尚硅谷大数据项目之手机 APP 信息统计分析系统

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官网：www.atguigu.com

版本：V1.0

一 项目概述

1.1 角色

1）App 开发商

每个开发商可以有多个 App 产品

2）App 软件

3）数据服务平台提供商

友盟，向 App 开发商提供服务。提供 App 使用情况的统计服务。

友盟官方网址：https://www.umeng.com/

4）SDK

数据服务平台提供商提供给 App 开发商的软件包。

内置 log 上报程序。

5）用户

每个使用 App 的设备。

6）租户

购买了数据服务平台提供商服务的 App 开发商。

1.2 业务术语

1）用户

用户以设备为判断标准，在移动统计中，每个独立设备认为是一个独立用户。Android 系统根据 IMEI 号，IOS 系统根据 OpenUDID 来标识一个独立用户，每部手机一个用户。

2）新增用户

首次联网使用应用的用户。如果一个用户首次打开某 app，那这个用户定义为新增用户；

卸载再安装的设备，不会被算作一次新增。日新增用户、周新增用户、月新增用户。

3）活跃用户

打开应用的用户即为活跃用户，不考虑用户的使用情况。每天一台设备打开多次会被计为一个活跃用户。

4）周（月）活跃用户

某个自然周（月）内启动过应用的用户，该周（月）内的多次启动只记一个活跃用户。

5）月活跃率

月活跃用户与截止到该月累计的用户总和之间的比例。

6）沉默用户

用户仅在安装当天（次日）启动一次，后续时间无再启动行为。该指标可以反映新增用户质量和用户与 APP 的匹配程度。

7）版本分布

不同版本的周内各天新增用户数，活跃用户数和启动次数。利于判断 App 各个版本之间的优劣和用户行为习惯。

8）本周回流用户

上周未启动过应用，本周启动了应用的用户。

9）连续 n 周活跃用户

连续 n 周，每周至少启动一次。

10）忠诚用户

连续活跃 5 周以上的用户

11）连续活跃用户

连续 2 周及以上活跃的用户

12）近期流失用户

连续 n(2<= n <= 4)周没有启动应用的用户。（第 n+1 周没有启动过）

13）留存用户

某段时间内的新增用户，经过一段时间后，仍然使用应用的被认作是留存用户；这部分用户占当时新增用户的比例即是留存率。例如，5 月份新增用户 200，这 200 人在 6 月份启动过应用的有 100 人，7 月份启动过应用的有 80 人，8 月份启动过应用的有 50 人；则 5 月份新增用户一个月后的留存率是 50%，二个月后的留存率是 40%，三个月后的留存率是 25%.

14）用户新鲜度

每天启动应用的新老用户比例。

15）单次使用时长

每次启动使用的时间长度。

16）日使用时长

累计一天内的使用时间长度。

17）启动次数计算标准

IOS 平台应用退到后台就算一次独立的启动；Android 平台我们规定，两次启动之间的间隔小于 30 秒，被计算一次启动。用户在使用过程中，若因收发短信或接电话等退出应用 30 秒又再次返回应用中，那这两次行为应该是延续而非独立的，所以可以被算作一次使用行为，即一次启动。业内大多使用 30 秒这个标准，但用户还是可以自定义此时间间隔。

1.3 项目效果展示

略

二 项目需求

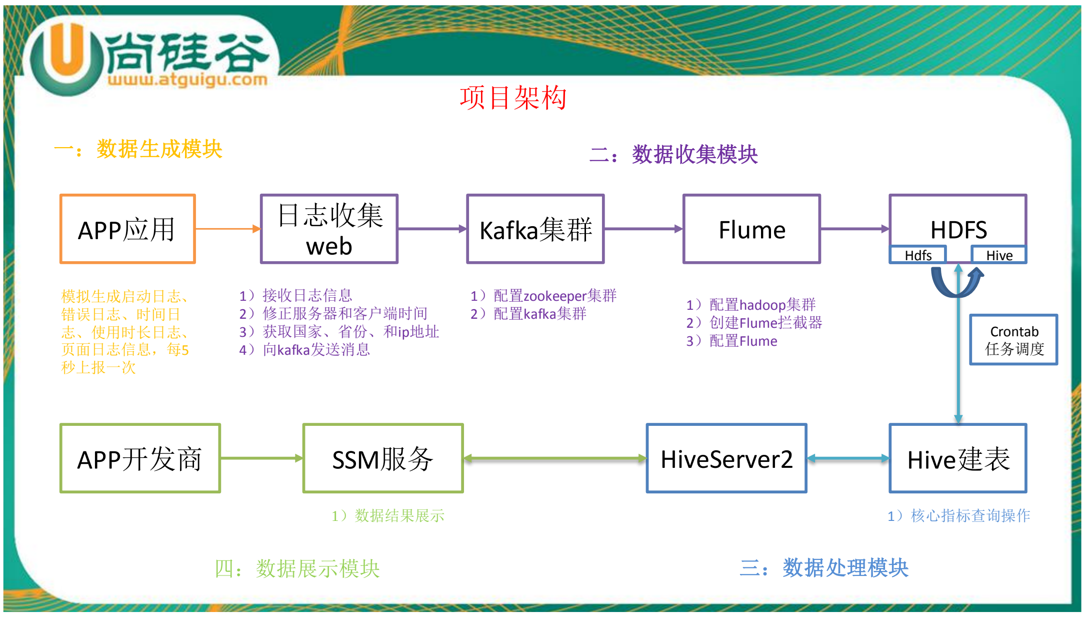
1）实现收集手机 APP 日志。

2）定期离线分析手机 APP 新增用户、活跃用户、沉默用户、启动次数、版本分布、和留存用户等业务指标。

3）在数据展示服务上可以查询结果。

三 项目概要

3.1 项目技术架构



1）手机 APP 启动时，上报启动日志、错误日志、页面日志、事件日志、使用时长日志等信息到日志收集服务器。

2）日志收集服务器将收集到的日志信息发送给 kafka。

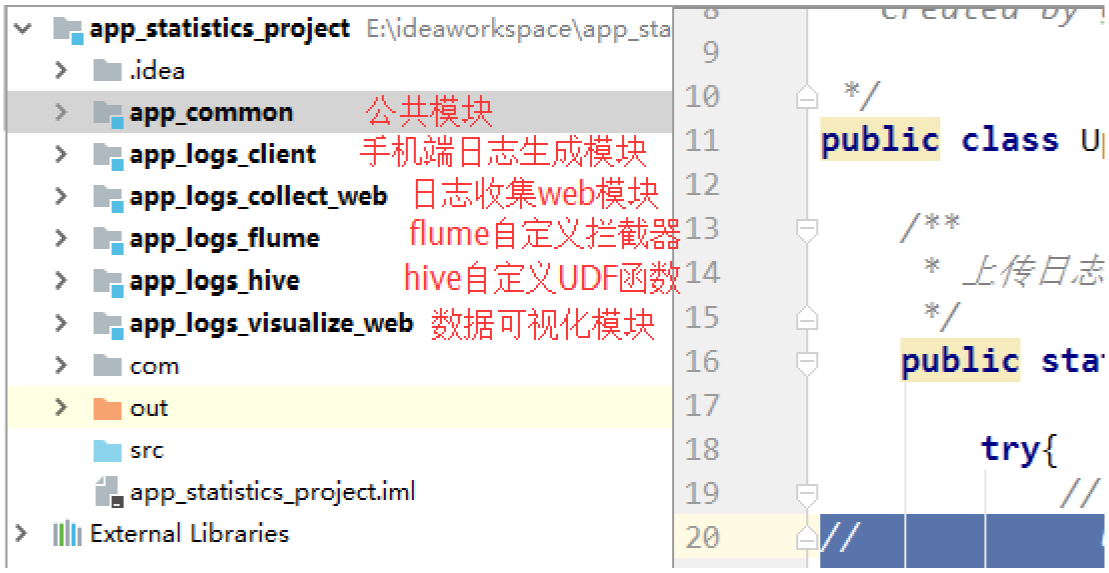
3）Flume 分别消费 kafka 中的 5 种主题信息，并把数据存储到 HDFS 上。

4）通过 crontab 任务调度定时把 HDFS 中的信息拷贝到 Hive 数据仓库中。

5）核心业务操作采用 Hive 查询。

6）查询结果通过数据展示平台展示。

3.2 项目目录结构


app_statistics_project E:\ideaworkspace\app_sta
.idea
app_common 公共模块
app_logs_client 手机端日志生成模块
app_logs_collect_web 日志收集web模块
app_logs_flume flume自定义拦截器
app_logs_hive hive自定义UDF函数
app_logs_visualize_web 数据可视化模块
com
out
src
app_statistics_project.iml
External Libraries

```
 */
public class U
    /**
     * 上传日志
     */
    public sta
        try{
            //
//
```

3.3 项目技术选型

1）Kafka_2.11-0.11.0.0

2）Zookeeper3.4.10

3）Hadoop2.7.2

4）Flume1.7.0

5）Tomcat7.0.72

6）Mysql 5.6.24

7）SSM 框架

8）echarts.js

3.4 项目整体集群规划

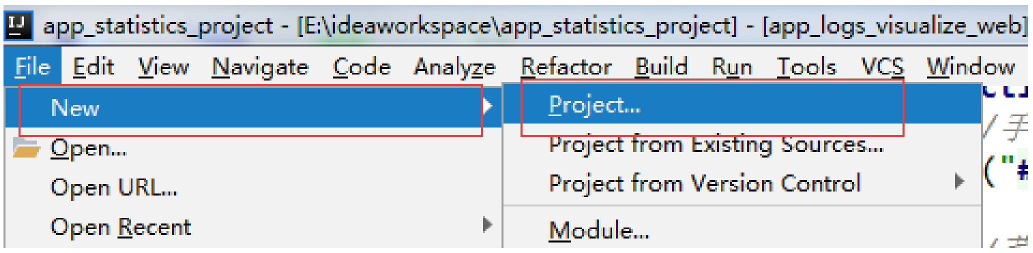
Hadoop102 主机	Hadoop103 主机	Hadoop104 主机
Zookeeper3.4.10	Zookeeper3.4.10	Zookeeper3.4.10
kafka_2.11-0.11.0.0	kafka_2.11-0.11.0.0	kafka_2.11-0.11.0.0
Flume1.7.0		

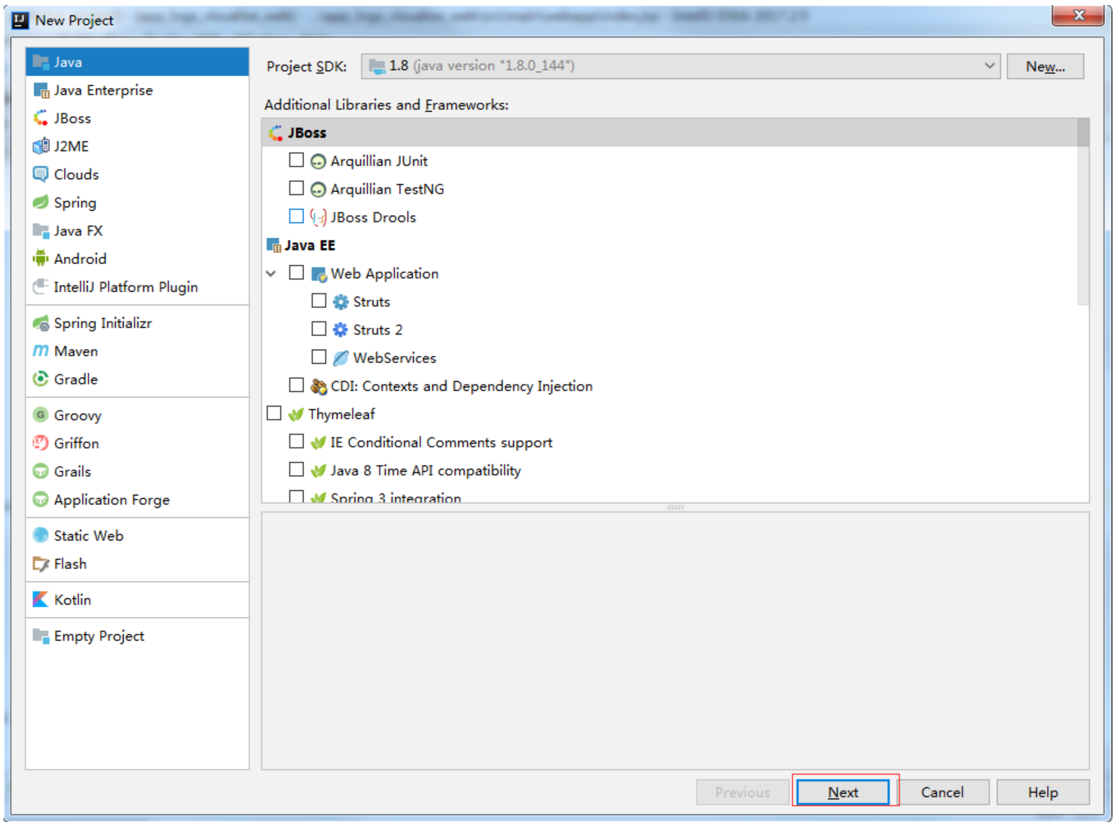
Hadoop2.7.2(namenode)
Hadoop(datanode)
	Hadoop2.7.2(datanode)	Hadoop2.7.2(datanode)
		Hadoop(secondarynamenode)

Hadoop(nodemanager)	Hadoop(nodemanager)
	Hadoop(resourcemanager)
		Hadoop(nodemanager)

