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About Siva Reddy

Katamreddy Siva Prasad is a Senior Softw are Engineer w orking in E-Commerce domain. His areas of interest include Object Oriented Design, SOLID Design principles, RESTful WebServices and OpenSource softwares including Spring, MyBatis and .lenkins





MyBatis Tutorial – CRUD Operations and Mapping **Relationships – Part 1**

by Siva Reddy on November 16th, 2012 | Filed in: Enterprise Java Tags: MyBatis



CRUD Operations

MyBatis is an SQL Mapper tool which greatly simplifies the database programing when compared to using JDBC directly.



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Step1: Create a Maven project and configure MyBatis dependencies

```
02
   http://maven.apache.org/xsd/maven-4.0.0.xsd'>
    <modelVersion>4.0.0</modelVersion>
    <groupId>com.sivalabs
    <artifactId>mybatis-demo</artifactId>
<version>0.0.1-SNAPSHOT</version>
    <packaging>jar</packaging>
    <name>mybatis-demo</name>
    <url>http://maven.apache.org</url>
    <build>
     <plugins>
       <plugin>
       <groupId>org.apache.maven.plugins
       <artifactId>maven-compiler-plugin</artifactId>
       <version>2.3.2
       <configuration>
        <source>1.6</source>
        <target>1.6</target>
        <encoding>${project.build.sourceEncoding}</encoding>
        </configuration>
      </plugin>
    </build>
    <dependencies>
     <dependency>
      <groupId>junit
      <artifactId>junit</artifactId>
<version>4.10</version>
       scope>test</scope>
     </dependency>
44
     <dependency>
         <groupId>org.mybatis</groupId>
<artifactId>mybatis</artifactId>
45
46
          <version>3.1.1
48
     </dependency>
     <dependency>
50
                <groupId>mysql</groupId>
                <artifactId>mysql-connector-java</artifactId>
<version>5.1.21</version>
                <scope>runtime</scope>
```

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```
54 </dependency>
55 </dependencies>
56 </project>
```

Step#2: Create the table USER and a Java domain Object User as follows:

Step#3: Create MyBatis configuration files.

//setters and getters

a) Create jdbc.properties file in src/main/resources folder

```
1 | jdbc.driverClassName=com.mysql.jdbc.Driver
2 | jdbc.url=jdbc:mysql://localhost:3306/mybatis-demo
3 | jdbc.username=root
4 | jdbc.password=admin
```

b) Create mybatis-config.xml file in src/main/resources folder

```
<?xml version='1.0' encoding='UTF-8' ?>
    cram version= 1.0 enough= 01F-0 ?>
clootType configuration
   PUBLIC '-/mybatis.org/DTD Config 3.0/EN'
   'http://mybatis.org/dtd/mybatis-3-config.dtd'>
02
     <configuration>
cproperties resource='jdbc.properties'/>
      <typeAliases>
       <typeAlias type='com.sivalabs.mybatisdemo.domain.User' alias='User</pre>
     </typeAliases>
<environments default='development'>
      15
16
       </environment>
20
       </environments>
       <mappers>
      <mapper resource='com/sivalabs/mybatisdemo/mappers/UserMapper.xml'/>
       </manners>
    </configuration>
```

Step#4: Create an interface UserMapper.java in src/main/java folder in com.sivalabs.mybatisdemo.mappers package.

```
package com.sivalabs.mybatisdemo.mappers;
import java.util.List;
import com.sivalabs.mybatisdemo.domain.User;

public interface UserMapper
{
    public void insertUser(User user);
    public User getUserById(Integer userId);
    public List<User> getAllUsers();
    public void updateUser(User user);
    public void deleteUser(Integer userId);
    public void deleteUser(Integer userId);
}
```

Step#5: Create UserMapper.xml file in src/main/resources folder in com.sivalabs.mybatisdemo.mappers package.

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```
<?xml version='1.0' encoding='UTF-8' ?>
<!DOCTYPE mapper PUBLIC '-//mybatis.org//DTD Mapper 3.0//EN'</pre>
02
         http://mybatis.org/dtd/mybatis-3-mapper.dtd'
94
     <mapper namespace='com.sivalabs.mybatisdemo.mappers.UserMapper'>
06
        <select id='getUserById' parameterType='int' resultType='com.sivalabs.mybatisdemo.domain.User'>
            SELECT
             user_id as userId,
email_id as emailId,
password,
first_name as firstName,
last_name as lastName
            FROM LISER
             WHERE USER_ID = #{userId}
       </select>
<!-- Instead of referencing Fully Qualified Class Names we can register Aliases in mybatis-</pre>
     </resultMap>
        <select id='getAllUsers' resultMap='UserResult'>
SELECT * FROM USER
        </select>
        <insert id='insertUser' parameterType='User' useGeneratedKeys='true' keyProperty='userId'>
INSERT INTO USER(email_id, password, first_name, last_name)
VALUES(#{emailId}, #{password}, #{firstName}, #{lastName})
        </insert>
        <update id='updateUser' parameterType='User'>
           UPDATE USER
           SET
           PASSWORD= #{password},
FIRST_NAME = #{firstName},
LAST_NAME = #{lastName}
WHERE USER_ID = #{userId}
       </update>
44
        <delete id='deleteUser' parameterType='int'>
DELETE FROM USER WHERE USER_ID = #{userId}
46
48 </mapper>
```

