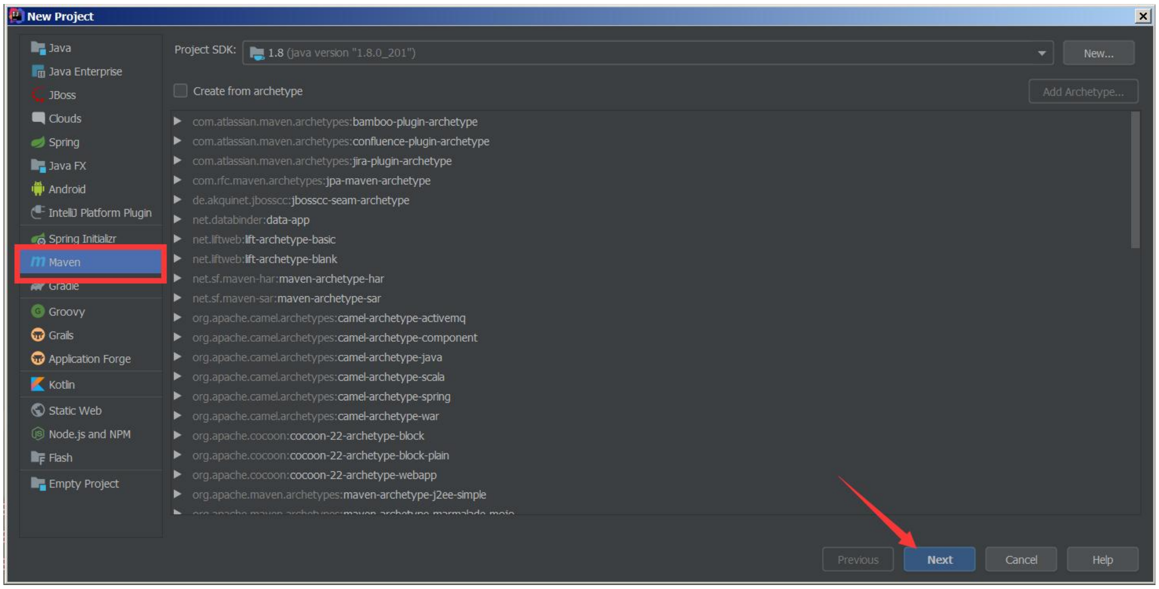
第八讲 SSM 框架集成

一、单一模块构建

- 新建项目


New Project
Java
Java Enterprise
JBoss
Clouds
Spring
Java FX
Android
IntelliJ Platform Plugin
Spring Initializr
Maven
Gradle
Groovy
Grails
Application Forge
Kotlin
Static Web
Node.js and NPM
Flash
Empty Project
New...
Add Archetype...
com.atlassian.maven.archetypes:bamboo-plugin-archetype
com.atlassian.maven.archetypes:confluence-plugin-archetype
com.atlassian.maven.archetypes:jira-plugin-archetype
com.rfc.maven.archetypes:jpa-maven-archetype
de.akquinet.jbosscc:jbosscc-seam-archetype
net.databinder:data-app
net.liftweb:lift-archetype-basic
net.liftweb:lift-archetype-blank
net.sf.maven-har:maven-archetype-har
net.sf.maven-sar:maven-archetype-sar
org.apache.camel.archetypes:camel-archetype-activemq
org.apache.camel.archetypes:camel-archetype-component
org.apache.camel.archetypes:camel-archetype-java
org.apache.camel.archetypes:camel-archetype-scala
org.apache.camel.archetypes:camel-archetype-spring
org.apache.camel.archetypes:camel-archetype-war
org.apache.cocoon:cocoon-22-archetype-block
org.apache.cocoon:cocoon-22-archetype-block-plain
org.apache.cocoon:cocoon-22-archetype-webapp
org.apache.maven.archetypes:maven-archetype-j2ee-simple
Previous
Next
Cancel
Help

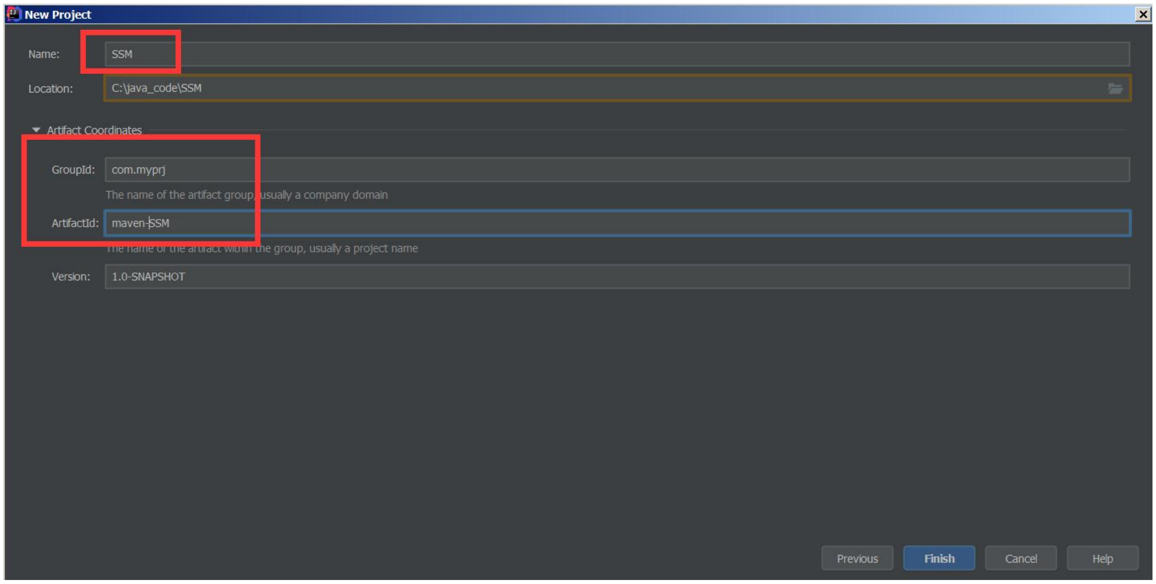
Project SDK: 1.8 (java version "1.8.0_201")

□ Create from archetype

Name：SSM

GroupId：com.myprj

ArtifactId:maven-SSM



Name: SSM

Location: C:\java_code\SSM

Artifact Coordinates

GroupId: com.myprj

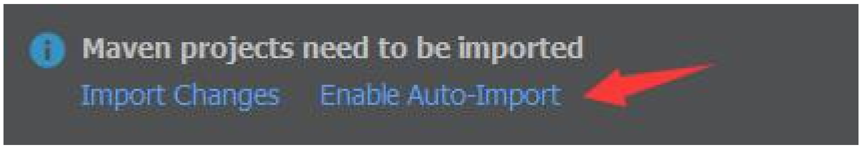
The name of the artifact group, usually a company domain

ArtifactId: maven-SSM

The name of the artifact within the group, usually a project name

Version: 1.0-SNAPSHOT

开启 Maven 工程自动导入功能



Maven projects need to be imported

- 编写 pom.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>com.myprj</groupId>
    <artifactId>maven-SSM</artifactId>
    <version>1.0-SNAPSHOT</version>
    <packaging>war</packaging>

    <properties>
        <junit.version>4.12</junit.version>
        <spring.version>5.2.7.RELEASE</spring.version>
        <mybatis.version>3.5.5</mybatis.version>
        <mybatis.spring.version>2.0.5</mybatis.spring.version>
        <!--
        <mysql.version>8.0.20</mysql.version>
        -->
        <mysql.version>5.1.32</mysql.version>
        <slf4j.version>1.6.4</slf4j.version>
        <jstl.version>1.2</jstl.version>
        <servlet-api.version>2.5</servlet-api.version>
        <jsp-api.version>2.0</jsp-api.version>
        <c3p0.version>0.9.5.2</c3p0.version>
    </properties>