Tomcat7.0.72		
	Hive1.2.1	
Mysql 5.6.24		

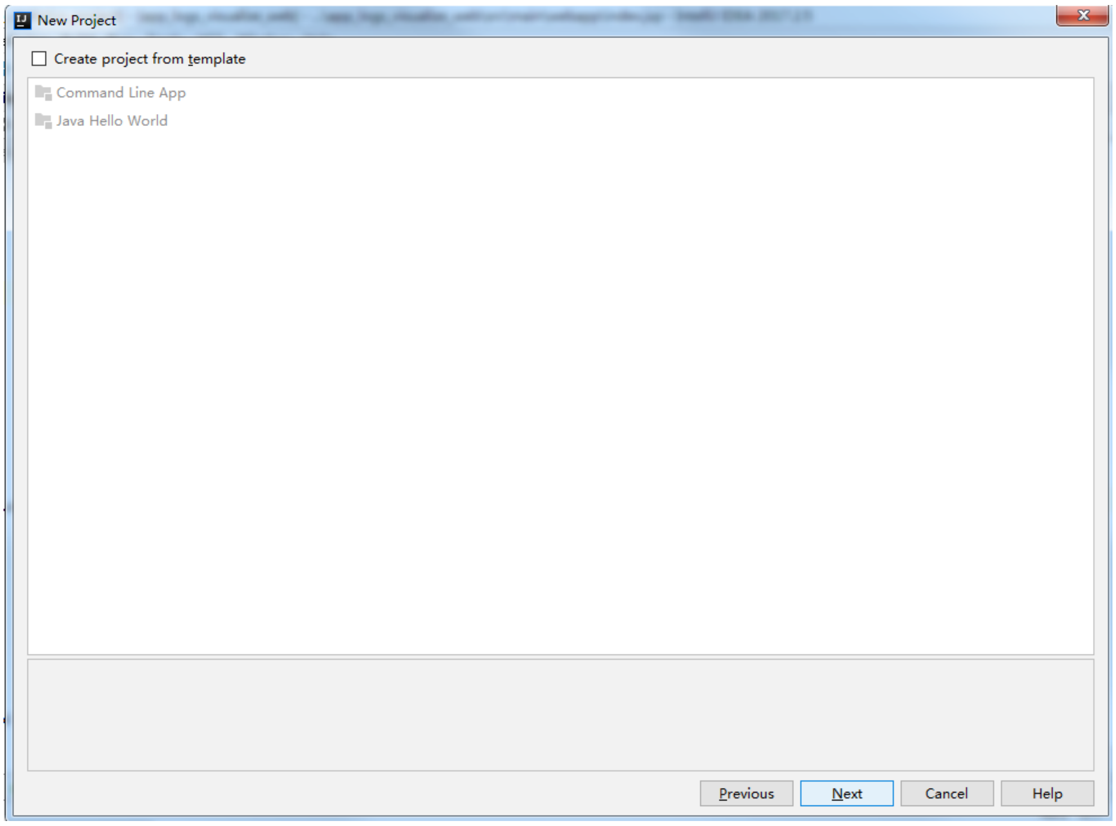
3.5 创建项目工程

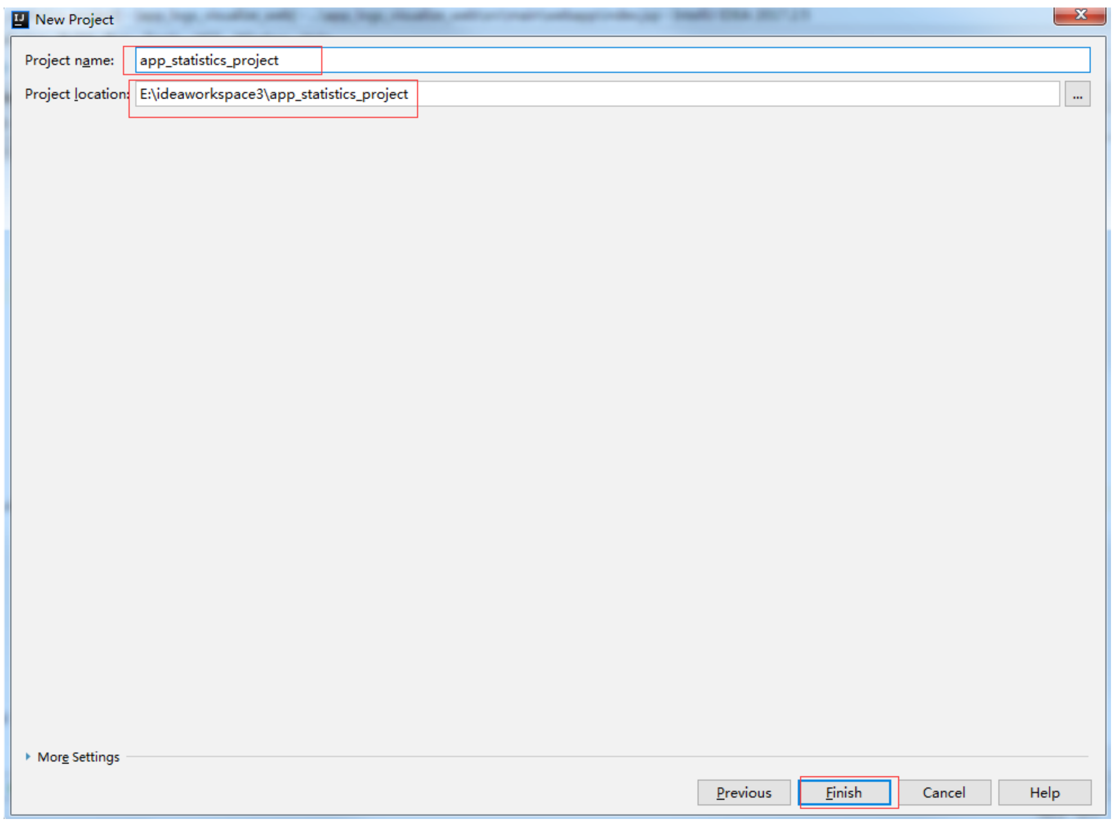

app_statistics_project - [E:\ideaworkspace\app_statistics_project] - [app_logs_visualize_web]


New Project

Project SDK: 1.8 (java version "1.8.0_144")

Additional Libraries and Frameworks:





Project name: app_statistics_project

Project location: E:\ideaworkspace3\app_statistics_project

四 APP 数据生成模块

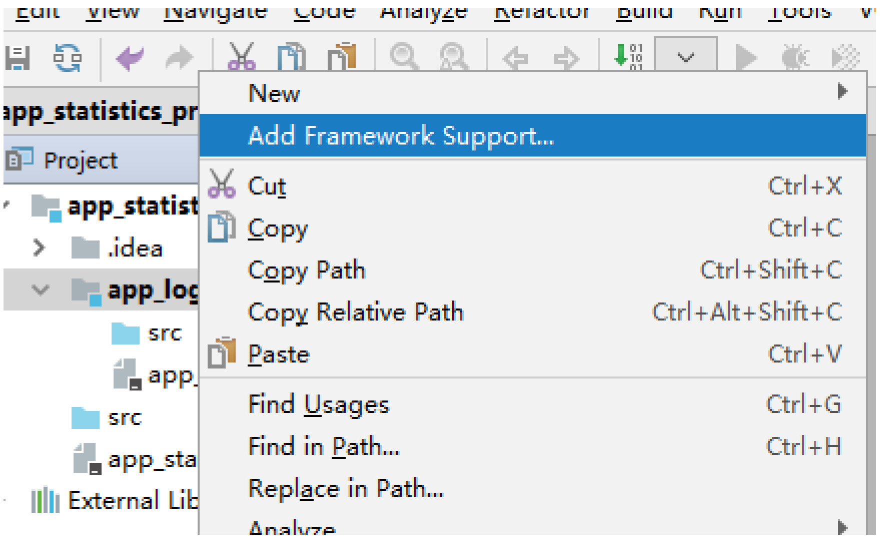
4.1 创建公共模块工程

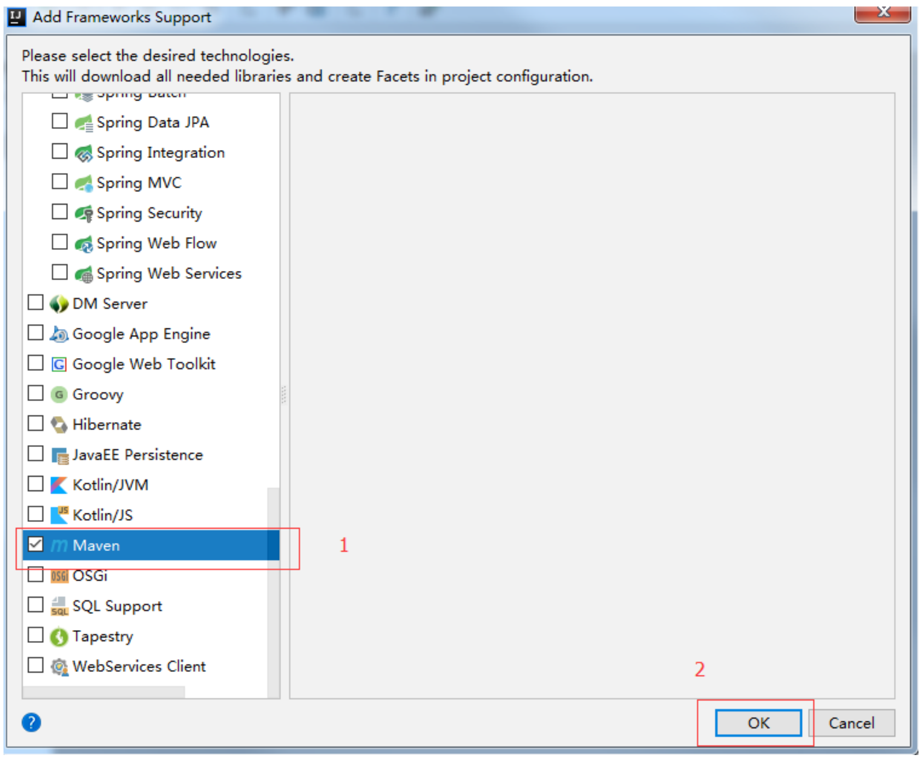
4.1.1 创建 Java 工程，导入 pom 文件

1）创建 app_logs_common 工程，主要用于编写公共的 javabean 和工具类。

2）添加 maven

在 app_logs_common 模块上方右键，选择 Add Framework Support…->勾选 maven，然后点击 OK。




Add Frameworks Support

Please select the desired technologies.
This will download all needed libraries and create Facets in project configuration.

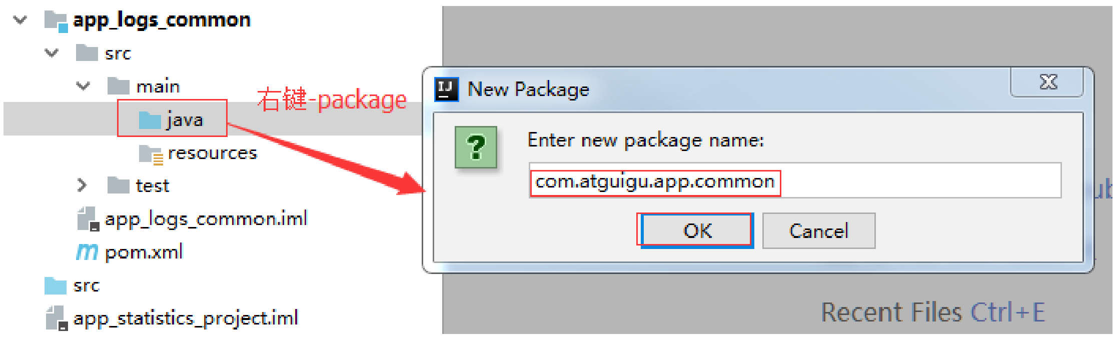
- [ ] Spring Batch
- [ ] Spring Data JPA
- [ ] Spring Integration
- [ ] Spring MVC
- [ ] Spring Security
- [ ] Spring Web Flow
- [ ] Spring Web Services
- [ ] DM Server
- [ ] Google App Engine
- [ ] Google Web Toolkit
- [ ] Groovy
- [ ] Hibernate
- [ ] JavaEE Persistence
- [ ] Kotlin/JVM
- [ ] Kotlin/JS
- [x] Maven
- [ ] OSGi
- [ ] SQL Support
- [ ] Tapestry
- [ ] WebServices Client

3）导入 pom 文件，并刷新一下 maven

```
<?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.atguigu</groupId>
    <artifactId>app_common</artifactId>
    <version>1.0-SNAPSHOT</version>

    <dependencies>
        <!--地理信息工具类-->
        <dependency>
            <groupId>com.maxmind.db</groupId>
            <artifactId>maxmind-db</artifactId>
            <version>1.0.0</version>
        </dependency>

        <!--地理信息工具类，类加载-->
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-core</artifactId>
            <version>4.3.4.RELEASE</version>
        </dependency>
    </dependencies>
</project>
```

4.1.2 创建 AppBaseLog 基类

1）创建 package：com.atguigu.app.common



2）编写具体的类

```
package com.atguigu.app.common;
```

```
import java.io.Serializable;
/**
 * AppBaseLog
 */
public class AppBaseLog implements Serializable {
	private Long createdAtMs;		//日志创建时间
	private String appId;			//应用唯一标识
	private String tenantId;		//租户唯一标识,企业用户
	private String deviceId;		//设备唯一标识
	private String appVersion;		//版本
	private String appChannel;		//渠道,安装时就在清单中制定了,appStore 等。
	private String appPlatform;		//平台
	private String osType;			//操作系统
	private String deviceStyle;		//机型

	public Long getCreatedAtMs() {
		return createdAtMs;
	}

	public void setCreatedAtMs(Long createdAtMs) {
		this.createdAtMs = createdAtMs;
	}

	public String getAppId() {
		return appId;
	}

	public void setAppId(String appId) {
		this.appId = appId;
	}

	public String getTenantId() {
		return tenantId;
	}

	public void setTenantId(String tenantId) {
		this.tenantId = tenantId;
	}

	public String getDeviceId() {
		return deviceId;
	}
	public void setDeviceId(String deviceId) {
		this.deviceId = deviceId;
	}

	public String getAppVersion() {
		return appVersion;
	}

	public void setAppVersion(String appVersion) {
		this.appVersion = appVersion;
	}

	public String getAppChannel() {
		return appChannel;
	}

	public void setAppChannel(String appChannel) {
		this.appChannel = appChannel;
	}

	public String getAppPlatform() {
		return appPlatform;
	}

	public void setAppPlatform(String appPlatform) {
		this.appPlatform = appPlatform;
	}

	public String getOsType() {
		return osType;
	}

	public void setOsType(String osType) {
		this.osType = osType;
	}

	public String getDeviceStyle() {
		return deviceStyle;
	}

	public void setDeviceStyle(String deviceStyle) {
		this.deviceStyle = deviceStyle;
	}
```

```
}
```

4.1.3 创建 AppErrorLog 错误日志类

```
package com.atguigu.app.common;
/**
 * 应用上报的 app 错误日志相关信息
 */
public class AppErrorLog extends AppBaseLog {

    private String errorBrief;      //错误摘要
    private String errorDetail;         //错误详情

    public String getErrorBrief() {
        return errorBrief;
    }

    public void setErrorBrief(String errorBrief) {
        this.errorBrief = errorBrief;
    }

    public String getErrorDetail() {
        return errorDetail;
    }

    public void setErrorDetail(String errorDetail) {
        this.errorDetail = errorDetail;
    }
}
```

4.1.4 创建 AppEventLog 事件日志类

```
package com.atguigu.app.common;
import java.util.Map;
/**
 * 应用上报的事件相关信息
 */
public class AppEventLog extends AppBaseLog {

     private String eventId;                                //事件唯一标识
     private Long eventDurationSecs;                         //事件持续时长
     private Map<String,String> paramKeyValueMap;        //参数名/值对

	public String getEventId() {
		return eventId;
	}

	public void setEventId(String eventId) {
		this.eventId = eventId;
	}

	public Long getEventDurationSecs() {
		return eventDurationSecs;
	}

	public void setEventDurationSecs(Long eventDurationSecs) {
		this.eventDurationSecs = eventDurationSecs;
	}

	public Map<String, String> getParamKeyValueMap() {
		return paramKeyValueMap;
	}

	public void setParamKeyValueMap(Map<String, String> paramKeyValueMap) {
		this.paramKeyValueMap = paramKeyValueMap;
	}
}
```

4.1.5 创建 AppPageLog 页面日志类

```
package com.atguigu.app.common;
/**
 * 应用上报的页面相关信息
 */
public class AppPageLog extends AppBaseLog {

	private String pageId;                          //页面 id
	private int visitIndex = 0;                     //访问顺序号，0 为第一个页面
	private String nextPage;            //下一个访问页面，如为空则表示为退出应用的页面
	private Long stayDurationSecs = (long) 0;          //当前页面停留时长

	public String getPageId() {
		return pageId;
	}

	public void setPageId(String pageId) {
		this.pageId = pageId;
	}

	public int getVisitIndex() {
		return visitIndex;
	}

	public void setVisitIndex(int visitIndex) {
		this.visitIndex = visitIndex;
	}

	public String getNextPage() {
		return nextPage;
	}

	public void setNextPage(String nextPage) {
		this.nextPage = nextPage;
	}

	public Long getStayDurationSecs() {
		return stayDurationSecs;
	}

	public void setStayDurationSecs(Long stayDurationSecs) {
		this.stayDurationSecs = stayDurationSecs;
	}
}
```

