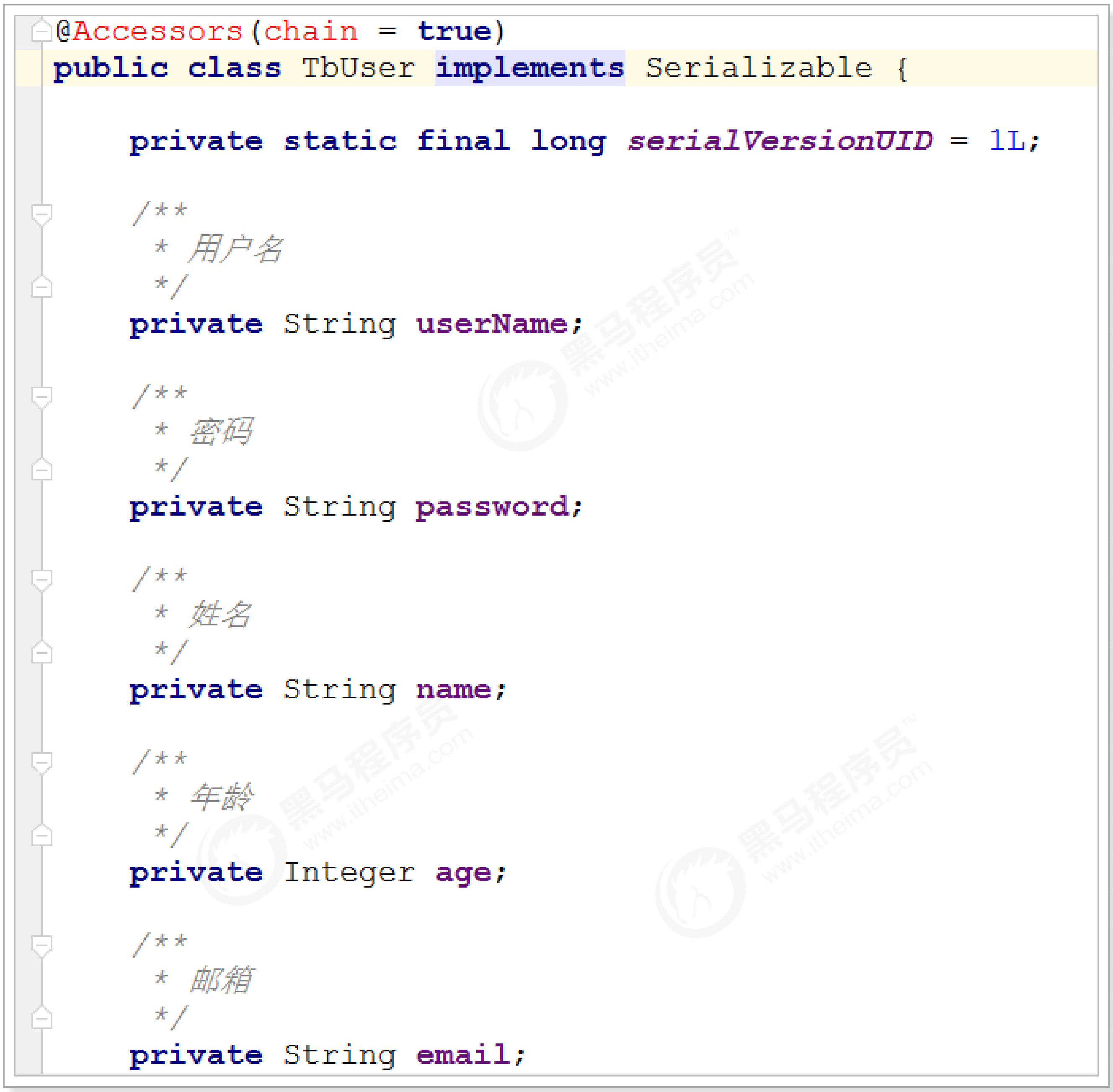
```
请输入模块名：
user
请输入表名：
tb_user
16:38:30.403 [main] DEBUG com.baomidou.mybatisplus.generator.AutoGenerator - ==========================准备生成
16:38:30.902 [main] DEBUG com.baomidou.mybatisplus.generator.engine.AbstractTemplateEngine - 创建目录：  [F:\code
16:38:30.902 [main] DEBUG com.baomidou.mybatisplus.generator.engine.AbstractTemplateEngine - 创建目录：  [F:\code
16:38:30.903 [main] DEBUG com.baomidou.mybatisplus.generator.engine.AbstractTemplateEngine - 创建目录：  [F:\code
16:38:30.904 [main] DEBUG com.baomidou.mybatisplus.generator.engine.AbstractTemplateEngine - 创建目录：  [F:\code
16:38:30.904 [main] DEBUG com.baomidou.mybatisplus.generator.engine.AbstractTemplateEngine - 创建目录：  [F:\code
log4j:WARN No appenders could be found for logger (freemarker.cache).
log4j:WARN Please initialize the log4j system properly.
log4j:WARN See http://logging.apache.org/log4j/1.2/faq.html#noconfig for more info.
16:38:31.149 [main] DEBUG com.baomidou.mybatisplus.generator.engine.AbstractTemplateEngine - 模板:/templates/en
16:38:31.156 [main] DEBUG com.baomidou.mybatisplus.generator.engine.AbstractTemplateEngine - 模板:/templates/ma
16:38:31.161 [main] DEBUG com.baomidou.mybatisplus.generator.engine.AbstractTemplateEngine - 模
16:38:31.164 [main] DEBUG com.baomidou.mybatisplus.generator.engine.AbstractTemplateEngine - 模板:/templates/se
```