Step#6: Create MyBatisUtil.java to instantiate SqlSessionFactory.

```
package com.sivalabs.mybatisdemo.service;
    import java.io.IOException;
04
05
    import java.io.Reader;
import org.apache.ibatis.io.Resources;
    import org.apache.ibatis.session.SqlSessionFactory;
    {\color{blue} \textbf{import}} \ \text{org.apache.ibatis.session.SqlSessionFactoryBuilder};
    public class MyBatisUtil
     private static SqlSessionFactory factory;
    private MyBatisUtil() {
}
     static
      Reader reader = null;
       reader = Resources.getResourceAsReader('mybatis-config.xml');
      } catch (IOException e) {
       throw new RuntimeException(e.getMessage());
24
25
      factory = new SqlSessionFactoryBuilder().build(reader);
     public static SqlSessionFactory getSqlSessionFactory()
      return factory;
```

Step#7: Create UserService.java in src/main/java folder.

```
package com.sivalabs.mybatisdemo.service;

import java.util.List;
import org.apache.ibatis.session.SqlSession;
import com.sivalabs.mybatisdemo.domain.User;
import com.sivalabs.mybatisdemo.mappers.UserMapper;

public class UserService
{

public void insertUser(User user) {
    SqlSession sqlSession = MyBatisUtil.getSqlSessionFactory().openSession();
    try{
    UserMapper userMapper = sqlSession.getMapper(UserMapper.class);
    userMapper.insertUser(user);
```

```
sqlSession.commit();
        }finally{
         sqlSession.close();
       public User getUserById(Integer userId) {
   SqlSession sqlSession = MyBatisUtil.getSqlSessionFactory().openSession();
24
25
        UserMapper userMapper = sqlSession.getMapper(UserMapper.class);
return userMapper.getUserById(userId);
26
        }finally{
28
29
         sqlSession.close();
30
       public List<User> getAllUsers() {
   SqlSession sqlSession = MyBatisUtil.getSqlSessionFactory().openSession();
34
35
        UserMapper userMapper = sqlSession.getMapper(UserMapper.class);
        return userMapper.getAllUsers();
}finally{
36
37
38
         sqlSession.close();
40
       }
41
42
43
       public void updateUser(User user) {
   SqlSession sqlSession = MyBatisUtil.getSqlSessionFactory().openSession();
44
45
        UserMapper userMapper = sqlSession.getMapper(UserMapper.class);
        userMapper.updateUser(user);
sqlSession.commit();
46
47
48
49
       }finally{
sqlSession.close();
50
51
       }
54
       public void deleteUser(Integer userId) {
   SqlSession sqlSession = MyBatisUtil.getSqlSessionFactory().openSession();
56
57
58
59
        try{
UserMapper userMapper = sqlSession.getMapper(UserMapper.class);
        userMapper.deleteUser(userId);
       sqlSession.commit();
}finally{
         sqlSession.close();
       }
      }
66
```

