# Spring + Mybatis + CXF Restful服务

## 配置

### 1. maven项目的 pom.xml配置。

主要添加一些package： c3p0 + spring + cxf + mysql-connector 等

**代码:**

```
<properties>
  <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
  <maven.compiler.source>1.7</maven.compiler.source>
  <maven.compiler.target>1.7</maven.compiler.target>
  <spring.version>4.3.14.RELEASE</spring.version>
  <cxf.version>3.1.11</cxf.version>
  <c3p0.version>0.9.5.2</c3p0.version>
  <mysql-connector-java.version>5.1.45</mysql-connector-java.version>
  <mybatis-spring.version>1.3.1</mybatis-spring.version>
  <mybatis.version>3.4.5</mybatis.version>
</properties>

<dependencies>
  <!-- c3p0 -->
  <dependency>
    <groupId>com.mchange</groupId>
    <artifactId>c3p0</artifactId>
    <version>${c3p0.version}</version>
  </dependency>

  <!-- mysql-connector -->
  <dependency>
    <groupId>mysql</groupId>
    <artifactId>mysql-connector-java</artifactId>
    <version>${mysql-connector-java.version}</version>
  </dependency>

  <!-- spring -->
  <dependency>
    <groupId>org.springframework</groupId>
    <artifactId>spring-orm</artifactId>
    <version>${spring.version}</version>
  </dependency>
  <dependency>
```

```
      <groupId>org.springframework</groupId>
      <artifactId>spring-context</artifactId>
      <version>${spring.version}</version>
    </dependency>
    <dependency>
      <groupId>org.springframework</groupId>
      <artifactId>spring-core</artifactId>
      <version>${spring.version}</version>
    </dependency>
    <dependency>
      <groupId>org.springframework</groupId>
      <artifactId>spring-web</artifactId>
      <version>${spring.version}</version>
    </dependency>
    <dependency>
      <groupId>org.springframework</groupId>
      <artifactId>spring-aop</artifactId>
      <version>${spring.version}</version>
    </dependency>
    <!-- spring end.  -->

    <!-- mybatis-spring -->
    <dependency>
      <groupId>org.mybatis</groupId>
      <artifactId>mybatis-spring</artifactId>
      <version>${mybatis-spring.version}</version>
    </dependency>
    <dependency>
      <groupId>org.mybatis</groupId>
      <artifactId>mybatis</artifactId>
      <version>${mybatis.version}</version>
    </dependency>

    <!-- cxf -->
    <dependency>
      <groupId>org.apache.cxf</groupId>
      <artifactId>cxf-rt-frontend-jaxrs</artifactId>
      <version>${cxf.version}</version>
    </dependency>
    <dependency>
      <groupId>org.apache.cxf</groupId>
      <artifactId>cxf-rt-rs-client</artifactId>
      <version>${cxf.version}</version>
    </dependency>
    <!-- cxf end. -->

    <!-- json -->
    <dependency>
```

```
      <groupId>com.alibaba</groupId>
      <artifactId>fastjson</artifactId>
      <version>1.2.41</version>
    </dependency>
    <dependency>
      <groupId>org.codehaus.jackson</groupId>
      <artifactId>jackson-jaxrs</artifactId>
      <version>1.2.1</version>
    </dependency>

    <dependency>
      <groupId>javax.ws.rs</groupId>
      <artifactId>jsr311-api</artifactId>
      <version>1.1.1</version>
    </dependency>

    <dependency>
      <groupId>javax.servlet</groupId>
      <artifactId>javax.servlet-api</artifactId>
      <version>4.0.0-b01</version>
    </dependency>

    <dependency>
      <groupId>junit</groupId>
      <artifactId>junit</artifactId>
      <version>4.12</version>
      <scope>test</scope>
    </dependency>
  </dependencies>
```

## 2. Spring 基本配置 applicatoncontext.xml

- 1.利用Spring自动扫描，创建Bean
- 2.Spring提供了Properties机制，加入项目的配置文件:students-info-restful.properties
- 3.配置c3p0数据库连接池，管理数据库连接。
- 4.Spring配置MyBatis连接数据库