4.1.6 创建 AppStartupLog 启动日志类

```
package com.atguigu.app.common;
/**
 * 启动日志
 */
public class AppStartupLog extends AppBaseLog {
	private String country;			//国家，终端不用上报，服务器自动填充该属性
	private String province;		//省份，终端不用上报，服务器自动填充该属性
	private String ipAddress;		//ip 地址

	private String network;			//网络
	private String carrier;			//运营商

	private String brand;			//品牌
	private String screenSize;		//分辨率

	public String getCountry() {
		return country;
	}

	public void setCountry(String country) {
		this.country = country;
	}

	public String getProvince() {
		return province;
	}

	public void setProvince(String province) {
		this.province = province;
	}

	public String getIpAddress() {
		return ipAddress;
	}

	public void setIpAddress(String ipAddress) {
		this.ipAddress = ipAddress;
	}

	public String getNetwork() {
		return network;
	}

	public void setNetwork(String network) {
		this.network = network;
	}

	public String getCarrier() {
		return carrier;
	}

	public void setCarrier(String carrier) {
		this.carrier = carrier;
	}

	public String getBrand() {
		return brand;
	}

	public void setBrand(String brand) {
		this.brand = brand;
	}

	public String getScreenSize() {
		return screenSize;
	}

	public void setScreenSize(String screenSize) {
		this.screenSize = screenSize;
	}
}
```

4.1.7 创建 AppUsageLog 使用时长日志类

```
package com.atguigu.app.common;
/**
 * 应用上报的使用时长相关信息
 */
public class AppUsageLog extends AppBaseLog {

	private  Long  singleUseDurationSecs;		//单次使用时长(秒数),指一次启动内应
用在前台的持续时长
	private Long singleUploadTraffic;		//单次使用过程中的上传流量
	private Long singleDownloadTraffic;		//单次使用过程中的下载流量

	public Long getSingleUseDurationSecs() {
		return singleUseDurationSecs;
	}

	public void setSingleUseDurationSecs(Long singleUseDurationSecs) {
		this.singleUseDurationSecs = singleUseDurationSecs;
	}

	public Long getSingleUploadTraffic() {
		return singleUploadTraffic;
	}

	public void setSingleUploadTraffic(Long singleUploadTraffic) {
		this.singleUploadTraffic = singleUploadTraffic;
```

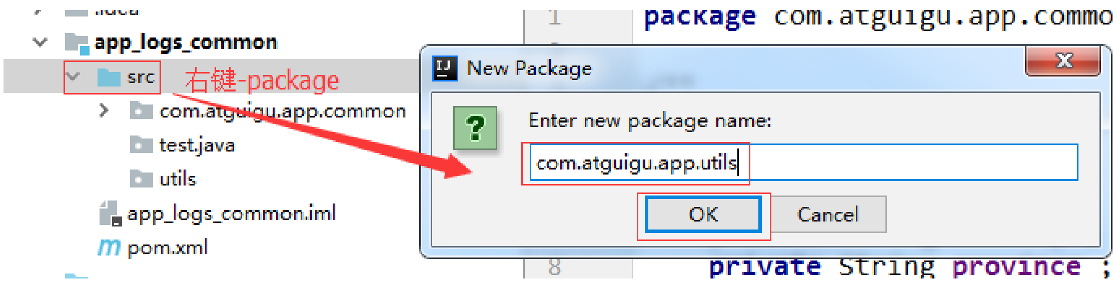
```
    }

    public Long getSingleDownloadTraffic() {
        return singleDownloadTraffic;
    }

    public void setSingleDownloadTraffic(Long singleDownloadTraffic) {
        this.singleDownloadTraffic = singleDownloadTraffic;
    }
}
```

4.1.8 创建 GeoInfo 地理信息类

```
package com.atguigu.app.common;
/**
 * 地理信息
 */
public class GeoInfo {
    private String country ;
    private String province ;

    public String getCountry() {
        return country;
    }

    public void setCountry(String country) {
        this.country = country;
    }

    public String getProvince() {
        return province;
    }

    public void setProvince(String province) {
        this.province = province;
    }
}
```

4.1.9 创建 GeoUtil 地理信息工具类

1）创建一个工具类包：com.atguigu.app.utils



2）编写工具类：

地理信息数据库官方地址：https://www.maxmind.com/zh/geoip2-databases

API 使用说明：http://maxmind.github.io/GeoIP2-java/

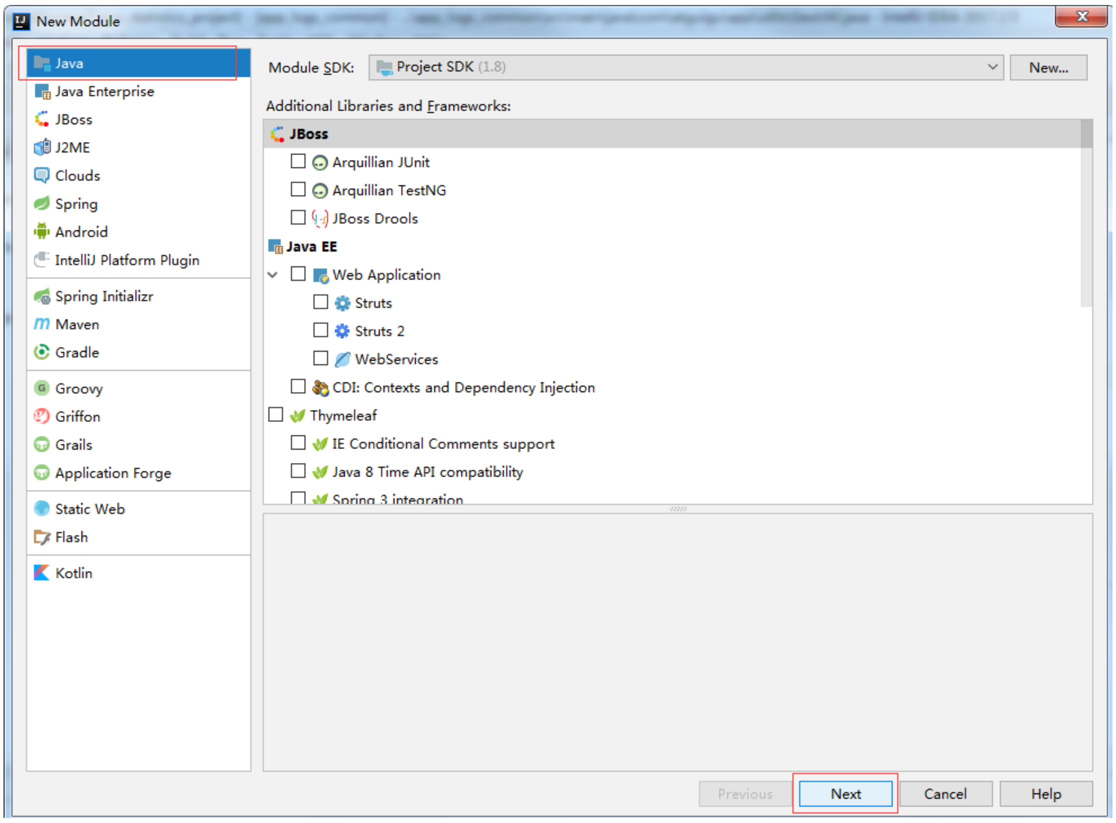
```
package com.atguigu.app.utils;
import com.atguigu.app.common.GeoInfo;
import com.fasterxml.jackson.databind.JsonNode;
import com.maxmind.db.Reader;
import org.springframework.core.io.ClassPathResource;
import org.springframework.core.io.Resource;
import java.io.IOException;
import java.io.InputStream;
import java.net.InetAddress;

/**
 * 地理工具类，实现通过 ip 查找地址区域
 */
public class GeoUtil {
    private static InputStream in;
    private static Reader reader;

    /**
     * 获得国家数据
     */
    public static String getCountry(String ip) {

        try {
            Resource resource = new ClassPathResource("GeoLite2-City.mmdb");
            reader = new Reader(resource.getFile());

            if (reader != null) {

                JsonNode node = reader.get(InetAddress.getByName(ip));

                if (node != null){
                    JsonNode countryNode = node.get("country");
```

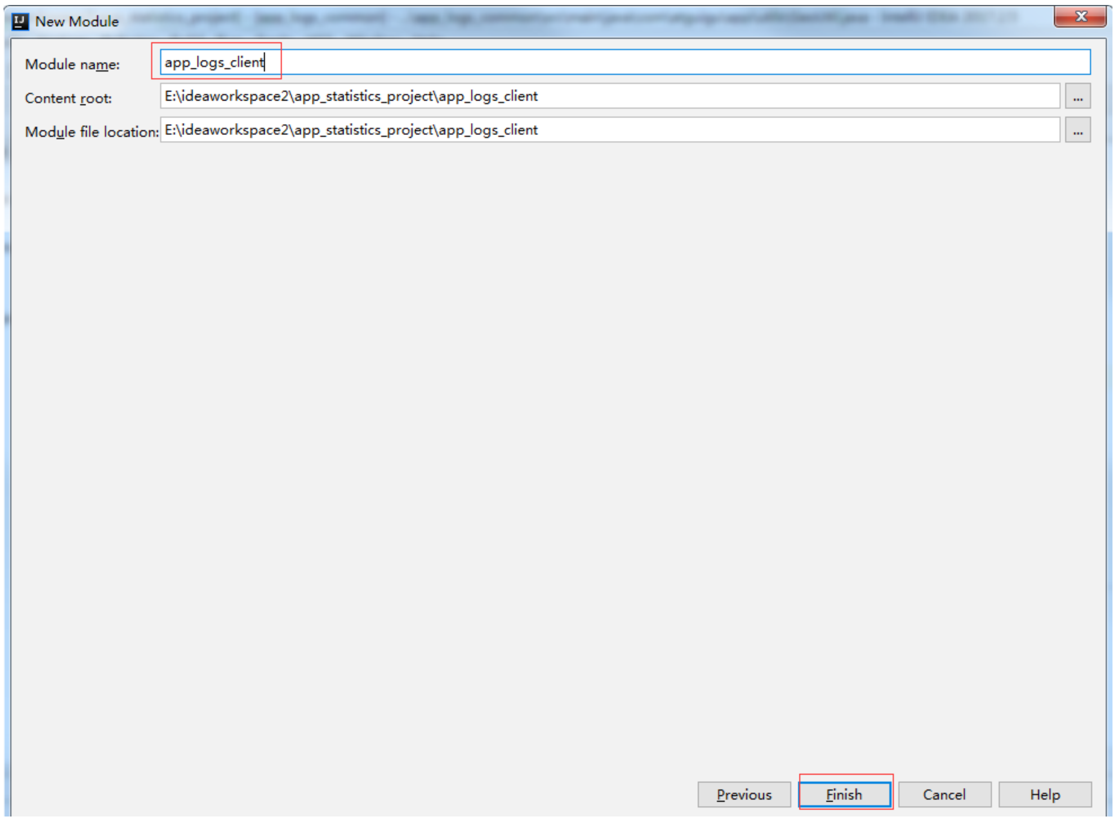
```
                        if (countryNode != null ){
                            JsonNode namesNode = countryNode.get("names");

                            if (namesNode != null){
                                JsonNode zhNode = namesNode.get("zh-CN");

                                if (zhNode != null){
                                    return zhNode.textValue();
                                }
                            }
                        }
                    }
                }
            } catch (Exception e) {
                e.printStackTrace();
            }finally {
                if (reader != null){
                    try {
                        reader.close();
                    } catch (IOException e) {
                        e.printStackTrace();
                    }
                }
            }

            return "";
        }

        /**
         * 获得省份数据
         */
        public static String getProvince(String ip) {

            try {

                Resource resource = new ClassPathResource("GeoLite2-City.mmdb");
                reader = new Reader(resource.getFile());

                if (reader != null) {
                    JsonNode node = reader.get(InetAddress.getByName(ip));

                    if (node != null){
                        JsonNode subdivisionsNode = node.get("subdivisions");
                        if (subdivisionsNode != null){
                            JsonNode areaNode = subdivisionsNode.get(0);

                            if (areaNode != null){
                                JsonNode namesNode = areaNode.get("names");

                                if (namesNode != null){
                                    JsonNode zhNode = namesNode.get("zh-CN");

                                    if (zhNode != null){
                                        return zhNode.textValue();
                                    }
                                }
                            }
                        }
                    }
                }
            } catch (Exception e) {
                e.printStackTrace();
            }finally {
                if (reader != null){
                    try {
                        reader.close();
                    } catch (IOException e) {
                        e.printStackTrace();
                    }
                }
            }

            return "";
        }
}
```

4.2 编写手机客户端工程

4.2.1 创建 Java 工程，导入 pom 文件

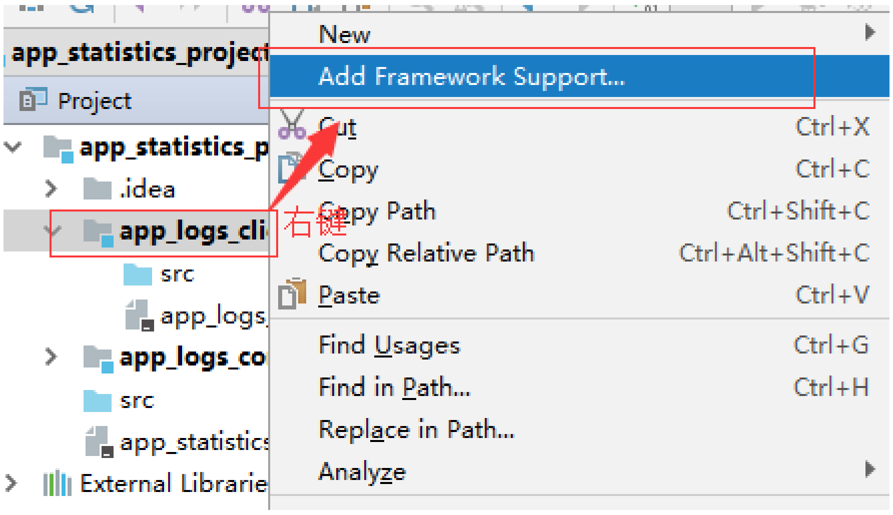
1）创建 app_logs_client 模块

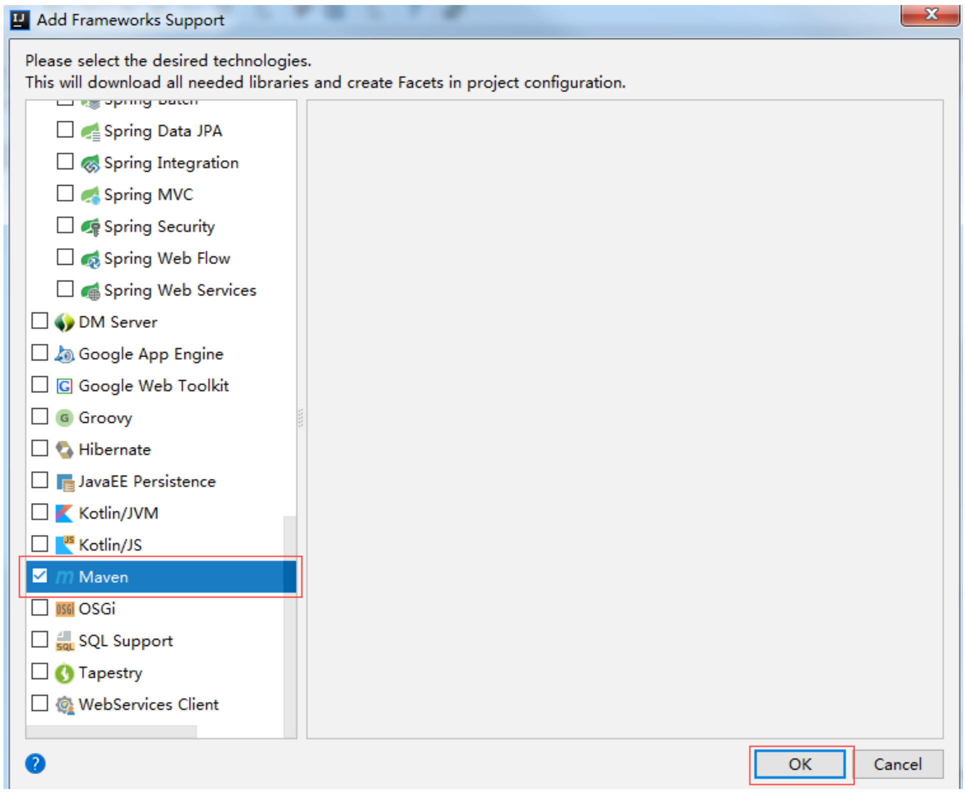




Module name: app_logs_client
Content root: E:\ideaworkspace2\app_statistics_project\app_logs_client
Module file location: E:\ideaworkspace2\app_statistics_project\app_logs_client