Step#8: Create a JUnit Test class to test UserService methods.

```
package com.sivalabs.mybatisdemo;
02
     import java.util.List;
94
     import org.junit.AfterClass;
     import org.junit.Assert;
import org.junit.BeforeClass;
06
07
    import org.junit.Test;
10
    import com.sivalabs.mybatisdemo.domain.User;
import com.sivalabs.mybatisdemo.service.UserService;
12
13
14
15
16
     public class UserServiceTest
      private static UserService userService;
        public static void setup()
       userService = new UserService();
      @AfterClass
        public static void teardown()
       userService = null;
      public void testGetUserById()
       User user = userService.getUserById(1)
       Assert.assertNotNull(user);
 34
       System.out.println(user);
         public void testGetAllUsers()
 39
40
       List<User> users = userService.getAllUsers();
       Assert.assertNotNull(users);
for (User user : users)
 41
42
 43
44
        System.out.println(user);
 45
 46
 48
 50
          public void testInsertUser()
```

```
User user = new User();
              user.setEmailId('test_email_'+System.currentTimeMillis()+'@gmail.com');
user.setPassword('secret');
user.setFirstName('TestFirstName');
user.setLastName('TestLastName');
              userService.insertUser(user);
         Assert.assertTrue(user.getUserId() != 0);
User createdUser = userService.getUserById(user.getUserId());
Assert.assertNotNull(createdUser);
          Assert.assertEquals(user.getEmailId(), createdUser.getEmailId());
         Assert.assertEquals(user.getPassword()), createdUser.getPassword());
Assert.assertEquals(user.getFirstName()), createdUser.getFirstName());
65
         Assert.assertEquals(user.getLastName(), createdUser.getLastName());
66
68
70
             public void testUpdateUser()
         long timestamp = System.currentTimeMillis();
User user = userService.getUserById(2);
user.setFirstName('TestFirstName'+timestamp);
user.setLastName('TestLastName'+timestamp);
              userService.updateUser(user);
         User updatedUser = userService.getUserById(2);
         Assert.assertEquals(user.getFirstName(), updatedUser.getFirstName());
Assert.assertEquals(user.getLastName(), updatedUser.getLastName());
78
80
81
           public void testDeleteUser()
              User user = userService.getUserById(4);
         userService.deleteUser(user.getUserId());
User deletedUser = userService.getUserById(4);
86
87
88
         Assert.assertNull(deletedUser);
90
91
       }
```

Now, I will explain how to perform CRUD operations using MyBatis Annotation support without need of Queries configuration in XML mapper files.

Step#1: Create a table BLOG and a java domain Object Blog.

```
CREATE TABLE blog (
blog_id int(10) unsigned NOT NULL auto_increment,
blog_name varchar(45) NOT NULL,
created_on datetime NOT NULL,
PRIMARY KEY (blog_id)
bending in bending in
```

Step#2: Create UserMapper.iava interface with SQL queries in Annotations

16 17 }

//Seeters and getters

```
package com.sivalabs.mybatisdemo.mappers;
02
    import java.util.List;
    import org.apache.ibatis.annotations.Delete;
    import org.apache.ibatis.annotations.Insert;
    import org.apache.ibatis.annotations.Options
import org.apache.ibatis.annotations.Result;
    import org.apache.ibatis.annotations.Results;
10
    import org.apache.ibatis.annotations.Select;
    import org.apache.ibatis.annotations.Update;
    import com.sivalabs.mybatisdemo.domain.Blog;
    public interface BlogMapper
{
     @Insert('INSERT INTO BLOG(BLOG_NAME, CREATED_ON) VALUES(#{blogName}, #{createdOn})')
@Options(useGeneratedKeys=true, keyProperty='blogId')
     public void insertBlog(Blog blog);
     @Select('SELECT BLOG_ID AS blogId, BLOG_NAME as blogName, CREATED_ON as createdOn FROM BLOG WHERE
     BLOG_ID=#{blogId}')
public Blog getBlogById(Integer blogId);
23
24
     @Select('SELECT * FROM BLOG ')
     @Results({
      @Result(id=true, property='blogId', column='BLOG_ID'),
```

```
@Result(property='blogName', column='BLOG_NAME'),
    @Result(property='createdOn', column='CREATED_ON')
})
public List<Blog> getAllBlogs();

@Update('UPDATE BLOG SET BLOG_NAME=#{blogName}, CREATED_ON=#{createdOn} WHERE BLOG_ID=#{blogId}')
public void updateBlog(Blog blog);

@Delete('DELETE FROM BLOG WHERE BLOG_ID=#{blogId}')
public void deleteBlog(Integer blogId);

}
```

Step#3: Configure BlogMapper in mybatis-config.xml

```
<?xml version='1.0' encoding='UTF-8' ?>
    <?xml version= 1.0 through 5...
<!DOCTYPE configuration
PUBLIC '-/mybatis.org//DTD Config 3.0//EN'
'http://mybatis.org/dtd/mybatis-3-config.dtd'>
02
     <configuration>
     resource='jdbc.properties'/>
     <environments default='development'>
<environment id='development'>
       10
16
18
         </dataSource>
20
      </environment>
       </environments>
      <mappers>
         <mapper class='com.sivalabs.mybatisdemo.mappers.BlogMapper'/>
      </mappers>
    </configuration>
```