**代码:**

```
    <import resource="spring-cxf-restful.xml"/>
    <!-- 使用注解式注入 -->
    <context:annotation-config />
    <!-- 自动扫描 -->
    <context:component-scan base-package="org.ppp" />
    <bean class="org.springframework.beans.factory.annotation.AutowiredAnnotationB
eanPostProcessor"/>
```

```xml
    <!--调用restful服务端-->
    <bean id="webClient" class="org.apache.cxf.jaxrs.client.WebClient" factory-method="create">
        <constructor-arg type="java.lang.String" value="http://localhost:8080/students-info-restful/" />
    </bean>

    <!-- for properties -->
    <bean id="propertyConfigurer" class="org.springframework.beans.factory.config.PropertyPlaceholderConfigurer">
        <property name="fileEncoding" value="utf-8" />
        <property name="locations">
            <list>
                <value>classpath*:students-info-restful.properties</value>
            </list>
        </property>
    </bean>

    <!-- for database -->
    <bean id="dataSource" class="com.mchange.v2.c3p0.ComboPooledDataSource"  destroy-method="close">
        <property name="driverClass" value="${students.info.db.driverClass}" />
        <property name="jdbcUrl" value="${students.info.db.url}" />
        <property name="user" value="${students.info.db.user}" />
        <property name="password" value="${students.info.db.password}" />
        <property name="initialPoolSize" value="3" />
        <property name="minPoolSize" value="2" />
        <property name="maxPoolSize" value="10" />
        <property name="maxIdleTime" value="60" />
        <property name="acquireRetryDelay" value="1000" />
        <property name="acquireRetryAttempts" value="10" />
        <property name="preferredTestQuery" value="SELECT 1" />
    </bean>

    <bean id="sqlSessionFactory" class="org.mybatis.spring.SqlSessionFactoryBean">
        <property name="dataSource" ref="dataSource" />
        <property name="mapperLocations" value="classpath:mybatis-mapper/*.xml"/>
    </bean>

    <bean class="org.mybatis.spring.mapper.MapperScannerConfigurer">
        <property name="sqlSessionFactoryBeanName" value="sqlSessionFactory"/>
        <property name="basePackage" value="org.ppp.dao" />
    </bean>
</beans>
```

## 3.Spring 整合 CXF spring-cxf-restful.xml

**代码:**

```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:jaxrs="http://cxf.apache.org/jaxrs"
       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
       http://cxf.apache.org/jaxrs
       http://cxf.apache.org/schemas/jaxrs.xsd">

    <!-- 使用注解式注入 -->
    <context:annotation-config />
    <!-- 自动扫描 -->
    <context:component-scan base-package="org.ppp" />

    <bean id="student" class="org.ppp.service.impl.StudentServiceImpl"></bean>
    <jaxrs:server address="/" id="StudentService">
        <jaxrs:serviceBeans>
            <ref bean="student"/>
        </jaxrs:serviceBeans>

        <jaxrs:providers>
            <bean class="org.codehaus.jackson.jaxrs.JacksonJsonProvider" />
            <bean class="org.apache.cxf.jaxrs.provider.JAXBElementProvider" />
        </jaxrs:providers>
    </jaxrs:server>

</beans>
```

# 设计

使用分层设计模式:

- 1.设计Model层，存放实体Bean对象
- 2.设计Service层。利用RESTFul接口
- 3.使用MyBatis机制，设计Dao接口层
- 4.数据库表设计时，保持不删除，使用字段deleted=1表示删除

### 1. model层实体类设计 Student.java

```java
package org.ppp.model;

public class Student {
    private int id;
    private String studentNum;
    private String studentName;
    private int gender;
    private int age;
    private String address;
    private String major;
    private int deleted;

    // getXXX(), setXXX()
}
```

## 2.1 学生服务接口 IStudentService.java

- 1.由于项目比较简单，直接省略了Controller层，设计Service层。
- 2.使用接口，帮忙后期的RPC管理和调用

```
@Path(value = "/student")
public interface IStudentService {

    /**
     * 根据学生学号查询学生信息
     * @param studentNum 学生学号
     * @return
     */
    @GET
    @Path(value = "/findStuByNum/{studentNum}")
    @Produces(MediaType.APPLICATION_JSON)
    public String findStuByNum(@PathParam("studentNum") String  studentNum);

    /**
     * 增加一个学生信息
     * @param student 学生对象
     */
    @POST
    @Path("/addStu")
    @Produces({MediaType.APPLICATION_XML,MediaType.APPLICATION_JSON})
    public void addStu(Student student);

    /**
     * 删除一个学生信息
     * @param studentNum 学生学号
     */
    @DELETE
    @Path("/deleteStu/{studentNum}")
    public void deleteStu(@PathParam("studentNum") String studentNum);

}
```