2）添加 maven




Add Frameworks Support

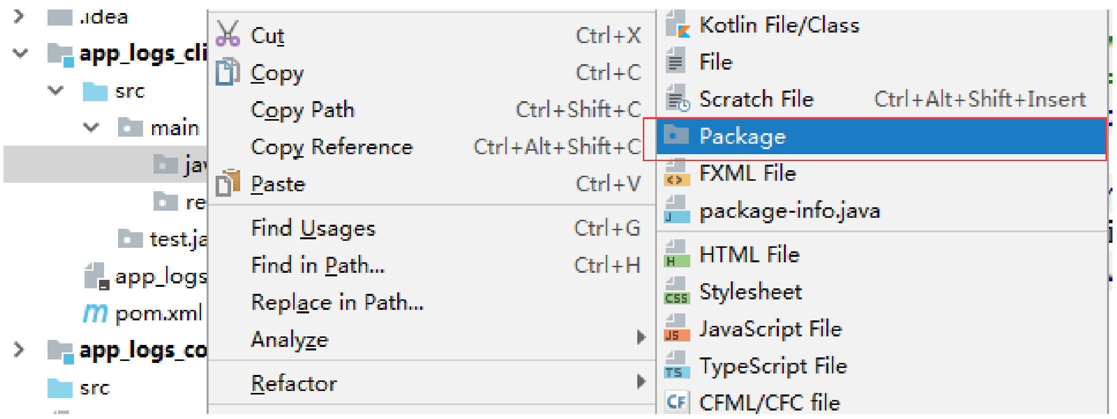
Please select the desired technologies.
This will download all needed libraries and create Facets in project configuration.

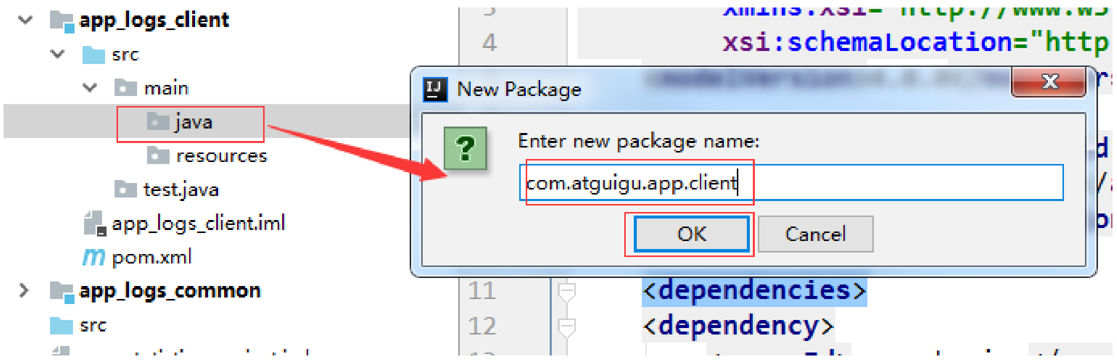
3）导入 pom 文件，并刷新一下 maven

```
<?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.atguigu</groupId>
    <artifactId>app_logs_client</artifactId>
    <version>1.0-SNAPSHOT</version>
    <dependencies>
        <dependency>
            <groupId>com.atguigu</groupId>
            <artifactId>app_common</artifactId>
            <version>1.0-SNAPSHOT</version>
        </dependency>

        <!--json 解析-->
        <dependency>
            <groupId>com.alibaba</groupId>
            <artifactId>fastjson</artifactId>
            <version>1.2.6</version>
        </dependency>
    </dependencies>
</project>
```

4.2.2 创建 GenerateData 数据生成类

1）创建 package：com.atguigu.app.client





2）编写代码

```
package com.atguigu.app.client;
import com.alibaba.fastjson.JSONObject;
import com.atguigu.app.common.*;
import java.util.HashMap;
import java.util.Map;
import java.util.Random;

/**
 * Created by atguigu on 2017/10/25
 */
public class GenerateData {
    // 0  创建随机数对象
    private static Random random = new Random();

    // 1  准备没类 log 的属性值
    // 1.1  功能属性值
    private static Long[] createdAtMsS = initCreatedAtMs();// 日志创建时间
    private static String appId = "sdk34734";//应用唯一标识
    private static String[] tenantIds = {"cake"};//租户唯一标识,企业用户
    private static String[] deviceIds = initDeviceId();//设备唯一标识
    private static String[] appVersions = {"3.2.1", "3.2.2"};//版本
    private static String[] appChannels = {"youmeng1", "youmeng2"};//渠道,安装时就在
清单中制定了，appStore 等。
    private static String[] appPlatforms = {"android", "ios"};//平台
    private static String[] osTypes = {"8.3", "7.1.1"};//操作系统
    private static String[] deviceStyles = {"iPhone 6", "iPhone 6 Plus", "红米手机 1s"};//
机型

    // 1.1.1  初始化设备 id
    private static String[] initDeviceId() {

        String base = "device22";
        String[] result = new String[100];

        for (int i = 0; i < 100; i++) {
            result[i] = base + i + "";
        }

        return result;
    }

    // 1.1.2  初始化创建时间
    private static Long[] initCreatedAtMs() {

        Long createdAtMs = System.currentTimeMillis();
        Long[] result = new Long[11];

        for (int i = 0; i < 10; i++) {
            result[i] = createdAtMs - (long) (i * 24 * 3600 * 1000);
        }

        result[10] = createdAtMs;

        return result;
    }

    // 1.2  启动日志属性值
    private static String[] countrys = {"America", "china"};//国家，终端不用上报，服务器自动填充该属性
    private static String[] provinces = {"Washington", "jiangxi", "beijing"};//省份，终端不用上报，服务器自动填充该属性
    private static String[] networks = {"WiFi", "CellNetwork"};//网络
    private static String[] carriers = {"中国移动", "中国电信", "EE"};//运营商
    private static String[] brands = {"三星", "华为", "Apple", "魅族", "小米", "锤子"};//品牌
    private static String[] screenSizes = {"1136*640", "960*640", "480*320"};//分辨率

    // 1.3  事件日志属性值
    private static String[] eventIds = {"popMenu", "autoImport", "BookStore"}; //事件唯一标识
    private static Long[] eventDurationSecsS = {new Long(25), new Long(67), new Long(45)};//事件持续时长
    static Map<String, String> map1 = new HashMap<String, String>() {
        {
            put("testparam1key", "testparam1value");
            put("testparam2key", "testparam2value");
        }
    };

    static Map<String, String> map2 = new HashMap<String, String>() {
        {
            put("testparam3key", "testparam3value");
            put("testparam4key", "testparam4value");
        }
    };
    private static Map[] paramKeyValueMapsS = {map1, map2};//参数名/值对
    // 1.4  使用时长日志属性值
    private static Long[] singleUseDurationSecsS = initSingleUseDurationSecs();// 单次使用时长(秒数),指一次启动内应用在前台的持续时长

    // 1.4.1  单次使用时长
    private static Long[] initSingleUseDurationSecs() {

        Long[] result = new Long[200];

        for (int i = 1; i < 200; i++) {
            result[i] = (long) random.nextInt(200);
        }

        return result;
    }

    // 1.5  错误日志属性值
    private static String[] errorBriefs = {"at cn.lift.dfdf.web.AbstractBaseController.validInbound(AbstractBaseController.java:72)", "at cn.lift.appIn.control.CommandUtil.getInfo(CommandUtil.java:67)"};        // 错误摘要
    private static String[] errorDetails = {"java.lang.NullPointerException\\n    " + "at cn.lift.appIn.web.AbstractBaseController.validInbound(AbstractBaseController.java:72)\\n " + "at cn.lift.dfdf.web.AbstractBaseController.validInbound", "at cn.lift.dfdfdf.control.CommandUtil.getInfo(CommandUtil.java:67)\\n " + "at sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43)\\n" + " at java.lang.reflect.Method.invoke(Method.java:606)\\n"};        // 错误详情

    // 1.6  页面使用情况日志属性值
    private static String[] pageIds = {"list.html", "main.html", "test.html"};// 页面 id
    private static int[] visitIndexs = {0, 1, 2, 3, 4};// 访问顺序号，0 为第一个页面
    private static String[] nextPages = {"list.html", "main.html", "test.html", null}; // 下一个访问页面，如为空则表示为退出应用的页面
    private static Long[] stayDurationSecsS = {new Long(45), new Long(2), new Long(78)};// 当前页面停留时长


    // 2  初始化五类 log 的数据
    // 启动相关信息的数组
    private static AppStartupLog[] appStartupLogs = initAppStartupLogs();
    // 页面跳转相关信息的数组
    private static AppPageLog[] appPageLogs = initAppPageLogs();
```

```
//事件相关信息的数组
private static AppEventLog[] appEventLogs = initAppEventLogs();
//app 使用情况相关信息的数组
private static AppUsageLog[] appUsageLogs = initAppUsageLogs();
//错误相关信息的数组
private static AppErrorLog[] appErrorLogs = initAppErrorLogs();

// 2.1  初始化每类 log 的公共属性值
private static void initLogCommon(AppBaseLog baselog){
	//  日志创建时间
	baselog.setCreatedAtMs(System.currentTimeMillis());
	// appid
	baselog.setAppId(appId);
	//  租户唯一标识,企业用户
	String tenantId = tenantIds[random.nextInt(tenantIds.length)];
	if (tenantId != null) {
		baselog.setTenantId(tenantId);
	}
	baselog.setTenantId(tenantIds[random.nextInt(tenantIds.length)]);
	//  设备唯一标识
	baselog.setDeviceId(deviceIds[random.nextInt(deviceIds.length)]);
	//  版本
	baselog.setAppVersion(appVersions[random.nextInt(appVersions.length)]);
	//  渠道
	baselog.setAppChannel(appChannels[random.nextInt(appChannels.length)]);
	//  平台
	baselog.setAppPlatform(appPlatforms[random.nextInt(appPlatforms.length)]);
	//  操作系统
	baselog.setOsType(osTypes[random.nextInt(osTypes.length)]);
	//  机型
	baselog.setDeviceStyle(deviceStyles[random.nextInt(deviceStyles.length)]);
}

// 2.2  启动相关信息的数组
private static AppStartupLog[] initAppStartupLogs() {

	AppStartupLog[] result = new AppStartupLog[10];

	for (int i = 0; i < 10; i++) {
		AppStartupLog appStartupLog = new AppStartupLog();

		//  初始化公共屬性值
		initLogCommon(appStartupLog);
```

```
            //国家
            appStartupLog.setCountry(countrys[random.nextInt(countrys.length)]);
            //省份
            appStartupLog.setProvince(provinces[random.nextInt(provinces.length)]);
            //网络
            appStartupLog.setNetwork(networks[random.nextInt(networks.length)]);
            //运营商
            appStartupLog.setCarrier(carriers[random.nextInt(carriers.length)]);
            //品牌
            appStartupLog.setBrand(brands[random.nextInt(brands.length)]);
            //分辨率

appStartupLog.setScreenSize(screenSizes[random.nextInt(screenSizes.length)]);

            result[i] = appStartupLog;
        }

        return result;
    }

    // 2.3  页面跳转相关信息的数组
    private static AppPageLog[] initAppPageLogs() {

        AppPageLog[] result = new AppPageLog[10];

        for (int i = 0; i < 10; i++) {

            AppPageLog appPageLog = new AppPageLog();

            // 初始化公共屬性值
            initLogCommon(appPageLog);

            // 页面 id
            String pageId = pageIds[random.nextInt(pageIds.length)];
            appPageLog.setPageId(pageId);

            // 访问頁面顺序号
            int visitIndex = visitIndexs[random.nextInt(visitIndexs.length)];
            appPageLog.setVisitIndex(visitIndex);

            // 下一个访问页面，如为空则表示为退出应用的页面
            String nextPage = nextPages[random.nextInt(nextPages.length)];
```

```
                while (pageId.equals(nextPage)) {
                    nextPage = nextPages[random.nextInt(nextPages.length)];
                }
                appPageLog.setNextPage(nextPage);

                //当前页面停留时长
                Long                    stayDurationSecs                    =
stayDurationSecsS[random.nextInt(stayDurationSecsS.length)];
                appPageLog.setStayDurationSecs(stayDurationSecs);

                result[i] = appPageLog;
            }

            return result;
        }

        // 2.4  事件相关信息的数组
        private static AppEventLog[] initAppEventLogs() {

            AppEventLog[] result = new AppEventLog[10];

            for (int i = 0; i < 10; i++) {
                AppEventLog appEventLog = new AppEventLog();

                //  初始化公共屬性值
                initLogCommon(appEventLog);

                //事件唯一标识
                appEventLog.setEventId(eventIds[random.nextInt(eventIds.length)]);
                //事件持续时长

appEventLog.setEventDurationSecs(eventDurationSecsS[random.nextInt(eventDurationSecsS.
length)]);
                //  事件参数

appEventLog.setParamKeyValueMap(paramKeyValueMapsS[random.nextInt(paramKeyValue
MapsS.length)]);

                result[i] = appEventLog;
            }

            return result;
        }
```

```
    // 2.5 app 使用情况相关信息的数组
    private static AppUsageLog[] initAppUsageLogs() {

        AppUsageLog[] result = new AppUsageLog[10];

        for (int i = 0; i < 10; i++) {
            AppUsageLog appUsageLog = new AppUsageLog();

            //  初始化公共屬性值
            initLogCommon(appUsageLog);

            //单次使用时长(秒数),指一次启动内应用在前台的持续时长

appUsageLog.setSingleUseDurationSecs(singleUseDurationSecsS[random.nextInt(singleUse
DurationSecsS.length)]);

            result[i] = appUsageLog;
        }

        return result;
    }

    // 2.6  错误相关信息的数组
    private static AppErrorLog[] initAppErrorLogs() {

        AppErrorLog[] result = new AppErrorLog[10];

        for (int i = 0; i < 10; i++) {
            AppErrorLog appErrorLog = new AppErrorLog();

            initLogCommon(appErrorLog);

            //错误摘要
            appErrorLog.setErrorBrief(errorBriefs[random.nextInt(errorBriefs.length)]);
            //错误详情

appErrorLog.setErrorDetail(errorDetails[random.nextInt(errorDetails.length)]);

            result[i] = appErrorLog;
        }
        return result;
    }

    //3  循环发送数据
    public static void main(String[] args) {

        //发送数据
        for (int i = 1; i <= 200000000; i++) {

            AppLogEntity logEntity = new AppLogEntity();

            //  封装 5 种 log 数据
            logEntity.setAppStartupLogs(new
AppStartupLog[]{appStartupLogs[random.nextInt(appStartupLogs.length)]});
            logEntity.setAppEventLogs(new
AppEventLog[]{appEventLogs[random.nextInt(appEventLogs.length)]});
            logEntity.setAppErrorLogs(new
AppErrorLog[]{appErrorLogs[random.nextInt(appErrorLogs.length)]});
            logEntity.setAppPageLogs(new
AppPageLog[]{appPageLogs[random.nextInt(appPageLogs.length)]});
            logEntity.setAppUsageLogs(new
AppUsageLog[]{appUsageLogs[random.nextInt(appUsageLogs.length)]});

            try {
                //  将对象转换成 json string
                String json = JSONObject.toJSONString(logEntity);

                //  网络请求发送 json 数据
                UploadUtil.upload(json);

                //  每隔 5 秒发送一条数据
                Thread.sleep(5000);
            } catch (Exception e) {
                e.printStackTrace();
            }
        }
    }
}
```