    <dependencyManagement>
        <dependencies>
            <!-- 单元测试 -->
            <dependency>
                <groupId>junit</groupId>
                <artifactId>junit</artifactId>
                <version>${junit.version}</version>
                <scope>test</scope>
            </dependency>
            <!-- 日志处理 -->
            <dependency>
                <groupId>org.slf4j</groupId>
                <artifactId>slf4j-log4j12</artifactId>
                <version>${slf4j.version}</version>
            </dependency>
            <!-- Mybatis -->
            <dependency>
                <groupId>org.mybatis</groupId>
                <artifactId>mybatis</artifactId>
                <version>${mybatis.version}</version>
        </dependency>
        <dependency>
            <groupId>org.mybatis</groupId>
            <artifactId>mybatis-spring</artifactId>
            <version>${mybatis.spring.version}</version>
        </dependency>
        <!-- MySql -->
        <dependency>
            <groupId>mysql</groupId>
            <artifactId>mysql-connector-java</artifactId>
            <version>${mysql.version}</version>
        </dependency>
        <!-- 数据库连接池 -->
        <dependency>
            <groupId>com.mchange</groupId>
            <artifactId>c3p0</artifactId>
            <version>${c3p0.version}</version>
        </dependency>

        <!-- Spring -->
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-context</artifactId>
            <version>${spring.version}</version>
        </dependency>
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-beans</artifactId>
            <version>${spring.version}</version>
        </dependency>
        <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-aspects</artifactId>
            <version>${spring.version}</version>
        </dependency>
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-context-support</artifactId>
            <version>${spring.version}</version>
        </dependency>
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-test</artifactId>
            <version>${spring.version}</version>
        </dependency>
        <!-- JSP 相关  -->
        <dependency>
            <groupId>jstl</groupId>
            <artifactId>jstl</artifactId>
            <version>${jstl.version}</version>
        </dependency>
        <dependency>
            <groupId>javax.servlet</groupId>
            <artifactId>servlet-api</artifactId>
            <version>${servlet-api.version}</version>
            <scope>provided</scope>
            </dependency>
            <dependency>
                <groupId>javax.servlet</groupId>
                <artifactId>jsp-api</artifactId>
                <version>${jsp-api.version}</version>
                <scope>provided</scope>
            </dependency>
        </dependencies>
    </dependencyManagement>

    <dependencies>
        <!-- Spring -->
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-context</artifactId>
        </dependency>
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-beans</artifactId>
        </dependency>
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-webmvc</artifactId>
        </dependency>
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-jdbc</artifactId>
        </dependency>
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-aspects</artifactId>
        </dependency>
        <dependency>
```

```
            <groupId>org.springframework</groupId>
            <artifactId>spring-context-support</artifactId>
        </dependency>
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-test</artifactId>
        </dependency>
        <!-- JSP 相关 -->
        <dependency>
            <groupId>jstl</groupId>
            <artifactId>jstl</artifactId>
        </dependency>
        <dependency>
            <groupId>javax.servlet</groupId>
            <artifactId>servlet-api</artifactId>
            <scope>provided</scope>
        </dependency>
        <dependency>
            <groupId>javax.servlet</groupId>
            <artifactId>jsp-api</artifactId>
            <scope>provided</scope>
        </dependency>
        <dependency>
            <groupId>com.mchange</groupId>
            <artifactId>c3p0</artifactId>
        </dependency>
        <!-- 单元测试 -->
        <dependency>
            <groupId>junit</groupId>
            <artifactId>junit</artifactId>
            <version>${junit.version}</version>
            <scope>test</scope>
        </dependency>
        <!-- 日志处理 -->
        <dependency>
            <groupId>org.slf4j</groupId>
            <artifactId>slf4j-log4j12</artifactId>
        </dependency>
        <!-- Mybatis -->
        <dependency>
            <groupId>org.mybatis</groupId>
            <artifactId>mybatis</artifactId>
        </dependency>
        <dependency>
            <groupId>org.mybatis</groupId>
            <artifactId>mybatis-spring</artifactId>
        </dependency>
        <!-- MySql -->
        <dependency>
            <groupId>mysql</groupId>
            <artifactId>mysql-connector-java</artifactId>
        </dependency>
    </dependencies>

    <build>
        <plugins>
            <plugin>
                <groupId>org.apache.tomcat.maven</groupId>
                <artifactId>tomcat7-maven-plugin</artifactId>
                <configuration>
                    <path>/</path>
                    <port>8080</port>
                </configuration>
            </plugin>
        </plugins>
        <resources>
```

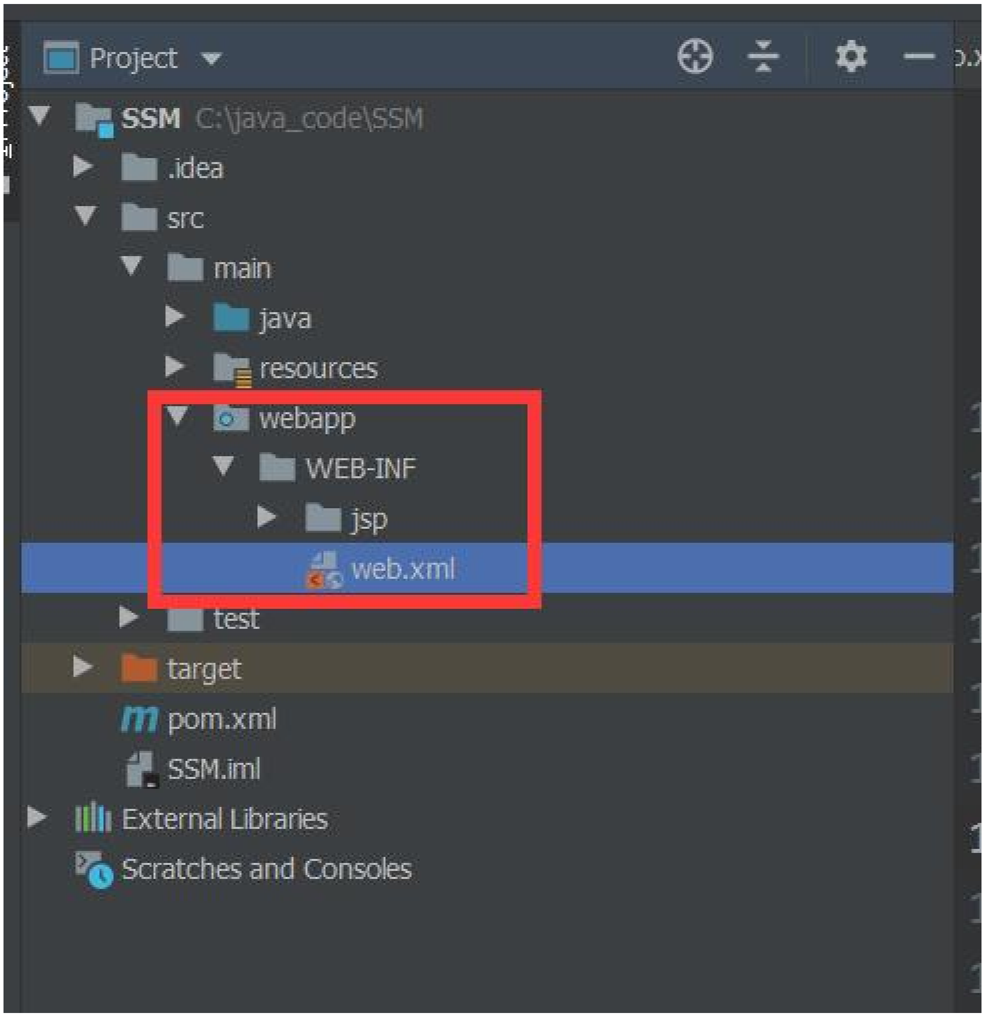
```
            <resource>
                <directory>src/main/java</directory>
                <includes>
                    <include>**/*.xml</include>
                </includes>
            </resource>
            <resource>
                <directory>src/main/resources</directory>
                <includes>
                    <include>**/*.xml</include>
                </includes>
            </resource>
        </resources>
    </build>