### 2.2 学生服务实现 StudentServiceImpl.java

```
public class StudentServiceImpl implements IStudentService {
    @Context
    private UriInfo uriInfo;

    @Context
    private Request request;

    @Resource
    private StudentDao studentDao;

    @GET
    @Path(value = "/findStuByNum/{studentNum}")
    @Produces(MediaType.APPLICATION_JSON)
    public String findStuByNum(@PathParam("studentNum") String  studentNum) {
        Student student = studentDao.findByStudentNum(studentNum);
        return JSON.toJSONString(student);
    }

    @POST
    @Path("/addStu")
    @Produces({MediaType.APPLICATION_XML,MediaType.APPLICATION_JSON})
    public void addStu(Student student) {

    }

    @DELETE
    @Path("/deleteStu/{studentNum}")
    public void deleteStu(@PathParam("studentNum") String studentNum) {

    }
}
```

## 3. MyBatis中Dao层设计

**代码:**

```
public interface StudentDao {
    public Student findByStudentNum(@Param("studentNum")  String studentNum);

    public void addStu(Student student);

    public void deleteStu(@Param("studentNum")  String studentNum);

}
```

### 3.1 mybatis-mapper设计

**代码:**

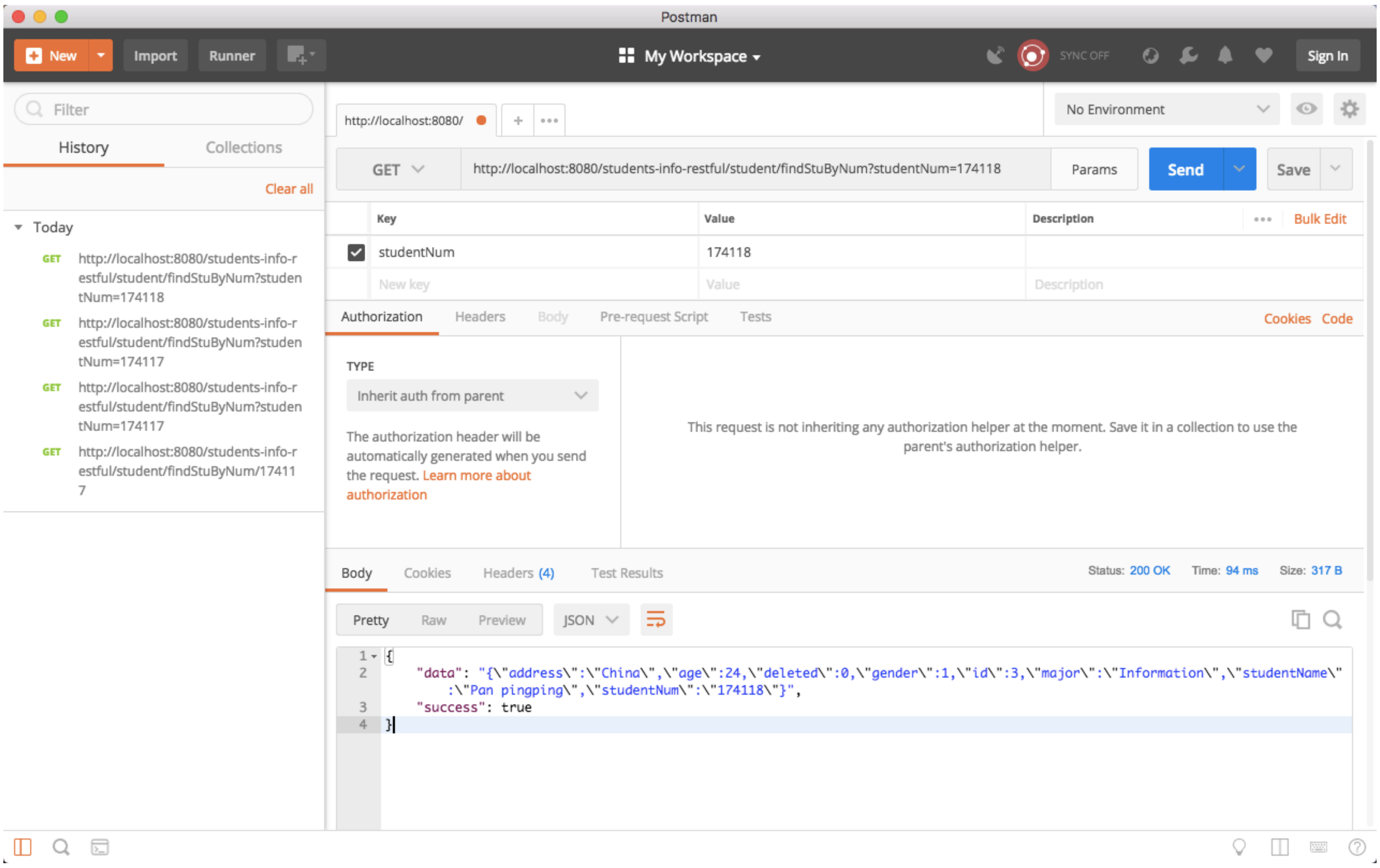
```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE mapper PUBLIC "-//mybatis.org//DTD Mapper 3.0//EN"
        "http://mybatis.org/dtd/mybatis-3-mapper.dtd">
<mapper namespace="org.ppp.dao.StudentDao">
    <resultMap id="Student" type="org.ppp.model.Student">
        <result column="id" property="id" />
        <result column="student_num" property="studentNum" />
        <result column="student_name" property="studentName" />
        <result column="gender" property="gender" />
        <result column="age" property="age" />