4.2.3 创建数据上传的工具类

```
package com.atguigu.app.client;
import java.io.OutputStream;
import java.net.HttpURLConnection;
import java.net.URL;

/**
 * Created by atguigu on 2017/10/25
 */
public class UploadUtil {

    /**
     * 上传日志
     */
    public static void upload(String json) throws Exception {

        try{
            // 1 设置请求的 URL
//          URL url = new URL("http://hadoop102:8080/app_logs/coll/index");// 生产地址
            URL url = new URL("http://localhost:8080/coll/index");// 测试地址


            // 2 获取连接
            HttpURLConnection conn = (HttpURLConnection) url.openConnection();

            // 2.1 设置请求方式为 post
            conn.setRequestMethod("POST");

            // 2.2 允许上传数据
            conn.setDoOutput(true);

            // 2.3 时间头用来供 server 进行时钟校对的
            conn.setRequestProperty("clientTime",System.currentTimeMillis() + "");

            // 2.4 设置请求的头信息,设置内容类型
            conn.setRequestProperty("Content-Type", "application/json");

            // 3 获取输出流
            OutputStream out = conn.getOutputStream();
            // 3.1 向输出流里面写数据
            out.write(json.getBytes());
            out.flush();
            // 3.2 关闭资源
            out.close();

            // 4 获取响应码
```

```
                int code = conn.getResponseCode();
                System.out.println(code);
            }
            catch (Exception e){
                e.printStackTrace();
            }
        }
}
```

五 数据收集模块

5.1 Web 数据收集模块

5.1.0 数据收集模块集群部署规划

Hadoop102 主机	**Hadoop103 主机**	**Hadoop104 主机**
Zookeeper3.4.10	Zookeeper3.4.10	Zookeeper3.4.10
kafka_2.11-0.11.0.0	kafka_2.11-0.11.0.0	kafka_2.11-0.11.0.0
Flume1.7.0		

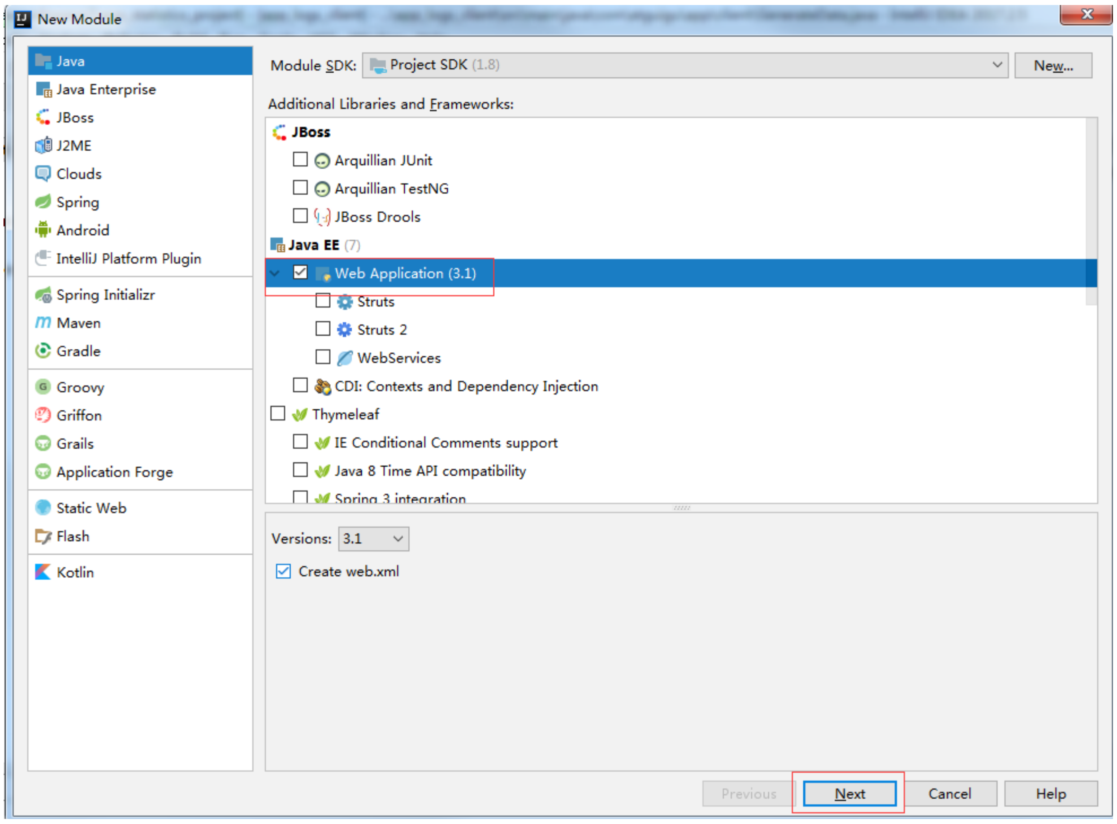
Hadoop2.7.2(namenode)
Hadoop(datanode)
	Hadoop2.7.2(datanode)	Hadoop2.7.2(datanode)
		Hadoop(secondarynamenode)

Hadoop(nodemanager)	Hadoop(nodemanager)
	Hadoop(resourcemanager)
		Hadoop(nodemanager)

Tomcat7.0.72		

5.1.1 创建 web 工程，导入 pom 文件

1）创建 web 工程：app_logs_collect_web

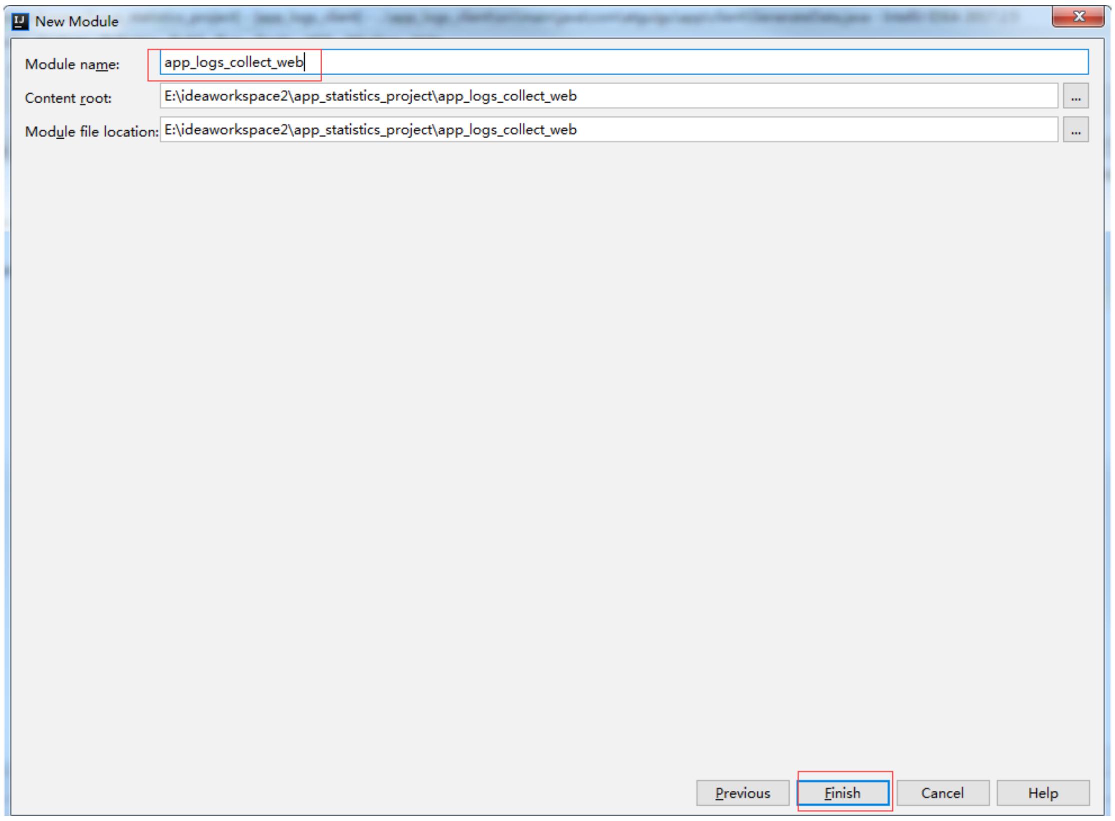


Module SDK: Project SDK (1.8)

☑ Web Application (3.1)

Versions: 3.1

☑ Create web.xml

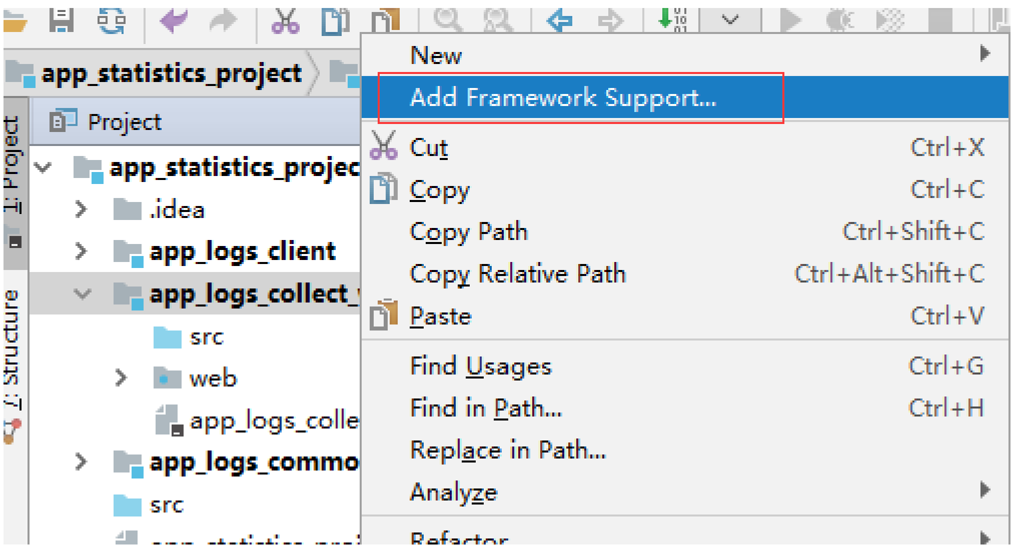


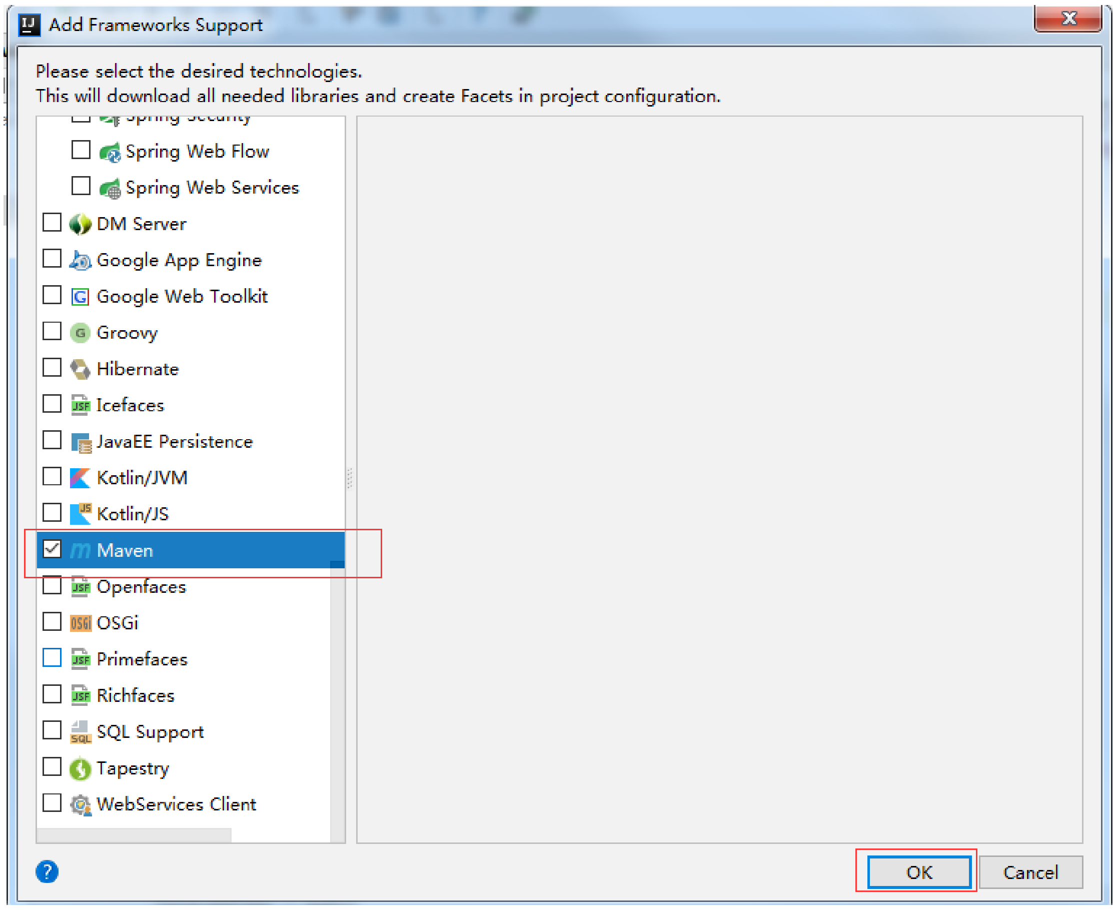
Module name: app_logs_collect_web

Content root: E:\ideaworkspace2\app_statistics_project\app_logs_collect_web

Module file location: E:\ideaworkspace2\app_statistics_project\app_logs_collect_web

2）添加 maven 工具




Add Frameworks Support

Please select the desired technologies.
This will download all needed libraries and create Facets in project configuration.