</project>
```

- 编写 web.xml

在 main 下创建 webapp 文件夹

在 webapp 下创建 WEB-INF

在 WEB-INF 下添加 web.xml



```
<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
         xmlns="http://java.sun.com/xml/ns/javaee"
         xsi:schemaLocation="http://java.sun.com/xml/ns/javaee
         http://java.sun.com/xml/ns/javaee/web-app_2_5.xsd"
         version="2.5">


    <display-name>maven-ssm</display-name>
    <welcome-file-list>
        <welcome-file>/</welcome-file>
    </welcome-file-list>
    <!-- post 乱码过滤器 -->
    <filter>
```

```
        <filter-name>CharacterEncodingFilter</filter-name>
        <filter-class>org.springframework.web.filter.CharacterEncodingFilter</filter-class>
        <init-param>
            <param-name>encoding</param-name>
            <param-value>utf-8</param-value>
        </init-param>
    </filter>
    <filter-mapping>
        <filter-name>CharacterEncodingFilter</filter-name>
        <url-pattern>/*</url-pattern>
    </filter-mapping>
    <!-- 前端控制器 -->
    <servlet>
        <servlet-name>ssmServlet</servlet-name>
        <servlet-class>org.springframework.web.servlet.DispatcherServlet</servlet-class>
        <!--
        contextConfigLocation 不是必须的， 如果不配置 contextConfigLocation，
        springmvc 的配置文件默认在：WEB-INF/servlet 的 name+"-servlet.xml"
        -->
        <init-param>
            <param-name>contextConfigLocation</param-name>
            <param-value>classpath:applicationContext.xml</param-value>
        </init-param>
        <load-on-startup>1</load-on-startup>
    </servlet>
    <servlet-mapping>
        <servlet-name>ssmServlet</servlet-name>
        <url-pattern>/</url-pattern>
    </servlet-mapping>

</web-app>
```

- 实体 com.myprj.entity.News

```
package com.myprj.entity;

import java.util.Date;

public class News {
    private Integer id;
    private String title;
    private String content;
    private Date createTime;

    public Integer getId() {
        return id;
    }

    public void setId(Integer id) {
        this.id = id;
    }

    public String getTitle() {
        return title;
    }

    public void setTitle(String title) {
        this.title = title;
    }

    public String getContent() {
        return content;
    }

    public void setContent(String content) {
        this.content = content;
    }

    public Date getCreateTime() {
        return createTime;
    }

    public void setCreateTime(Date createTime) {
        this.createTime = createTime;
    }
}
```

- DAO 接口 com.myprj.dao.NewsDao

```
package com.myprj.dao;

import com.myprj.entity.News;

import java.util.List;

public interface NewsDao {
    public List<News> getAll();
}
```

- 添加 com/myprj/dao/mapper/NewsMapper.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">
<!--namepace:dao 接口路径-->
<mapper namespace="com.myprj.dao.NewsDao">
    <select id="getAll" resultType="News">
        select * from news
    </select>
</mapper>
```

- 添加 service 接口及其实现类

com.myprj.service.NewsService

```
package com.myprj.service;

import com.myprj.entity.News;

import java.util.List;

public interface NewsService {
    public List<News> getAll();
}
```

com.myprj.service.impl.NewsServiceImpl

```
package com.myprj.service.impl;

import com.myprj.dao.NewsDao;
import com.myprj.entity.News;
import com.myprj.service.NewsService;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.stereotype.Service;

import java.util.List;

@Service
public class NewsServiceImpl implements NewsService {
    @Autowired
    private NewsDao newsDao;

    public List<News> getAll() {
        return newsDao.getAll();
    }
}
```

- 添加 Controller

com.myprj.controller.NewsController

```
package com.myprj.controller;

import com.myprj.entity.News;
import com.myprj.service.NewsService;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.stereotype.Controller;
import org.springframework.ui.Model;
import org.springframework.web.bind.annotation.RequestMapping;
import org.springframework.web.servlet.ModelAndView;

import java.util.List;

@Controller
public class NewsController {
    @Autowired
    private NewsService newsService;

    @RequestMapping("/")
    public String index(Model model){
        List<News> newsList = newsService.getAll();
        System.out.println(newsList.size());
        model.addAttribute("newsList",newsList);
        return "index";
    }
}
```

- 添加 jsp

在 WEB-INF 下创建 jsp 文件夹

在 jsp 文件夹下新建 index.jsp

```
<%--
  Created by IntelliJ IDEA.
  User: Administrator
  Date: 2020/7/5 0005
  Time: 15:08
  To change this template use File | Settings | File Templates.
--%>
<%@ page contentType="text/html;charset=UTF-8" language="java" %>
<%@taglib prefix="c" uri="http://java.sun.com/jsp/jstl/core" %>
<%@taglib prefix="fmt" uri="http://java.sun.com/jsp/jstl/fmt" %>
<html>
<head>
    <title>Title</title>
</head>
<body>
<h1>
    新闻列表:
</h1>
<ul>
<c:forEach items="${requestScope.newsList}" var="news">
    <li>${news.title}----<fmt:formatDate value="${news.createTime}"
pattern="yyyy-MM-dd"/></li>
</c:forEach>
</ul>
</body>
</html>
```

- 在 resources 中添加配置

applicationContext-dao.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-4.3.xsd
         http://www.springframework.org/schema/context
         http://www.springframework.org/schema/context/spring-context-4.3.xsd">

    <context:component-scan base-package="com.myprj.dao" />

    <!-- 数据库连接池 -->
    <bean id="dataSource" class="com.mchange.v2.c3p0.ComboPooledDataSource">
        <!--
        <property name="driverClass" value="com.mysql.cj.jdbc.Driver"></property>
        <property name="jdbcUrl"
value="jdbc:mysql://localhost:3306/shoppingstreet?useSSL=false&amp;serverTimezone=UT
C"></property>
        -->
        <property name="driverClass" value="com.mysql.jdbc.Driver"></property>
        <property name="jdbcUrl"
value="jdbc:mysql://localhost:3306/shoppingstreet"></property>

        <property name="user" value="root"></property>
        <property name="password" value="root"></property>
        <!--连接池启动的时候默认创建的连接数量 -->
        <property name="initialPoolSize" value="3"></property>
        <!--连接池最多可以管理的连接对象个数 -->
        <property name="maxPoolSize" value="100"></property>
        <!--连接池中最多能够管理的 statement 对象 -->
        <property name="maxStatements" value="1000"></property>
        <!--一旦连接池中现有的连接数量不够，每次增长的连接数目：5 ，但是连接池中的连
```

```
接数量 -->
        <!--最多不可超过 maxPoolSize 中设置的连接数目 -->
        <property name="acquireIncrement" value="5"></property>
    </bean>
    <!-- SqlSessionFactory -->
    <!-- 让 spring 管理 sqlsessionfactory 使用 mybatis 和 spring 整合包中的 -->
    <bean id="sqlSessionFactory" class="org.mybatis.spring.SqlSessionFactoryBean">
        <!-- 数据库连接池 -->
        <property name="dataSource" ref="dataSource" />
        <property name="typeAliasesPackage" value="com.myprj.entity" />
        <!-- 加载 mybatis 的全局配置文件 -->
        <property name="mapperLocations" value="classpath*:com/myprj/dao/**/*.xml" />
    </bean>

    <bean class="org.mybatis.spring.mapper.MapperScannerConfigurer">
        <!--指定 dao 接口的位置 -->
        <property name="basePackage" value="com.myprj.dao" />
        <property                                name="sqlSessionFactoryBeanName"
value="sqlSessionFactory"></property>
    </bean>