Step#4: Create BlogService.java

```
package com.sivalabs.mybatisdemo.service;
     import java.util.List;
     import org.apache.ibatis.session.SqlSession;
06
07
     import com.sivalabs.mybatisdemo.domain.Blog;
08
     import com.sivalabs.mybatisdemo.mappers.BlogMapper;
10
11
     public class BlogService
      public void insertBlog(Blog blog)
       SqlSession sqlSession = MyBatisUtil.getSqlSessionFactory().openSession()
       BlogMapper blogMapper = sqlSession.getMapper(BlogMapper.class);
       blogMapper.insertBlog(blog);
18
       sqlSession.commit();
       }finally{
        sqlSession.close();
     }
      public Blog getBlogById(Integer blogId) {
   SqlSession sqlSession = MyBatisUtil.getSqlSessionFactory().openSession();
26
27
       BlogMapper blogMapper = sqlSession.getMapper(BlogMapper.class);
       return blogMapper.getBlogById(blogId);
}finally{
        sqlSession.close();
     }
33
34
      public List<Blog> getAllBlogs() {
   SqlSession sqlSession = MyBatisUtil.getSqlSessionFactory().openSession();
       BlogMapper blogMapper = sqlSession.getMapper(BlogMapper.class);
return blogMapper.getAllBlogs();
       }finally{
sqlSession.close();
39
40
41
42
      public void updateBlog(Blog blog) {
   SqlSession sqlSession = MyBatisUtil.getSqlSessionFactory().openSession();
44
46
       BlogMapper blogMapper = sqlSession.getMapper(BlogMapper.class);
       blogMapper.updateBlog(blog);
       sqlSession.commit();
       }finally{
        sqlSession.close();
      }
      public void deleteBlog(Integer blogId) {
   SqlSession sqlSession = MyBatisUtil.getSqlSessionFactory().openSession();
       BlogMapper blogMapper = sqlSession.getMapper(BlogMapper.class);
```

```
blogMapper.deleteBlog(blogId);
sqlSession.commit();
}finally{
csqlSession.close();
}
63
64
65
}
66
67
}
```

Step#5: Create JUnit Test for BlogService methods

```
package com.sivalabs.mybatisdemo;
     import java.util.Date;
import java.util.List;
05
      import org.junit.AfterClass;
     import org.junit.Assert;
import org.junit.BeforeClass;
     import org.junit.Test;
      import com.sivalabs.mybatisdemo.domain.Blog;
     import com.sivalabs.mybatisdemo.service.BlogService;
14
      public class BlogServiceTest
16
       private static BlogService blogService;
     public static void setup()
{
        blogService = new BlogService();
23
24
25
      @AfterClass
          public static void teardown()
        blogService = null;
28
29
      }
30
31
       public void testGetBlogById()
32
       Blog blog = blogService.getBlogById(1);
        Assert.assertNotNull(blog);
System.out.println(blog);
36
      }
      @Test
38
           public void testGetAllBlogs()
40
        List<Blog> blogs = blogService.getAllBlogs();
        Assert.assertNotNull(blogs);
         for (Blog blog : blogs)
          System.out.println(blog);
46
47
       }
      }
            public void testInsertBlog()
            lBlog blog = new Blog();
blog.setBlogName('test_blog_'+System.currentTimeMillis());
blog.setCreatedOn(new Date());
        blogService.insertBlog(blog);
Assert.assertTrue(blog.getBlogId() != 0);
Blog createdBlog = blogService.getBlogById(blog.getBlogId());
Assert.assertNotNull(createdBlog);
        Assert.assertEquals(blog.getBlogName(), createdBlog.getBlogName());
63
64
           public void testUpdateBlog()
             long timestamp = System.currentTimeMillis();
        Blog blog = blogService.getBlogById(2);
blog.setBlogName('TestBlogName'+timestamp);
blogService.updateBlog(blog);
71
72
73
74
        Blog updatedBlog = blogService.getBlogById(2);
Assert.assertEquals(blog.getBlogName()), updatedBlog.getBlogName());
75
76
      @Test
          public void testDeleteBlog()
78
        Blog blog = blogService.getBlogById(4);
blogService.deleteBlog(blog.getBlogId());
Blog deletedBlog = blogService.getBlogById(4);
Assert.assertNull(deletedBlog);
79
80
81
```

Reference: MyBatis Tutorial: Part1 – CRUD Operations from our JCG partner, MyBatis Tutorial: Part-2: CRUD operations Using Annotations from our JCG partner Siva Reddy at the My Experiments on Technology blog.