- [ ] Spring Web Flow
- [ ] Spring Web Services
- [ ] DM Server
- [ ] Google App Engine
- [ ] Google Web Toolkit
- [ ] Groovy
- [ ] Hibernate
- [ ] Icefaces
- [ ] JavaEE Persistence
- [ ] Kotlin/JVM
- [ ] Kotlin/JS
- [✓] Maven
- [ ] Openfaces
- [ ] OSGi
- [ ] Primefaces
- [ ] Richfaces
- [ ] SQL Support
- [ ] Tapestry
- [ ] WebServices Client

3）导入 pom 文件，并刷新一下 maven

```
<?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.atguigu</groupId>
    <artifactId>app_logs_collect_web</artifactId>
    <version>1.0-SNAPSHOT</version>
    <packaging>war</packaging>

    <!--tomcat 插件-->
    <build>
        <plugins>
            <plugin>
                <groupId>org.apache.tomcat.maven</groupId>
                <artifactId>tomcat7-maven-plugin</artifactId>
                <version>2.2</version>
                <configuration>
                    <!-- http port -->
                    <port>8080</port>
                    <path>/</path>
                </configuration>
            </plugin>
        </plugins>
    </build>

    <!--日志框架版本号-->
    <properties>
        <log4j.version>1.2.17</log4j.version>
        <slf4j.version>1.7.22</slf4j.version>
    </properties>

    <dependencies>
        <!--spring 框架-->
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-context-support</artifactId>
            <version>4.3.4.RELEASE</version>
        </dependency>

        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-webmvc</artifactId>
            <version>4.3.4.RELEASE</version>
        </dependency>
        <dependency>
            <groupId>commons-io</groupId>
            <artifactId>commons-io</artifactId>
            <version>2.5</version>
        </dependency>

        <dependency>
            <groupId>org.apache.commons</groupId>
            <artifactId>commons-pool2</artifactId>
            <version>2.4.2</version>
        </dependency>
        <dependency>
            <groupId>javax.servlet</groupId>
            <artifactId>javax.servlet-api</artifactId>
            <version>3.0.1</version>
            <scope>provided</scope>
        </dependency>

        <!--kafka 框架-->
        <dependency>
            <groupId>org.apache.kafka</groupId>
            <artifactId>kafka-clients</artifactId>
            <version>0.10.2.1</version>
        </dependency>

        <!--打印日志框架-->
        <dependency>
            <groupId>org.slf4j</groupId>
            <artifactId>jcl-over-slf4j</artifactId>
            <version>${slf4j.version}</version>
        </dependency>
        <dependency>
            <groupId>org.slf4j</groupId>
            <artifactId>slf4j-api</artifactId>
            <version>${slf4j.version}</version>
        </dependency>
        <dependency>
            <groupId>org.slf4j</groupId>
            <artifactId>slf4j-log4j12</artifactId>
            <version>${slf4j.version}</version>
        </dependency>
        <dependency>
            <groupId>log4j</groupId>
            <artifactId>log4j</artifactId>
            <version>${log4j.version}</version>
        </dependency>
        <!--jackson json 解析框架-->
        <dependency>
            <groupId>com.fasterxml.jackson.core</groupId>
            <artifactId>jackson-core</artifactId>
            <version>2.8.8</version>
        </dependency>
        <dependency>
            <groupId>com.fasterxml.jackson.core</groupId>
            <artifactId>jackson-databind</artifactId>
            <version>2.8.3</version>
        </dependency>

        <!--fastjson json 解析框架-->
        <dependency>
            <groupId>com.alibaba</groupId>
            <artifactId>fastjson</artifactId>
            <version>1.2.24</version>
        </dependency>

        <!--项目公共模块-->
        <dependency>
            <groupId>com.atguigu</groupId>
            <artifactId>app_common</artifactId>
            <version>1.0-SNAPSHOT</version>
        </dependency>

        <!--加载地理信息-->
        <dependency>
            <groupId>com.maxmind.db</groupId>
            <artifactId>maxmind-db</artifactId>
            <version>1.0.0</version>
        </dependency>
    </dependencies>
</project>
```

5.1.2 在 web.xml 文件中加载 Spring 和 Springmvc 配置

```
<?xml version="1.0" encoding="ISO-8859-1"?>

<web-app
        version="3.0"
        xmlns="http://java.sun.com/xml/ns/javaee"
```

```
         xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
         xsi:schemaLocation="http://java.sun.com/xml/ns/javaee
http://java.sun.com/xml/ns/javaee/web-app_3_0.xsd">

    <!--1 spring 加载配置-->
    <listener>

<listener-class>org.springframework.web.context.ContextLoaderListener</listener-class>
    </listener>
    <context-param>
        <param-name>contextConfigLocation</param-name>
        <param-value>classpath:beans.xml</param-value>
    </context-param>

    <!--2 springmvc 加载配置-->
    <servlet>
        <servlet-name>dispatcher</servlet-name>
        <servlet-class>org.springframework.web.servlet.DispatcherServlet</servlet-class>
        <init-param>
            <param-name>contextConfigLocation</param-name>
            <param-value>classpath:dispatcher-servlet.xml</param-value>
        </init-param>
        <load-on-startup>1</load-on-startup>
    </servlet>

    <servlet-mapping>
        <servlet-name>dispatcher</servlet-name>
        <url-pattern>/</url-pattern>
    </servlet-mapping>

    <!--3  解决传输中文乱码-->
    <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>
        <init-param>
            <param-name>forceEncoding</param-name>
            <param-value>true</param-value>
        </init-param>
    </filter>
    <filter-mapping>
        <filter-name>CharacterEncodingFilter</filter-name>
        <url-pattern>/*</url-pattern>
    </filter-mapping>
</web-app>
```

5.1.3 在 resources 路径下添加 Springmvc 配置文件

dispatcher-servlet.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:util="http://www.springframework.org/schema/util"
   xmlns:aop="http://www.springframework.org/schema/aop"
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.xsd
                        http://www.springframework.org/schema/util
http://www.springframework.org/schema/util/spring-util-3.2.xsd
                        http://www.springframework.org/schema/aop
http://www.springframework.org/schema/aop/spring-aop-3.2.xsd
                        http://www.springframework.org/schema/context
http://www.springframework.org/schema/context/spring-context-3.2.xsd
                        http://www.springframework.org/schema/mvc
http://www.springframework.org/schema/mvc/spring-mvc-3.2.xsd">

   <!-- 配置扫描路径 -->
   <context:component-scan
         base-package="com.atguigu.applogs.collect.web.controller"/>
   <!-- 使用注解驱动 -->
   <mvc:annotation-driven/>

   <!-- 内部资源视图解析器 -->
   <bean
class="org.springframework.web.servlet.view.InternalResourceViewResolver">
      <property name="prefix" value="/"/>
      <property name="suffix" value=".jsp"/>
   </bean>

</beans>
```

5.1.4 在 resources 路径下添加 Spring 配置文件

beans.xml

```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:util="http://www.springframework.org/schema/util"
        xmlns:aop="http://www.springframework.org/schema/aop"
        xmlns:p="http://www.springframework.org/schema/p"
        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/util
http://www.springframework.org/schema/util/spring-util.xsd
                                    http://www.springframework.org/schema/aop
http://www.springframework.org/schema/aop/spring-aop.xsd
                                    http://www.springframework.org/schema/context
http://www.springframework.org/schema/context/spring-context.xsd
                                    ">
    <!--配置路径扫描-->
    <context:component-scan base-package="com.atguigu.applogs.collect.web"/>

</beans>
```

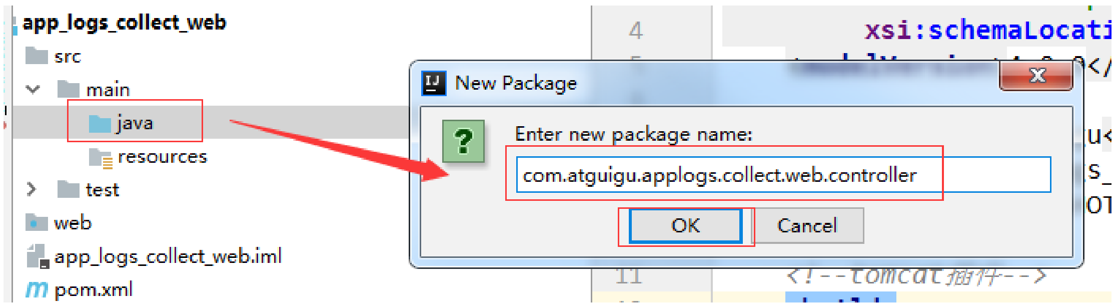
5.1.5 在 resources 路径下添加 log4j 文件

log4j.properties

```
log4j.rootLogger=info, stdout
log4j.appender.stdout=org.apache.log4j.ConsoleAppender
log4j.appender.stdout.layout=org.apache.log4j.PatternLayout
log4j.appender.stdout.layout.ConversionPattern=%d{yyyy-MM-dd HH:mm:ss,SSS}   %5p ---
[%50t]   %-80c(line:%5L)   :   %m%n

log4j.appender.R=org.apache.log4j.RollingFileAppender
log4j.appender.R.File=analysis.log
log4j.appender.R.MaxFileSize=1024KB
log4j.appender.R.MaxBackupIndex=1

log4j.appender.R.layout=org.apache.log4j.PatternLayout
log4j.appender.R.layout.ConversionPattern=%d{yyyy-MM-dd   HH:mm:ss,SSS}      %5p   ---
[%50t]   %-80c(line:%6L)   :   %m%n
```

5.1.6 网络请求处理

1）创建包名：com.atguigu.applogs.collect.web.controller



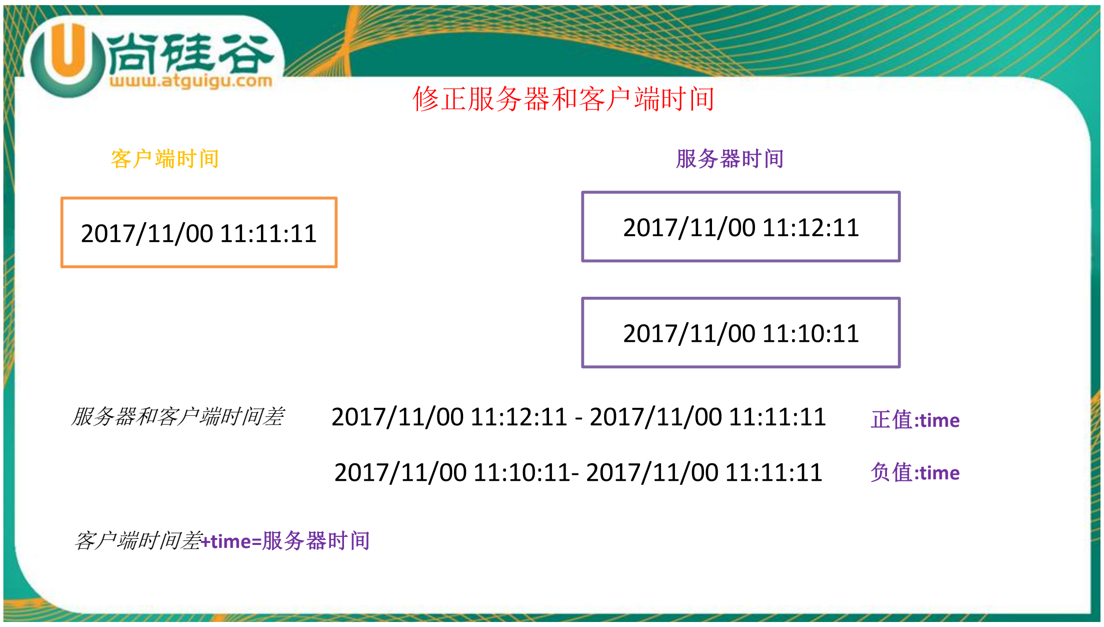
com.atguigu.applogs.collect.web.controller

2）编写代码

```
@Controller
@RequestMapping("/coll")
public class CollectLogController {

    @RequestMapping(value = "/index", method = RequestMethod.POST)
    @ResponseBody
    public AppLogEntity collect(@RequestBody AppLogEntity e, HttpServletRequest req) {

        // 1  修正服务器和客户端时间
        verifyTime(e, req);

        // 2  获取国家、省份和 ip 地址信息
        processIp(e, req);

        // 3  向 Kafka 发送消息
        sendMessage(e);

        return e;
    }
}
```

5.1.7 修正服务器和客户端时间

1）分析



修正服务器和客户端时间

客户端时间

2017/11/00 11:11:11

服务器时间

2017/11/00 11:12:11

2017/11/00 11:10:11

服务器和客户端时间差　2017/11/00 11:12:11 - 2017/11/00 11:11:11　正值:time

2017/11/00 11:10:11- 2017/11/00 11:11:11　负值:time

客户端时间差+time=服务器时间

2）编码实现

```
// 修正时间
private void verifyTime(AppLogEntity e, HttpServletRequest req) {

    // 1 获取服务器时间
    long myTime = System.currentTimeMillis();
    // 2 获取客户端时间
    long clientTime = Long.parseLong(req.getHeader("clientTime"));
    // 3 计算服务器和客户端时间差
    long diff = myTime - clientTime;

    // 4 根据时间差，修正日志中时间
    for (AppStartupLog log : e.getAppStartupLogs()) {
        log.setCreatedAtMs(log.getCreatedAtMs() + diff);
    }

    for (AppUsageLog log : e.getAppUsageLogs()) {
        log.setCreatedAtMs(log.getCreatedAtMs() + diff);
    }

    for (AppPageLog log : e.getAppPageLogs()) {
        log.setCreatedAtMs(log.getCreatedAtMs() + diff);
    }

    for (AppEventLog log : e.getAppEventLogs()) {
        log.setCreatedAtMs(log.getCreatedAtMs() + diff);
    }
```

```
        for (AppErrorLog log : e.getAppErrorLogs()) {
            log.setCreatedAtMs(log.getCreatedAtMs() + diff);
        }
}
```

5.1.8 获取国家、省份、和 IP 地址信息

1）在 resource 路径下添加 GeoLite2-City.mmdb 资源

2）编码实现

根据 ip 地址查询国家和省份信息，并做缓存处理。

```
/**
 *  处理 ip client 地址问题
 * @param e
 */
private void processIp(AppLogEntity e, HttpServletRequest req) {

        // 1  获取客户端 ip 地址
        String clientIP = req.getRemoteAddr();

        // 2  从缓存中获取数据
        GeoInfo geoInfo = cache.get(clientIP);

        //  如果该客户端 ip 地址没有获取过国家和省份信息，则通过工具类获取；
        //  如果该客户端 ip 地址已经获取过国家和省份信息，则直接从缓存对象中获取
        if (geoInfo == null) {
            geoInfo = new GeoInfo();
            geoInfo.setCountry(GeoUtil.getCountry(clientIP));
            geoInfo.setProvince(GeoUtil.getProvince(clientIP));

            //  缓存数据
            cache.put(clientIP, geoInfo);
        }

        // 3  设置国家、省份和客户端 ip 地址信息
        for (AppStartupLog log : e.getAppStartupLogs()) {
            log.setCountry(geoInfo.getCountry());
            log.setProvince(geoInfo.getProvince());
            log.setIpAddress(clientIP);
        }
}
```

```
//  缓存地址信息
```

```
private Map<String, GeoInfo> cache = new HashMap<String, GeoInfo>();
```

5.1.9 向 Kafka 发送消息

1）在 app_common 模块中在 com.atguigu.app.common 包下添加常量（5 个 topic 主题）

```
package com.atguigu.app.common;
/**
  * 常量类
  */
public class Constants {
    //主题
    public static final String TOPIC_APP_STARTUP = "topic_app_startup" ;
    public static final String TOPIC_APP_ERRROR = "topic_app_error" ;
    public static final String TOPIC_APP_EVENT = "topic_app_event" ;
    public static final String TOPIC_APP_USAGE = "topic_app_usage" ;
    public static final String TOPIC_APP_PAGE = "topic_app_page" ;
}
```

2）编写代码（app_logs_collect_web 模块）

```
// 发送消息给发 Kafka
private void sendMessage(AppLogEntity e) {

        // 1  创建配置对象
        Properties props = new Properties();
        // 1.1 Kafka 服务端的主机名和端口号
        props.put("bootstrap.servers", "hadoop102:9092");
        // 1.2  等待所有副本节点的应答
        props.put("acks", "all");
        // 1.3  消息发送最大尝试次数
        props.put("retries", 0);
        // 1.4  一批消息处理大小
        props.put("batch.size", 16384);
        // 1.5  请求延时
        props.put("linger.ms", 1);
        // 1.6  发送缓存区内存大小
        props.put("buffer.memory", 33554432);
        // 1.7 key 序列化
        props.put("key.serializer",
"org.apache.kafka.common.serialization.StringSerializer");
        // 1.8 value 序列化
        props.put("value.serializer",
"org.apache.kafka.common.serialization.StringSerializer");
```

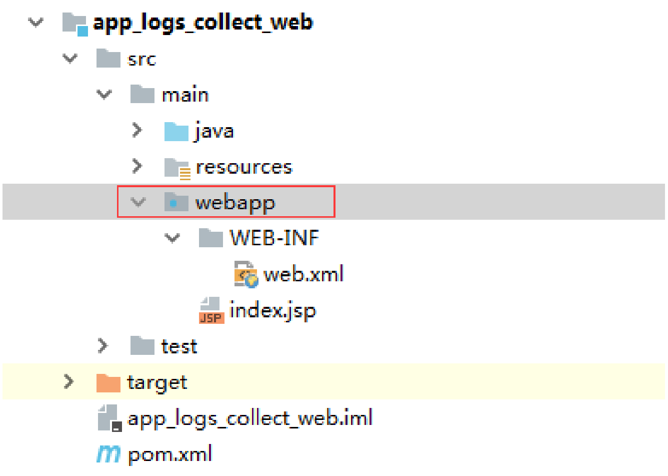
```
        // 2  创建生产者
        KafkaProducer<String, String> producer = new KafkaProducer<String, String>(props);