        <result column="address" property="address" />
        <result column="major" property="major" />
        <result column="deleted" property="deleted" />
    </resultMap>

    <sql id="Base_Column_List">
        t.id,
        t.student_num,
        t.student_name,
        t.gender,
        t.age,
        t.address,
        t.major,
        t.deleted
    </sql>

    <select id="findByStudentNum" parameterType="java.lang.String" resultMap="Stud
ent">
        SELECT <include refid="Base_Column_List" />
        FROM STUDENT AS t
        WHERE t.student_num = #{studentNum} and deleted = 0;
    </select>

    <insert id="addStu" parameterType="org.ppp.model.Student" useGeneratedKeys="tr
ue" keyProperty="id">
        INSERT INTO STUDENT ('student_num', 'student_name', 'gender', 'age', 'addr
ess', 'major', 'deleted')
        VALUES (#{studentNum}, #{studentName}, #{gender}, #{age}, #{address}, #{ma
jor}, #{deleted});
    </insert>

    <update id="deleteStu" parameterType="java.lang.String">
        UPDATE STUDENT As t
        SET t.deleted = 1
        WHERE t.student_num = #{studentNum};
    </update>
```

```
</mapper>
```

## 测试：

使用PostMan接口测试

### 1. 查询学生信息接口 - 测试



GET http://localhost:8080/students-info-restful/student/findStuByNum?studentNum=174118

| Key | Value | Description |
|---|---|---|
| studentNum | 174118 | |

History:

- GET http://localhost:8080/students-info-restful/student/findStuByNum?studentNum=174118
- GET http://localhost:8080/students-info-restful/student/findStuByNum?studentNum=174117
- GET http://localhost:8080/students-info-restful/student/findStuByNum?studentNum=174117
- GET http://localhost:8080/students-info-restful/student/findStuByNum/174117