</beans>
```

applicationContext-trans.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<beans xmlns="http://www.springframework.org/schema/beans"
       xmlns:aop="http://www.springframework.org/schema/aop"
       xmlns:tx="http://www.springframework.org/schema/tx"
       xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
       xsi:schemaLocation="http://www.springframework.org/schema/beans
        http://www.springframework.org/schema/beans/spring-beans-4.3.xsd
    http://www.springframework.org/schema/aop
```

```
     http://www.springframework.org/schema/aop/spring-aop-4.3.xsd
      http://www.springframework.org/schema/tx
       http://www.springframework.org/schema/tx/spring-tx-4.3.xsd
    ">

    <!-- 事务管理器 -->
    <bean id="transactionManager"
          class="org.springframework.jdbc.datasource.DataSourceTransactionManager">
        <!-- 数据源 -->
        <property name="dataSource" ref="dataSource" />
    </bean>
    <!-- 通知 -->
    <tx:advice id="txAdvice" transaction-manager="transactionManager">
        <tx:attributes>
            <!-- 传播行为 -->
            <tx:method name="save*" propagation="REQUIRED" />
            <tx:method name="insert*" propagation="REQUIRED" />
            <tx:method name="add*" propagation="REQUIRED" />
            <tx:method name="create*" propagation="REQUIRED" />
            <tx:method name="delete*" propagation="REQUIRED" />
            <tx:method name="update*" propagation="REQUIRED" />
            <tx:method name="find*" propagation="SUPPORTS" read-only="true" />
            <tx:method name="select*" propagation="SUPPORTS" read-only="true" />
            <tx:method name="get*" propagation="SUPPORTS" read-only="true" />
        </tx:attributes>
    </tx:advice>
    <!-- 切面 -->
    <aop:config>
        <aop:advisor advice-ref="txAdvice"
                    pointcut="execution(* com.myprj.service.*.*(..))" />
    </aop:config>

</beans>
```

applicationContext-service.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<beans xmlns="http://www.springframework.org/schema/beans"
        xmlns:context="http://www.springframework.org/schema/context"
        xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
        xsi:schemaLocation="http://www.springframework.org/schema/beans
          http://www.springframework.org/schema/beans/spring-beans-4.3.xsd
    http://www.springframework.org/schema/context
    http://www.springframework.org/schema/context/spring-context-4.3.xsd
    ">

    <context:component-scan base-package="com.myprj.service"/>
</beans>
```

applicationContext-mvc.xml

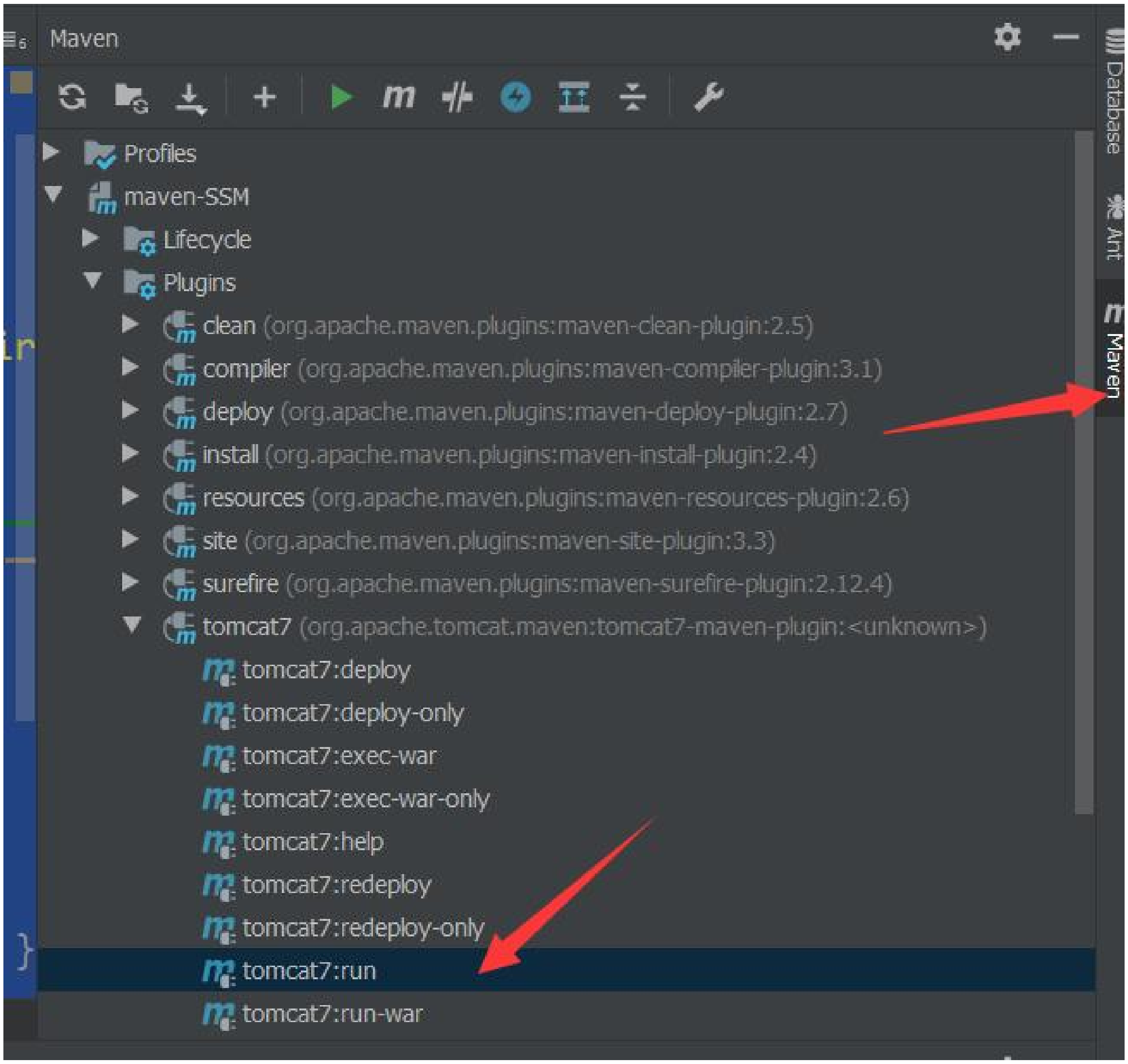
```
<?xml version="1.0" encoding="UTF-8"?>
<beans xmlns="http://www.springframework.org/schema/beans"
        xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:p="http://www.springframework.org/schema/p"
        xmlns:context="http://www.springframework.org/schema/context"
        xmlns:mvc="http://www.springframework.org/schema/mvc"
        xsi:schemaLocation="http://www.springframework.org/schema/beans
          http://www.springframework.org/schema/beans/spring-beans-4.3.xsd
          http://www.springframework.org/schema/mvc
            http://www.springframework.org/schema/mvc/spring-mvc-4.3.xsd
          http://www.springframework.org/schema/context
          http://www.springframework.org/schema/context/spring-context-4.3.xsd">

    <!-- 配置注解驱动 -->
    <mvc:annotation-driven />
    <!-- 视图解析器 -->
    <bean
            class="org.springframework.web.servlet.view.InternalResourceViewResolver">
        <property name="prefix" value="/WEB-INF/jsp/" />
        <property name="suffix" value=".jsp" />
    </bean>
    <!-- 配置包扫描器，扫描@Controller 注解的类 -->
    <context:component-scan base-package="com.myprj.controller"/>
    <!-- 配置资源映射 -->
    <mvc:resources location="/css/" mapping="/css/**"/>
    <mvc:resources location="/js/" mapping="/js/**"/>

</beans>
```

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"
       xsi:schemaLocation="http://www.springframework.org/schema/beans
        http://www.springframework.org/schema/beans/spring-beans-4.3.xsd">

    <import resource="applicationContext-dao.xml"/>
    <import resource="applicationContext-mvc.xml"/>
    <import resource="applicationContext-service.xml"/>
    <import resource="applicationContext-trans.xml"/>

</beans>
```