        // 3  根据日志类型分别向 5 个主题发送消息
        sendSingleLog(producer, Constants.TOPIC_APP_STARTUP, e.getAppStartupLogs());
        sendSingleLog(producer, Constants.TOPIC_APP_ERRROR, e.getAppErrorLogs());
        sendSingleLog(producer, Constants.TOPIC_APP_EVENT, e.getAppEventLogs());
        sendSingleLog(producer, Constants.TOPIC_APP_PAGE, e.getAppPageLogs());
        sendSingleLog(producer, Constants.TOPIC_APP_USAGE, e.getAppUsageLogs());

        // 4  关闭生产者
        producer.close();
}
```

```
/**
  *  发送单个的 log 消息给 kafka
  */
private void sendSingleLog(KafkaProducer<String, String> producer, String topic, AppBaseLog[] logs) {

        for (AppBaseLog log : logs) {

                // 1  将 bean 对象转换为 json
                String logMsg = JSONObject.toJSONString(log);

                // 2  创建待发送消息对象
                ProducerRecord<String, String> data = new ProducerRecord<String, String>(topic, logMsg);

                // 3  发送消息
                producer.send(data);
        }
}
```

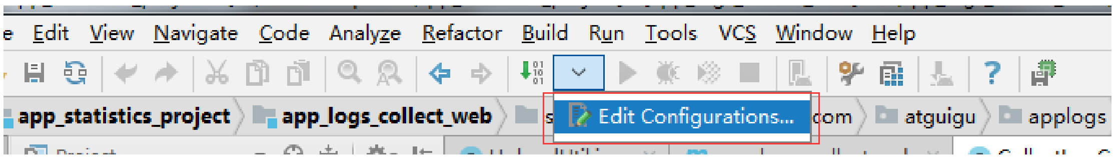
5.1.10 IDEA 上执行 Web 程序

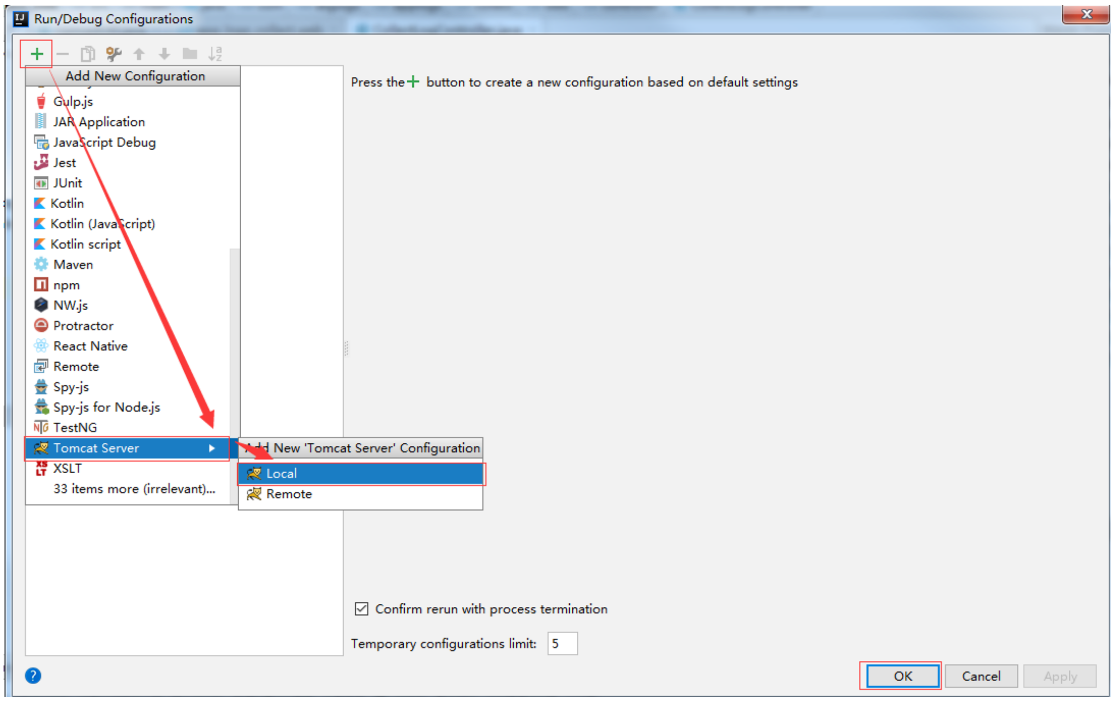
1）调整 web 项目结构

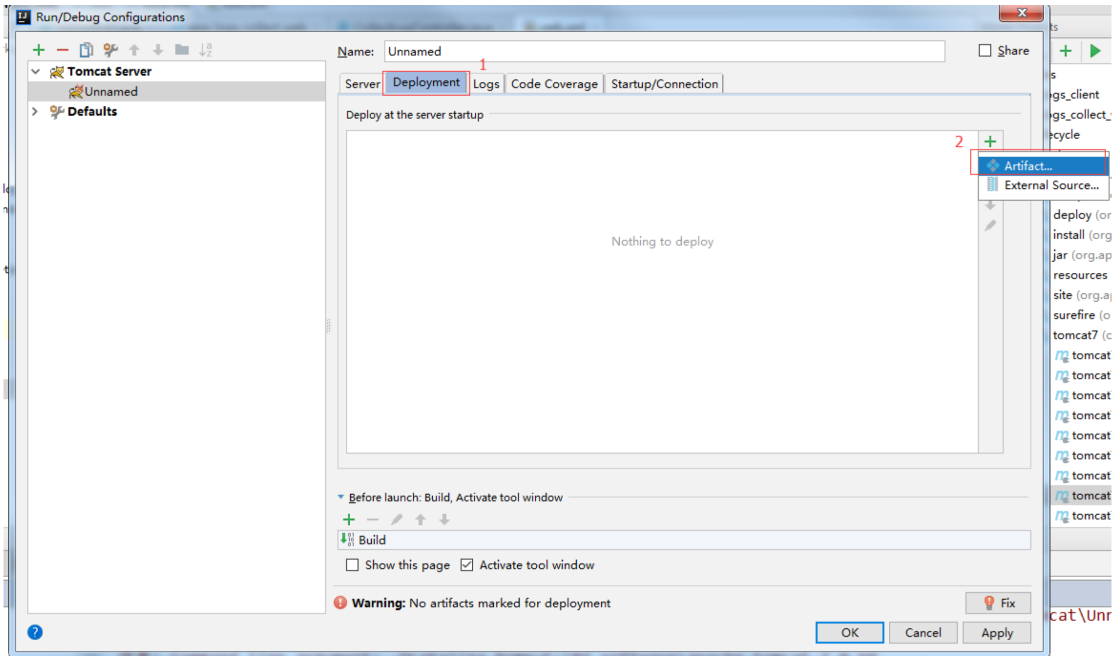
（1）将 web 文件夹整体拖拽到 main 文件夹下，并修改名称为 webapp

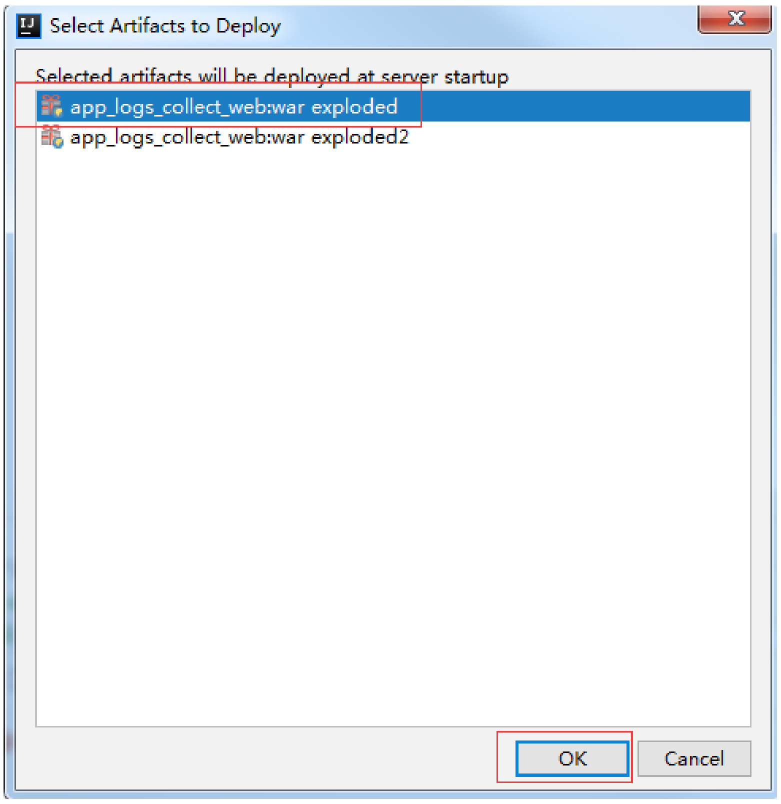


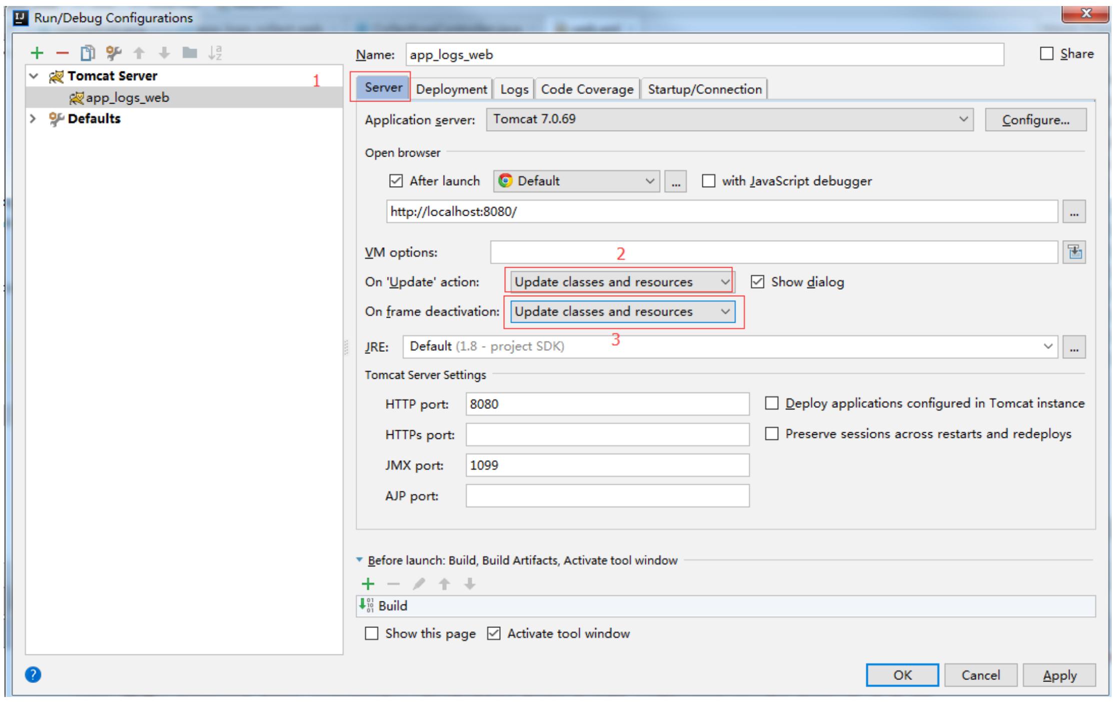
2）配置 web 执行程序方式






Run/Debug Configurations
Tomcat Server
Unnamed
Defaults
Name: Unnamed
Share
Server
Deployment
1
Logs
Code Coverage
Startup/Connection
Deploy at the server startup
2
Artifact...
External Source...
Nothing to deploy
Before launch: Build, Activate tool window
Build
Show this page
Activate tool window
Warning: No artifacts marked for deployment
Fix
OK
Cancel
Apply


Select Artifacts to Deploy
Selected artifacts will be deployed at server startup
app_logs_collect_web:war exploded
app_logs_collect_web:war exploded2
OK
Cancel



Name: app_logs_web ☐ Share

Application server: Tomcat 7.0.69

Open browser

☑ After launch Default ☐ with JavaScript debugger

http://localhost:8080/

VM options:

On 'Update' action: Update classes and resources ☑ Show dialog

On frame deactivation: Update classes and resources

JRE: Default (1.8 - project SDK)

Tomcat Server Settings

HTTP port: 8080 ☐ Deploy applications configured in Tomcat instance

HTTPs port: ☐ Preserve sessions across restarts and redeploys

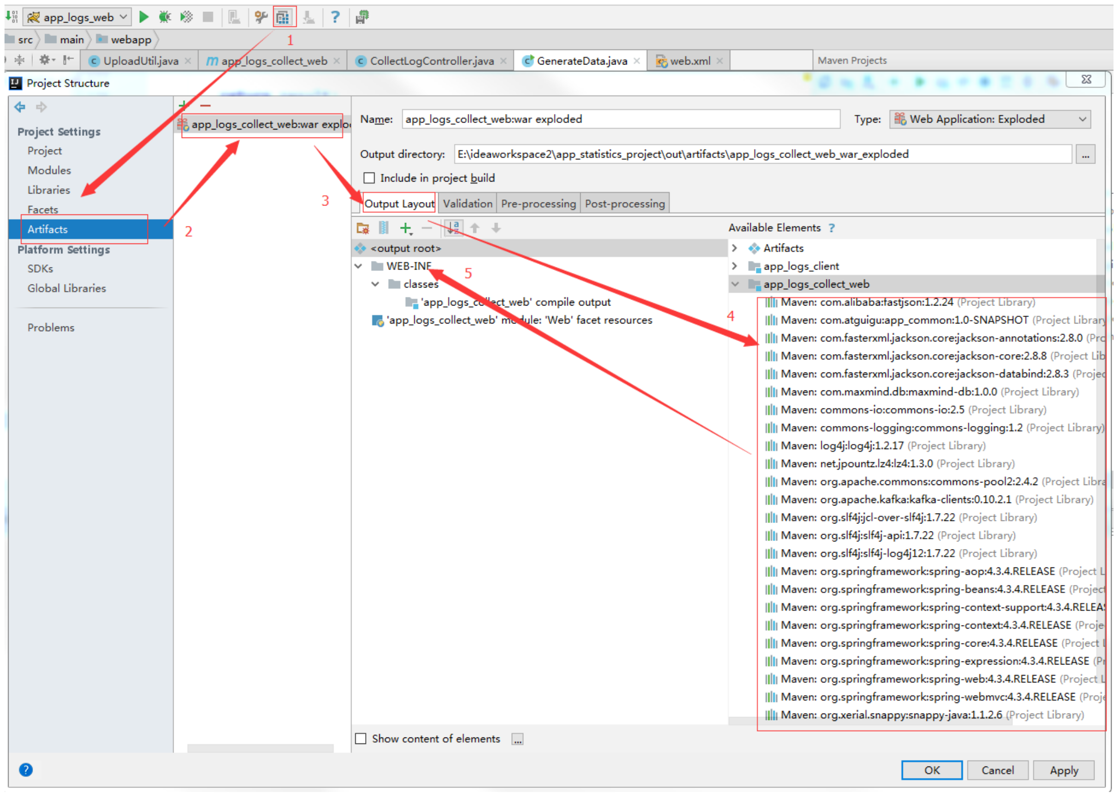
JMX port: 1099

AJP port:

Before launch: Build, Build Artifacts, Activate tool window

☐ Show this page ☑ Activate tool window

3）向 web 工程中添加 jar 包依赖



app_logs_collect_web:war exploded

Name: app_logs_collect_web:war exploded Type: Web Application: Exploded

Output directory: E:\ideaworkspace2\app_statistics_project\out\artifacts\app_logs_collect_web_war_exploded

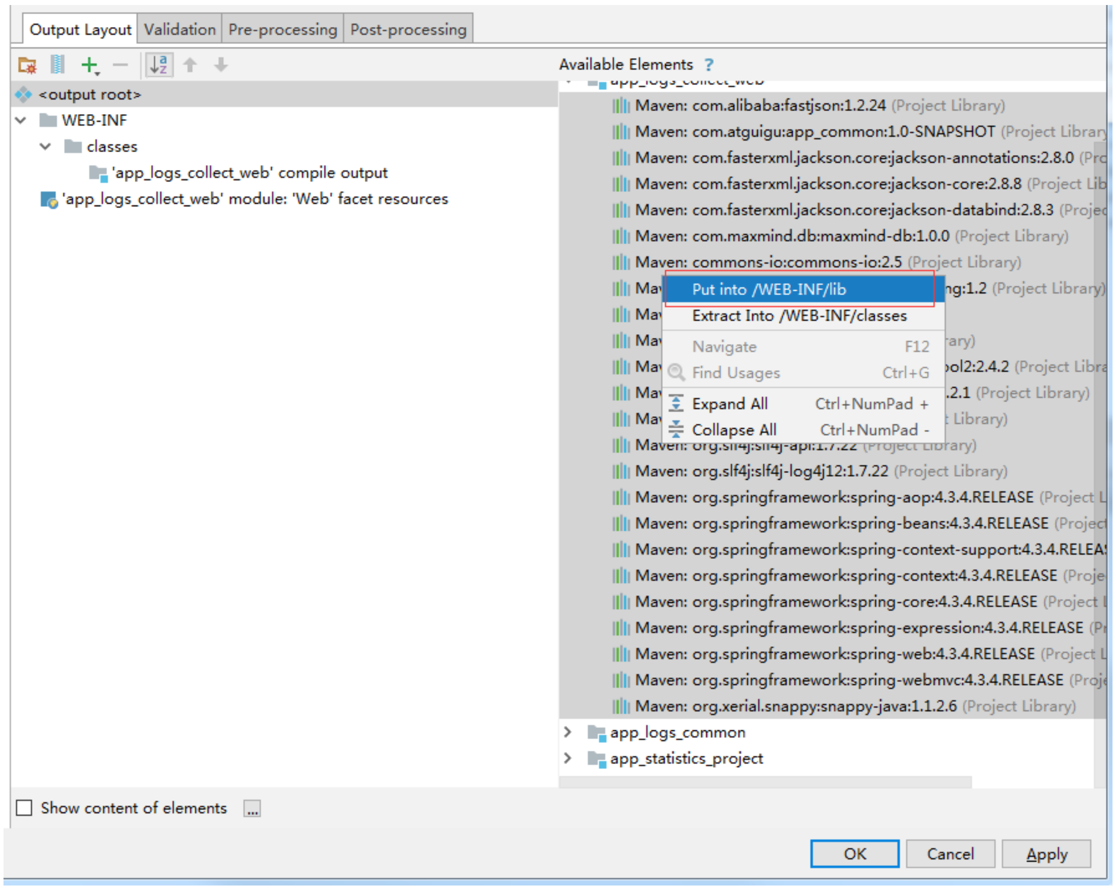
☐ Include in project build