You might also like:

- MyBatis Tutorial CRUD Operations and Mapping Relationships Part 2
- Spring MVC 3 Controller for MyBatis CRUD operation
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- 11 Responses to "MyBatis Tutorial CRUD Operations and Mapping Relationships
- Part 1"



Yannick Majoros

November 18th, 2012 at 3:05 pm

Come on, I hope nobody uses that instead of JPA?

Reply



Siva Prasad Reddy

November 19th, 2012 at 8:58 am

Try building a RESTFul services application which contain very complex object graph structure using JPA. If you try to marshall JPA loaded proxy after it got disconnected from Session it will throw LazyLoadingExcleption, if you try to marshall JPA entity by attaching it to JPA session it will load the entire database, if you are planning to use DTO pattern and populate the necessary properties only All the BEST:-) And then take a look at MyBatis:-)

Reply



Yannick Maioros

December 1st, 2012 at 10:41 pm

How w ould MyBatis solve that, besides the fact that it's non-standard and as such, the only implementation? If you need to load a complex object graph, you'll have to maintain it somehow. Perhaps your should not make your object graph that complex in the first place (seems it's w hat you do here anyw ay, small object graph for w hich jpa is a much better choice). Perhaps you should better find the bounds of your business operations, and know w hen to merge and w hen not to end your transaction or to detach. This thing is a relic, should disappear asap instead of letting people w rite crap that w ill eventually have to be refactored to jpa or be forever lost in spaghetti-code land.

Reply



Siva Prasad Reddy

February 4th, 2013 at 11:51 am

Hi,

I am not going to enter into never ending debate on whether STANDARDS are important

or not.

Here w hat I am trying to say is if I load a complex object structure using Mybatis they are really POJOs, not proxies. So I can use any of the marshalling/unmarshalling tools like Jackson/xstream etc to generate XML/JSON. If some property is null it will ignore to generate the tag or generates an empty tag.

Where as if I load a complex object by JPA w hich has lazy child collection then if I try to marshall that object it will throw LazyLoadingException if the object is detached from EntityManager. If that object is still attached to JPA entityManager it will load the w hole database as the marshalling libraries navigate through all the properties triggering loading the data from DB.

Anyw ay it would be great if you can show an example on how to marshall a JPA loaded object which has a lazy child collection property using Jackson without using manual copy-object (DTO) creation.

Reply



Phongveth

January 23rd, 2013 at 8:00 am

Hi Siva, I still confuse that can we define method in the interface which have return type boolean example like public void insertBlog(Blog blog); into public boolean insertBlog(Blog blog);

Reply



Siva Prasad Reddy

February 4th, 2013 at 11:31 am

No, for insert/update/delete queries you can return int representing the no of rows affected by the query. You can't return boolean.

Reply



Phongveth Luangs is ongkham

February 5th, 2013 at 3:03 am

Thank you very much for your reply

Reply



krish

February 7th, 2013 at 9:35 am

hello friend you have done very good w ork ... i used it in my app.... thx but i have a prob. w hen i open it from differ pc then it not show me onl9 to others ... and w hen i open it in my ow n pc w ith differ brow ser then it w orks good ... please help me

Reply



Jed

February 27th, 2014 at 12:47 pm

Hi Siva Reddy,

Thanks for your tutorial, I learned a lot.

I do have some points to address, I hope you dont mind sharing it.

On your Service objects(BlogService.java and UserService.java), i think these object are for actual DB execution. My concern is, how would you handle the Exceptions thrown by your JDBC driver? as far as I can see, try{} – finally{} are the only ones there. can you explain how to determine all the exceptions thrown by the driver? and is it possible to handle those? please provide a sample try{} – catch{} combination. Please reply thru my mail.

Thank you and Best Regards.

Reply



Siva

February 27th, 2014 at 2:41 pm

Hi Jed,

I haven't covered Exception handling in Service classes in the article. Yes, if you are using plain MyBatis you need to handle JDBC Exceptions using try-cach blocks. If you are using MyBatis w ith Spring then Spring w ill translate JDBC Exceptions into Spring's more appropriate DataAccessExceptions hierarchy and they are all RuntimeExceptions. If you w ant to handle case-by-case then you can catch those Exceptions and take necessary action.

Hope it helps.

Reply



deepak

June 27th, 2014 at 5:33 pm

Hi Siva

Thanks for this wonderful tutorial. I was trying a POC with ibatis 2 version and got stuck with some strange errors. Then wanted to switch over to ibatis. With your tutorial, i just completed it with half an hour. Thanks:) very useful

Reply

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