- 测试运行：

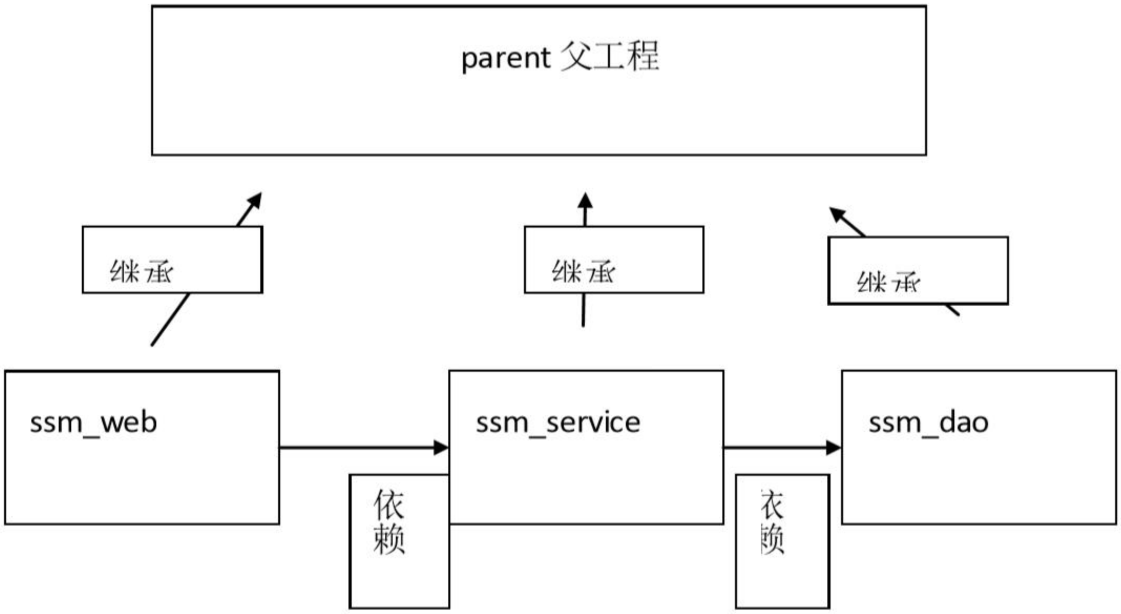
双击 tomcat7:run



- Profiles
- maven-SSM
  - Lifecycle
  - Plugins
    - clean (org.apache.maven.plugins:maven-clean-plugin:2.5)
    - compiler (org.apache.maven.plugins:maven-compiler-plugin:3.1)
    - deploy (org.apache.maven.plugins:maven-deploy-plugin:2.7)
    - install (org.apache.maven.plugins:maven-install-plugin:2.4)
    - resources (org.apache.maven.plugins:maven-resources-plugin:2.6)
    - site (org.apache.maven.plugins:maven-site-plugin:3.3)
    - surefire (org.apache.maven.plugins:maven-surefire-plugin:2.12.4)
    - tomcat7 (org.apache.tomcat.maven:tomcat7-maven-plugin:<unknown>)
      - tomcat7:deploy
      - tomcat7:deploy-only
      - tomcat7:exec-war
      - tomcat7:exec-war-only
      - tomcat7:help
      - tomcat7:redeploy
      - tomcat7:redeploy-only
      - tomcat7:run
      - tomcat7:run-war

二、分模块构建

1. 理解继承和聚合



何为继承?

继承是为了消除重复，如果将 dao、service、web 分开创建独立的工程则每个工程的 pom.xml 文件中的内容存在重复，比如：设置编译版本、锁定 spring 的版本的等，可以将这些重复的配置提取出来在父工程的 pom.xml 中定义。

何为聚合?

项目开发通常是分组分模块开发，每个模块开发完成要运行整个工程需要将每个模块聚合在一起运行，比如：dao、service、web 三个工程最终会打一个独立的 war 运行。

2. 案例实现

① maven-parent 父模块

- 创建父工程

name:ssm2

groupId:com.myprj

artifactId:maven-SSM2

- 定义 pom.xml

在父工程的 pom.xml 中抽取一些重复的配置的，比如：锁定 jar 包的版本、设置编译版本等。打包方式设置为 pom

```
<?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>com.myprj</groupId>
    <artifactId>maven-SSM2</artifactId>
    <version>1.0-SNAPSHOT</version>
    <modules>
        <module>ssm-dao</module>
        <module>ssm-service</module>
        <module>ssm-web</module>
    </modules>
    <packaging>pom</packaging>

    <properties>
        <junit.version>4.12</junit.version>
        <spring.version>5.2.7.RELEASE</spring.version>
        <mybatis.version>3.5.5</mybatis.version>
```

```xml
        <mybatis.spring.version>2.0.5</mybatis.spring.version>
        <!--
        <mysql.version>8.0.20</mysql.version>
        -->
        <mysql.version>5.1.32</mysql.version>
        <slf4j.version>1.6.4</slf4j.version>
        <jstl.version>1.2</jstl.version>
        <servlet-api.version>2.5</servlet-api.version>
        <jsp-api.version>2.0</jsp-api.version>
        <c3p0.version>0.9.5.2</c3p0.version>
    </properties>

    <dependencyManagement>
        <dependencies>
            <!-- 单元测试 -->
            <dependency>
                <groupId>junit</groupId>
                <artifactId>junit</artifactId>
                <version>${junit.version}</version>
                <scope>test</scope>
            </dependency>
            <!-- 日志处理 -->
            <dependency>
                <groupId>org.slf4j</groupId>
                <artifactId>slf4j-log4j12</artifactId>
                <version>${slf4j.version}</version>
            </dependency>
            <!-- Mybatis -->
            <dependency>
                <groupId>org.mybatis</groupId>
                <artifactId>mybatis</artifactId>
                <version>${mybatis.version}</version>
            </dependency>
        <dependency>
            <groupId>org.mybatis</groupId>
            <artifactId>mybatis-spring</artifactId>
            <version>${mybatis.spring.version}</version>
        </dependency>
        <!-- MySql -->
        <dependency>
            <groupId>mysql</groupId>
            <artifactId>mysql-connector-java</artifactId>
            <version>${mysql.version}</version>
        </dependency>
        <!-- 数据库连接池 -->
        <dependency>
            <groupId>com.mchange</groupId>
            <artifactId>c3p0</artifactId>
            <version>${c3p0.version}</version>
        </dependency>

        <!-- Spring -->
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-context</artifactId>
            <version>${spring.version}</version>
        </dependency>
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-beans</artifactId>
            <version>${spring.version}</version>
        </dependency>
        <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-aspects</artifactId>
            <version>${spring.version}</version>
        </dependency>
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-context-support</artifactId>
            <version>${spring.version}</version>
        </dependency>
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-test</artifactId>
            <version>${spring.version}</version>
        </dependency>
        <!-- JSP 相关 -->
        <dependency>
            <groupId>jstl</groupId>
            <artifactId>jstl</artifactId>
            <version>${jstl.version}</version>
        </dependency>
        <dependency>
            <groupId>javax.servlet</groupId>
            <artifactId>servlet-api</artifactId>
            <version>${servlet-api.version}</version>
            <scope>provided</scope>
        </dependency>
```

```
            <dependency>
                <groupId>javax.servlet</groupId>
                <artifactId>jsp-api</artifactId>
                <version>${jsp-api.version}</version>
                <scope>provided</scope>
            </dependency>
        </dependencies>
    </dependencyManagement>

    <dependencies>
        <!-- Spring -->
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-context</artifactId>
        </dependency>
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-beans</artifactId>
        </dependency>
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-webmvc</artifactId>
        </dependency>
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-jdbc</artifactId>
        </dependency>
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-aspects</artifactId>
        </dependency>
        <dependency>
            <groupId>org.springframework</groupId>
        <artifactId>spring-context-support</artifactId>
    </dependency>
    <dependency>
        <groupId>org.springframework</groupId>
        <artifactId>spring-test</artifactId>
    </dependency>
    <!-- JSP 相关 -->
    <dependency>
        <groupId>jstl</groupId>
        <artifactId>jstl</artifactId>
    </dependency>
    <dependency>
        <groupId>javax.servlet</groupId>
        <artifactId>servlet-api</artifactId>
        <scope>provided</scope>
    </dependency>
    <dependency>
        <groupId>javax.servlet</groupId>
        <artifactId>jsp-api</artifactId>
        <scope>provided</scope>
    </dependency>
    <dependency>
        <groupId>com.mchange</groupId>
        <artifactId>c3p0</artifactId>
    </dependency>
    <!-- 单元测试 -->
    <dependency>
        <groupId>junit</groupId>
        <artifactId>junit</artifactId>
        <version>${junit.version}</version>
        <scope>test</scope>
    </dependency>
    <!-- 日志处理 -->
```

```
        <dependency>
            <groupId>org.slf4j</groupId>
            <artifactId>slf4j-log4j12</artifactId>
        </dependency>
        <!-- Mybatis -->
        <dependency>
            <groupId>org.mybatis</groupId>
            <artifactId>mybatis</artifactId>
        </dependency>
        <dependency>
            <groupId>org.mybatis</groupId>
            <artifactId>mybatis-spring</artifactId>
        </dependency>
        <!-- MySql -->
        <dependency>
            <groupId>mysql</groupId>
            <artifactId>mysql-connector-java</artifactId>
        </dependency>
    </dependencies>

    <build>
        <plugins>
            <plugin>
                <groupId>org.apache.tomcat.maven</groupId>
                <artifactId>tomcat7-maven-plugin</artifactId>
                <configuration>
                    <path>/</path>
                    <port>8080</port>
                </configuration>
            </plugin>
        </plugins>
    </build>
```

```
</project>
```