TYPE: Inherit auth from parent

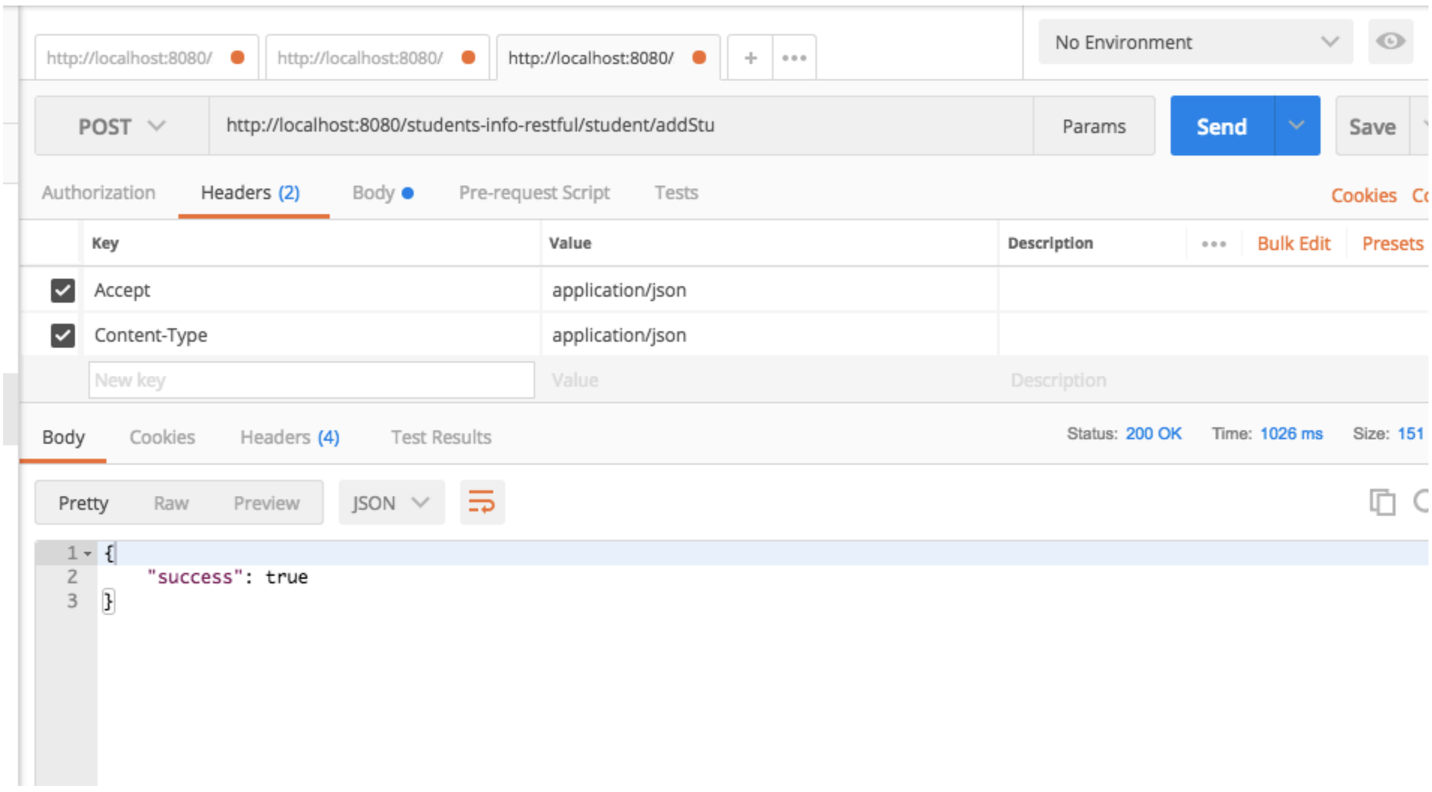
The authorization header will be automatically generated when you send the request. Learn more about authorization

This request is not inheriting any authorization helper at the moment. Save it in a collection to use the parent's authorization helper.

Status: 200 OK Time: 94 ms Size: 317 B

```
{
    "data": "{\"address\":\"China\",\"age\":24,\"deleted\":0,\"gender\":1,\"id\":3,\"major\":\"Information\",\"studentName\"
        :\"Pan pingping\",\"studentNum\":\"174118\"}",
    "success": true
}
```