代码已生成：



```
src
  main
    java
      cn.itcast.mp.generator
        user
          controller
            TbUserController
          entity
            TbUser
          mapper
            TbUserMapper
          service
            impl
            ITbUserService
        MysqlGenerator
    resources
  test
    java
target
```

实体对象：



```java
@Accessors(chain = true)
public class TbUser implements Serializable {

    private static final long serialVersionUID = 1L;

    /**
     * 用户名
     */
    private String userName;

    /**
     * 密码
     */
    private String password;

    /**
     * 姓名
     */
    private String name;

    /**
     * 年龄
     */
    private Integer age;

    /**
     * 邮箱
     */
    private String email;
```

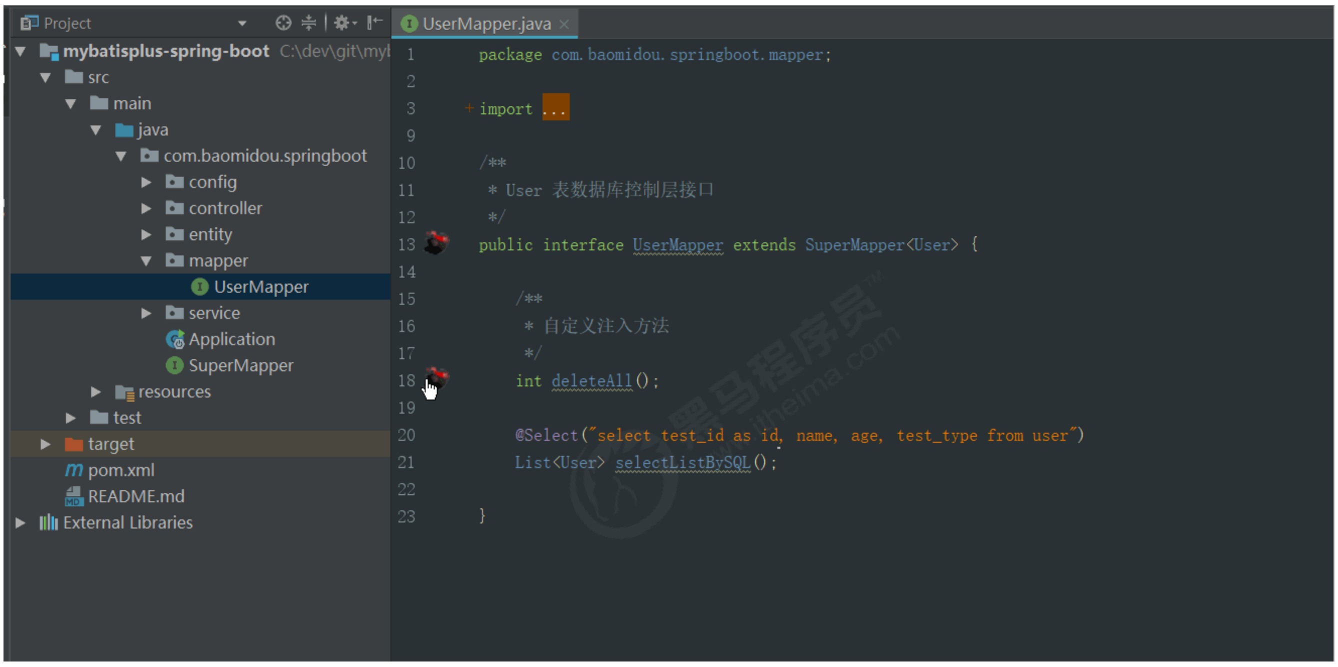
## 9、MybatisX 快速开发插件

MybatisX 是一款基于 IDEA 的快速开发插件，为效率而生。

安装方法：打开 IDEA，进入 File -> Settings -> Plugins -> Browse Repositories，输入 `mybatisx` 搜索并安装。

功能：

- Java 与 XML 调回跳转
- Mapper 方法自动生成 XML



```java
package com.baomidou.springboot.mapper;

import ...

/**
 * User 表数据库控制层接口
 */
public interface UserMapper extends SuperMapper<User> {

    /**
     * 自定义注入方法
     */
    int deleteAll();

    @Select("select test_id as id, name, age, test_type from user")
    List<User> selectListBySQL();

}
```