② ssm_dao 子模块

- 创建 dao 子模块

在父工程上右击创建 maven 模块：

填写模块名称 ssm_dao

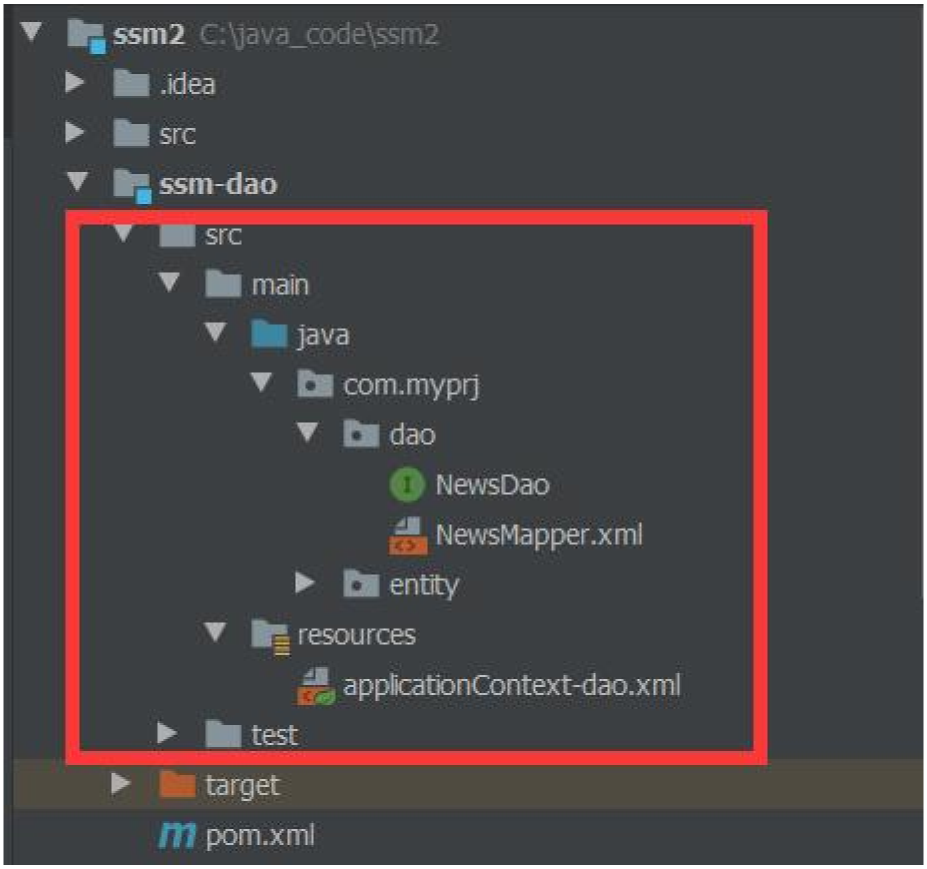
打包方式是 jar

- 定义 pom.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>maven-SSM2</artifactId>
        <groupId>com.myprj</groupId>
        <version>1.0-SNAPSHOT</version>
    </parent>
    <modelVersion>4.0.0</modelVersion>

    <artifactId>ssm-dao</artifactId>

    <build>
        <resources>
            <resource>
                <directory>src/main/java</directory>
                <includes>
                    <include>**/*.xml</include>
                </includes>
            </resource>
            <resource>
```

```
                <directory>src/main/resources</directory>
                <includes>
                    <include>**/*.xml</include>
                </includes>
            </resource>
        </resources>
    </build>
</project>
```

- 代码与配置



```
▼ ssm2  C:\java_code\ssm2
    ▶ .idea
    ▶ src
    ▼ ssm-dao
        ▼ src
            ▼ main
                ▼ java
                    ▼ com.myprj
                        ▼ dao
                              NewsDao
                              NewsMapper.xml
                        ▶ entity
                ▼ resources
                      applicationContext-dao.xml
            ▶ test
        ▶ target
          pom.xml
```

③ ssm_service 子模块

- 创建 service 子模块

方法同 ssm_dao 模块创建方法，模块名称为 ssm_service。

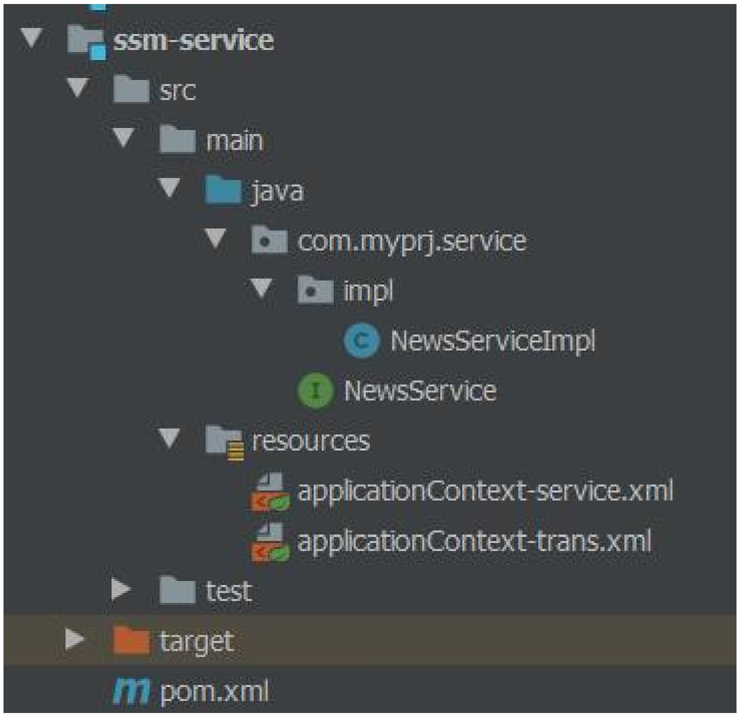
- 定义 pom.xml

ssm_service 模块的 pom.xml 文件中需要继承父模块，ssm_service 依赖 ssm_dao 模块，添加

spring 相关的依赖：