### 2. 添加学生接口 - 测试



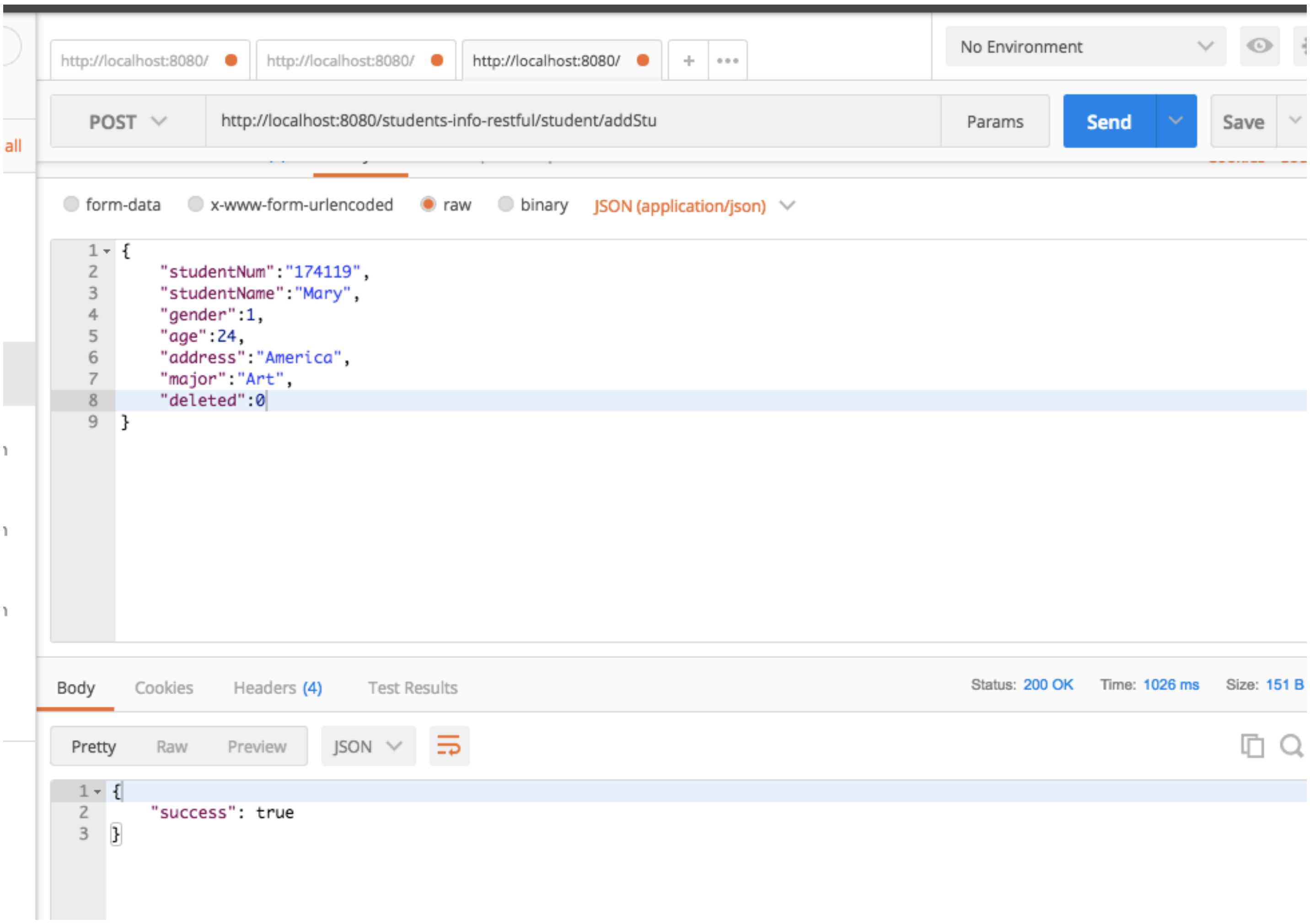
POST http://localhost:8080/students-info-restful/student/addStu

Headers (2)

| Key | Value | Description |
|---|---|---|
| ✓ Accept | application/json | |
| ✓ Content-Type | application/json | |

Status: 200 OK Time: 1026 ms Size: 151

```
{
    "success": true
}
```



POST http://localhost:8080/students-info-restful/student/addStu

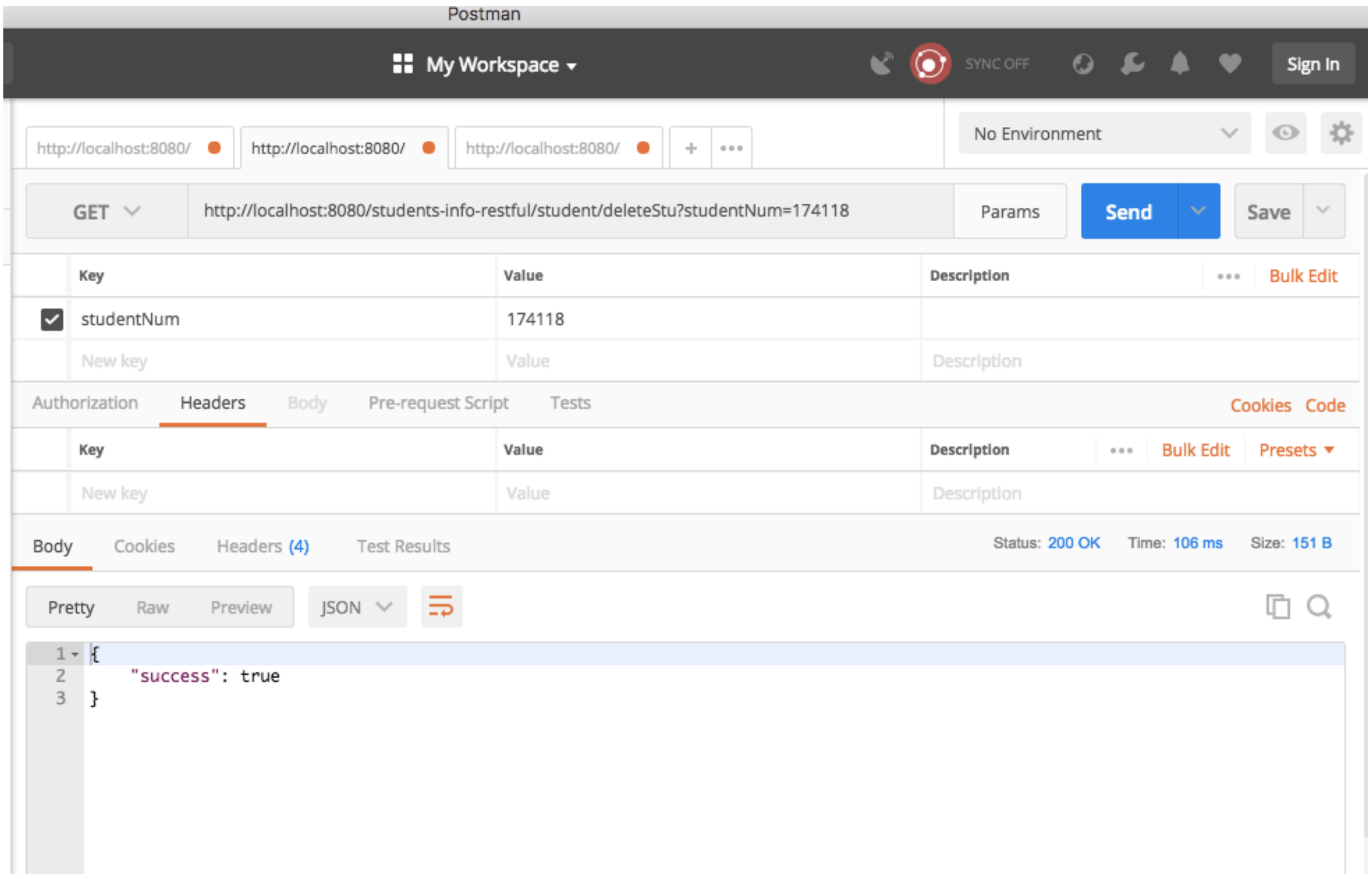
raw JSON (application/json)

```
{
    "studentNum":"174119",
    "studentName":"Mary",
    "gender":1,
    "age":24,
    "address":"America",
    "major":"Art",
    "deleted":0
}
```

Status: 200 OK Time: 1026 ms Size: 151 B

```
{
    "success": true
}
```

## 3. 删除学生接口 - 测试



GET http://localhost:8080/students-info-restful/student/deleteStu?studentNum=174118

| Key | Value | Description |
|---|---|---|
| ✓ studentNum | 174118 | |

Status: 200 OK Time: 106 ms Size: 151 B

```
{
    "success": true
}
```