```
<?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">
    <parent>
        <artifactId>maven-SSM2</artifactId>
        <groupId>com.myprj</groupId>
        <version>1.0-SNAPSHOT</version>
    </parent>
    <modelVersion>4.0.0</modelVersion>

    <artifactId>ssm-service</artifactId>

    <dependencies>
        <dependency>
            <artifactId>ssm-dao</artifactId>
            <groupId>com.myprj</groupId>
            <version>1.0-SNAPSHOT</version>
        </dependency>
    </dependencies>
</project>
```

- 代码及配置



```
▼ ssm-service
    ▼ src
        ▼ main
            ▼ java
                ▼ com.myprj.service
                    ▼ impl
                        NewsServiceImpl
                      NewsService
            ▼ resources
                applicationContext-service.xml
                applicationContext-trans.xml
        ▶ test
    ▶ target
      pom.xml
```

④ ssm_web 子模块

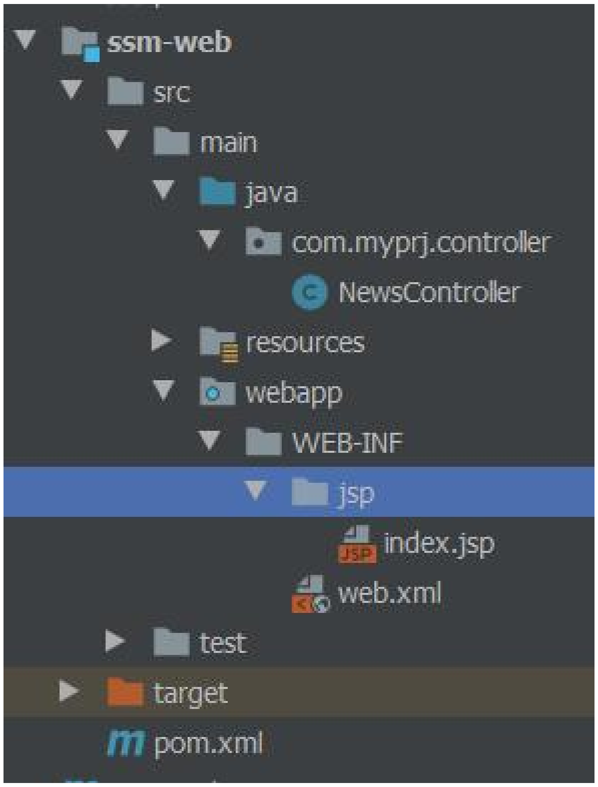
- 创建 web 子模块

添加打包方式 war

- 定义 pom.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>maven-SSM2</artifactId>
        <groupId>com.myprj</groupId>
        <version>1.0-SNAPSHOT</version>
    </parent>
    <modelVersion>4.0.0</modelVersion>

    <artifactId>ssm-web</artifactId>
    <packaging>war</packaging>

    <dependencies>
        <dependency>
            <artifactId>ssm-service</artifactId>
            <groupId>com.myprj</groupId>
            <version>1.0-SNAPSHOT</version>
        </dependency>
    </dependencies>
</project>
```

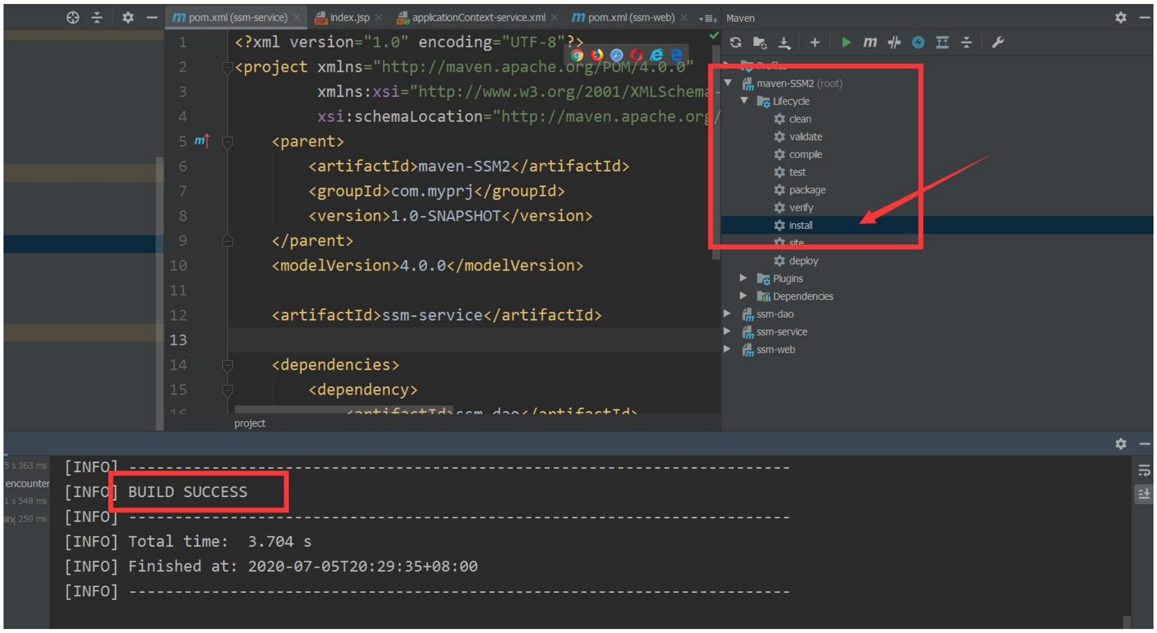
- 代码与配置文件



```
ssm-web
    src
        main
            java
                com.myprj.controller
                    NewsController
            resources
            webapp
                WEB-INF
                    jsp
                        index.jsp
                    web.xml
        test
    target
    pom.xml
```

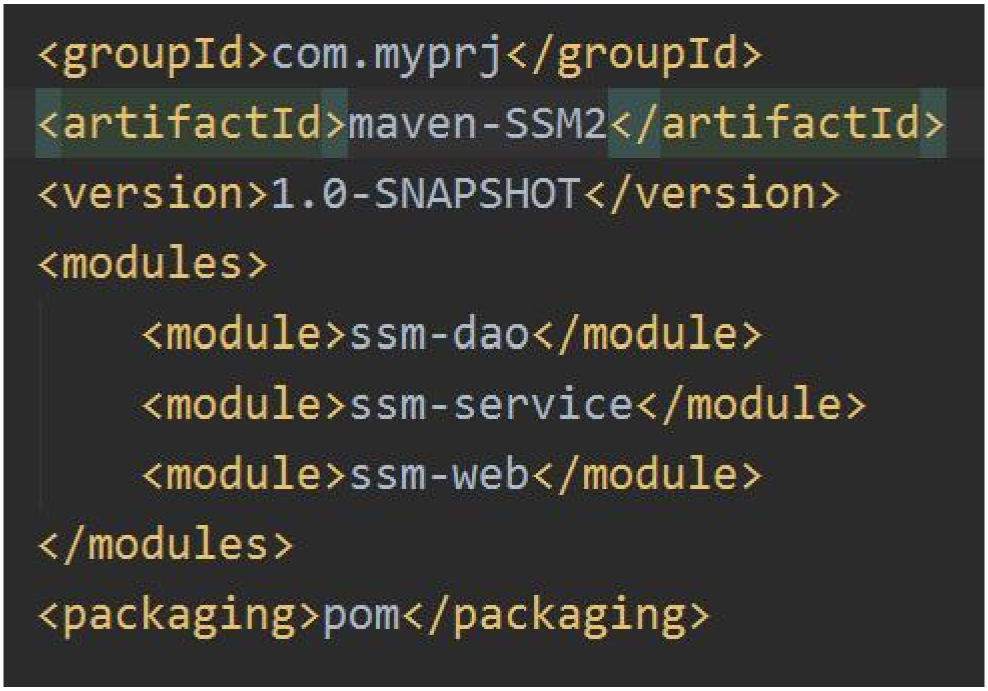
⑤ 将父工程发布至仓库

父工程执行 install 将父工程发布到仓库方便子工程继承：

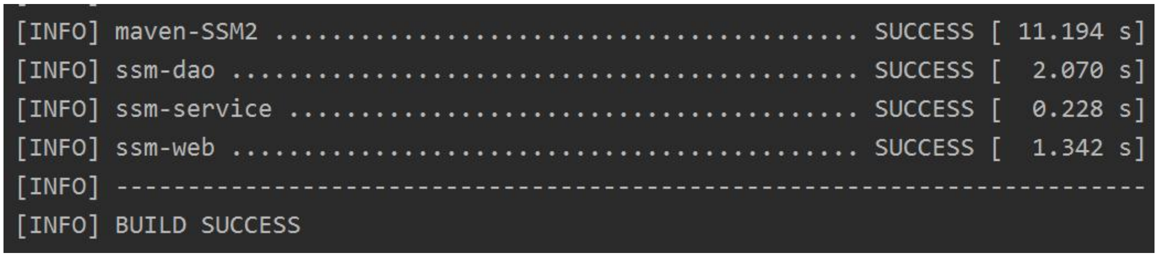


```xml
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0"
         xmlns:xsi="http://www.w3.org/2001/XMLSchema-
         xsi:schemaLocation="http://maven.apache.org/
    <parent>
        <artifactId>maven-SSM2</artifactId>
        <groupId>com.myprj</groupId>
        <version>1.0-SNAPSHOT</version>
    </parent>
    <modelVersion>4.0.0</modelVersion>

    <artifactId>ssm-service</artifactId>

    <dependencies>
        <dependency>
            <artifactId>ssm-dao</artifactId>
```

```
[INFO] ------------------------------------------------------------------------
[INFO] BUILD SUCCESS
[INFO] ------------------------------------------------------------------------
[INFO] Total time:  3.704 s
[INFO] Finished at: 2020-07-05T20:29:35+08:00
[INFO] ------------------------------------------------------------------------
```



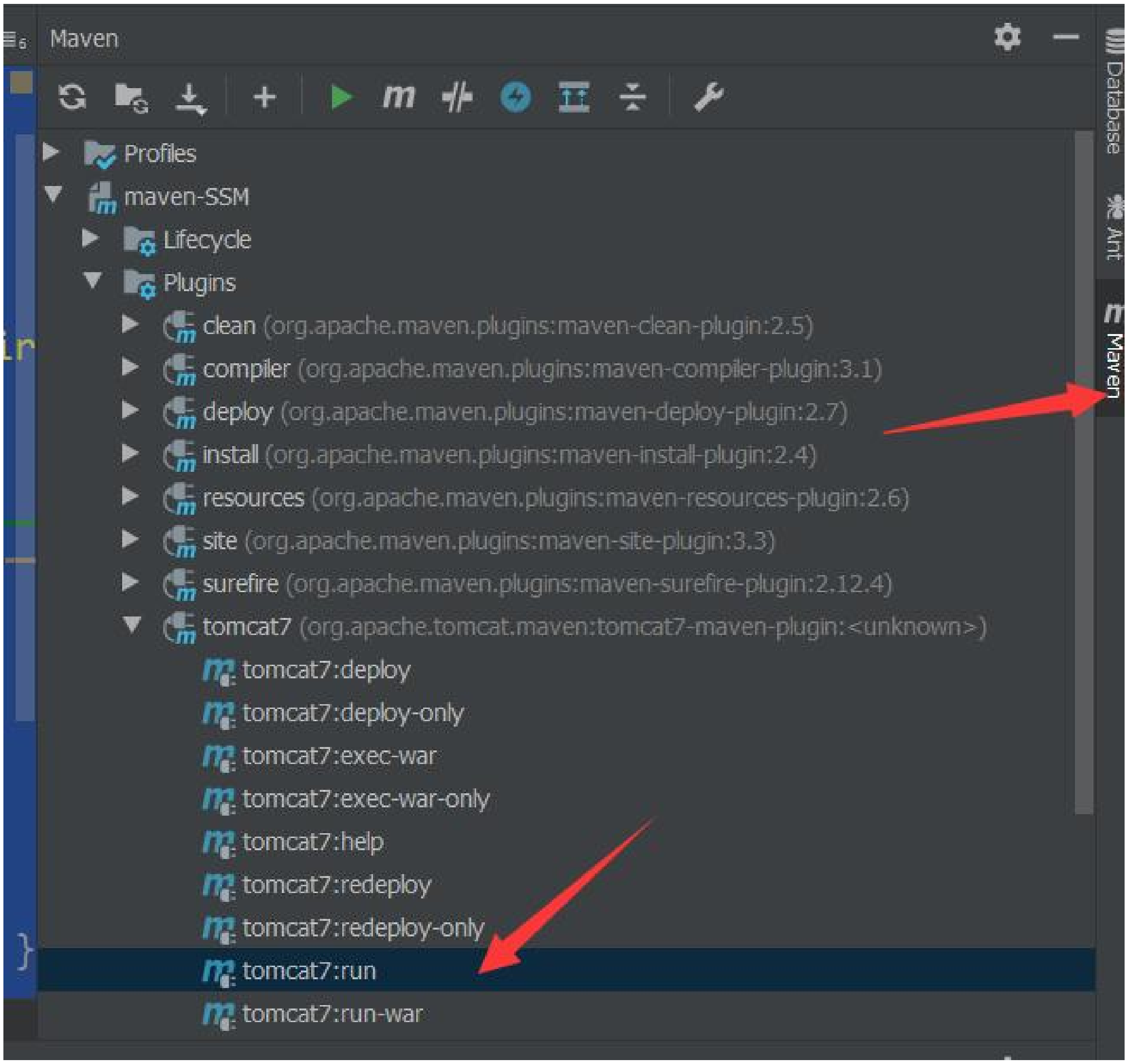
```xml
<groupId>com.myprj</groupId>
<artifactId>maven-SSM2</artifactId>
<version>1.0-SNAPSHOT</version>
<modules>
    <module>ssm-dao</module>
    <module>ssm-service</module>
    <module>ssm-web</module>
</modules>
<packaging>pom</packaging>
```



```
[INFO] maven-SSM2 ........................................ SUCCESS [ 11.194 s]
[INFO] ssm-dao ........................................... SUCCESS [  2.070 s]
[INFO] ssm-service ....................................... SUCCESS [  0.228 s]
[INFO] ssm-web ........................................... SUCCESS [  1.342 s]
[INFO] ------------------------------------------------------------------------
[INFO] BUILD SUCCESS
```

⑥ 测试运行

双击 tomcat7:run


Maven
Database
Ant
Maven
Profiles
maven-SSM
Lifecycle
Plugins
clean (org.apache.maven.plugins:maven-clean-plugin:2.5)
compiler (org.apache.maven.plugins:maven-compiler-plugin:3.1)
deploy (org.apache.maven.plugins:maven-deploy-plugin:2.7)
install (org.apache.maven.plugins:maven-install-plugin:2.4)
resources (org.apache.maven.plugins:maven-resources-plugin:2.6)
site (org.apache.maven.plugins:maven-site-plugin:3.3)
surefire (org.apache.maven.plugins:maven-surefire-plugin:2.12.4)
tomcat7 (org.apache.tomcat.maven:tomcat7-maven-plugin:<unknown>)
tomcat7:deploy
tomcat7:deploy-only
tomcat7:exec-war
tomcat7:exec-war-only
tomcat7:help
tomcat7:redeploy
tomcat7:redeploy-only
tomcat7:run
tomcat7:run-war