```
<output root>
  WEB-INF
    classes
      'app_logs_collect_web' compile output
  'app_logs_collect_web' module: 'Web' facet resources
```

Available Elements

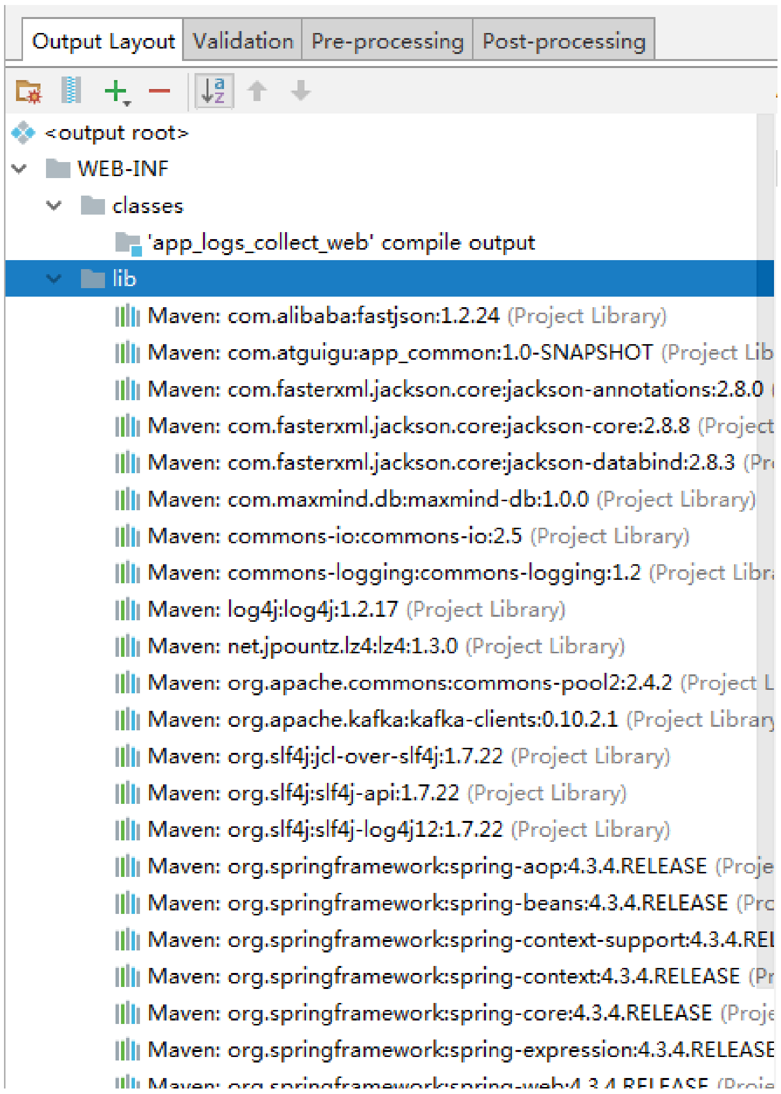
```
Artifacts
app_logs_client
app_logs_collect_web
  Maven: com.alibaba:fastjson:1.2.24 (Project Library)
  Maven: com.atguigu:app_common:1.0-SNAPSHOT (Project Library)
  Maven: com.fasterxml.jackson.core:jackson-annotations:2.8.0 (Pro
  Maven: com.fasterxml.jackson.core:jackson-core:2.8.8 (Project Lib
  Maven: com.fasterxml.jackson.core:jackson-databind:2.8.3 (Projec
  Maven: com.maxmind.db:maxmind-db:1.0.0 (Project Library)
  Maven: commons-io:commons-io:2.5 (Project Library)
  Maven: commons-logging:commons-logging:1.2 (Project Library)
  Maven: log4j:log4j:1.2.17 (Project Library)
  Maven: net.jpountz.lz4:lz4:1.3.0 (Project Library)
  Maven: org.apache.commons:commons-pool2:2.4.2 (Project Libra
  Maven: org.apache.kafka:kafka-clients:0.10.2.1 (Project Library)
  Maven: org.slf4j:jcl-over-slf4j:1.7.22 (Project Library)
  Maven: org.slf4j:slf4j-api:1.7.22 (Project Library)
  Maven: org.slf4j:slf4j-log4j12:1.7.22 (Project Library)
  Maven: org.springframework:spring-aop:4.3.4.RELEASE (Project L
  Maven: org.springframework:spring-beans:4.3.4.RELEASE (Projec
  Maven: org.springframework:spring-context-support:4.3.4.RELEAS
  Maven: org.springframework:spring-context:4.3.4.RELEASE (Proje
  Maven: org.springframework:spring-core:4.3.4.RELEASE (Project L
  Maven: org.springframework:spring-expression:4.3.4.RELEASE (Pr
  Maven: org.springframework:spring-web:4.3.4.RELEASE (Project L
  Maven: org.springframework:spring-webmvc:4.3.4.RELEASE (Proj
  Maven: org.xerial.snappy:snappy-java:1.1.2.6 (Project Library)
```

☐ Show content of elements



```
<output root>
WEB-INF
  classes
    'app_logs_collect_web' compile output
  'app_logs_collect_web' module: 'Web' facet resources
```

```
app_logs_collect_web
  Maven: com.alibaba:fastjson:1.2.24 (Project Library)
  Maven: com.atguigu:app_common:1.0-SNAPSHOT (Project Library)
  Maven: com.fasterxml.jackson.core:jackson-annotations:2.8.0 (Pro
  Maven: com.fasterxml.jackson.core:jackson-core:2.8.8 (Project Lib
  Maven: com.fasterxml.jackson.core:jackson-databind:2.8.3 (Projec
  Maven: com.maxmind.db:maxmind-db:1.0.0 (Project Library)
  Maven: commons-io:commons-io:2.5 (Project Library)
  Ma                        ng:1.2 (Project Library)
  Ma
  Ma                        ary)
  Ma                        ool2:2.4.2 (Project Libra
  Ma                        .2.1 (Project Library)
  Ma                        Library)
  Maven: org.slf4j:slf4j-api:1.7.22 (Project Library)
  Maven: org.slf4j:slf4j-log4j12:1.7.22 (Project Library)
  Maven: org.springframework:spring-aop:4.3.4.RELEASE (Project L
  Maven: org.springframework:spring-beans:4.3.4.RELEASE (Project
  Maven: org.springframework:spring-context-support:4.3.4.RELEA
  Maven: org.springframework:spring-context:4.3.4.RELEASE (Proje
  Maven: org.springframework:spring-core:4.3.4.RELEASE (Project L
  Maven: org.springframework:spring-expression:4.3.4.RELEASE (Pr
  Maven: org.springframework:spring-web:4.3.4.RELEASE (Project L
  Maven: org.springframework:spring-webmvc:4.3.4.RELEASE (Proje
  Maven: org.xerial.snappy:snappy-java:1.1.2.6 (Project Library)
> app_logs_common
> app_statistics_project
```


Output Layout | Validation | Pre-processing | Post-processing

```
<output root>
WEB-INF
  classes
    'app_logs_collect_web' compile output
  lib
    Maven: com.alibaba:fastjson:1.2.24 (Project Library)
    Maven: com.atguigu:app_common:1.0-SNAPSHOT (Project Lib
    Maven: com.fasterxml.jackson.core:jackson-annotations:2.8.0 (
    Maven: com.fasterxml.jackson.core:jackson-core:2.8.8 (Project
    Maven: com.fasterxml.jackson.core:jackson-databind:2.8.3 (Pr
    Maven: com.maxmind.db:maxmind-db:1.0.0 (Project Library)
    Maven: commons-io:commons-io:2.5 (Project Library)
    Maven: commons-logging:commons-logging:1.2 (Project Libr
    Maven: log4j:log4j:1.2.17 (Project Library)
    Maven: net.jpountz.lz4:lz4:1.3.0 (Project Library)
    Maven: org.apache.commons:commons-pool2:2.4.2 (Project L
    Maven: org.apache.kafka:kafka-clients:0.10.2.1 (Project Library
    Maven: org.slf4j:jcl-over-slf4j:1.7.22 (Project Library)
    Maven: org.slf4j:slf4j-api:1.7.22 (Project Library)
    Maven: org.slf4j:slf4j-log4j12:1.7.22 (Project Library)
    Maven: org.springframework:spring-aop:4.3.4.RELEASE (Proje
    Maven: org.springframework:spring-beans:4.3.4.RELEASE (Pro
    Maven: org.springframework:spring-context-support:4.3.4.REL
    Maven: org.springframework:spring-context:4.3.4.RELEASE (Pr
    Maven: org.springframework:spring-core:4.3.4.RELEASE (Proje
    Maven: org.springframework:spring-expression:4.3.4.RELEASE
    Maven: org.springframework:spring-web:4.3.4.RELEASE (Proje
```

5.1.11 测试

1）启动 tomact

2）启动日志生成程序，查看是否正确收到数据响应码 200。

5.2 Kafka 集群模块

5.2.1 配置 Zookeeper 集群

1）具体配置详见：尚硅谷大数据技术之 Zookeeper.doc 文档

2）启动 zookeeper

```
[atguigu@hadoop102 zookeeper-3.4.10]$ bin/zkServer.sh start
[atguigu@hadoop103 zookeeper-3.4.10]$ bin/zkServer.sh start
[atguigu@hadoop104 zookeeper-3.4.10]$ bin/zkServer.sh start
```

5.2.2 配置 Kafka 集群

0）配置 kafka 集群，详见：尚硅谷大数据技术之 Kafka.doc

1）启动 kafka

```
[atguigu@hadoop102 kafka]$ bin/kafka-server-start.sh config/server.properties &
[atguigu@hadoop103 kafka]$ bin/kafka-server-start.sh config/server.properties &
[atguigu@hadoop104 kafka]$ bin/kafka-server-start.sh config/server.properties &
```

2）查看主题

```
[atguigu@hadoop102 kafka]$ bin/kafka-topics.sh --zookeeper hadoop102:2181 --list
```

3）创建 kafka 的 topic

```
[atguigu@hadoop102 kafka]$ bin/kafka-topics.sh --create --zookeeper hadoop102:2181
--create --replication-factor 3 --partitions 1 --topic topic_app_startup;
[atguigu@hadoop102 kafka]$ bin/kafka-topics.sh --create --zookeeper hadoop102:2181
--create --replication-factor 3 --partitions 1 --topic topic_app_error;
[atguigu@hadoop102 kafka]$ bin/kafka-topics.sh --create --zookeeper hadoop102:2181
--create --replication-factor 3 --partitions 1 --topic topic_app_event;
[atguigu@hadoop102 kafka]$ bin/kafka-topics.sh --create --zookeeper hadoop102:2181
--create --replication-factor 3 --partitions 1 --topic topic_app_usage;
[atguigu@hadoop102 kafka]$ bin/kafka-topics.sh --create --zookeeper hadoop102:2181
--create --replication-factor 3 --partitions 1 --topic topic_app_page;
```

5.2.3 测试

1）创建消费者主题（主要用于测试数据是否能够接收到）

```
[atguigu@hadoop102 kafka]$ bin/kafka-console-consumer.sh --zookeeper hadoop102:2181
--topic topic_app_startup;
```

2）启动日志生成程序。

3）观察 kafka 消费者是否正常消费到消息。

5.2.4 Centos 上部署 Tomcat

1）在 linux 上安装 Tomcat

（1）将 apache-tomcat-7.0.72.tar.gz 导入到 linux 的/opt/software 路径下

（2）解压 apache-tomcat-7.0.72.tar.gz 到/opt/module/路径下

```
[atguigu@hadoop102 software]$ tar -zxvf apache-tomcat-7.0.72.tar.gz -C /opt/module/
```

（3）修改名称为 tomcat

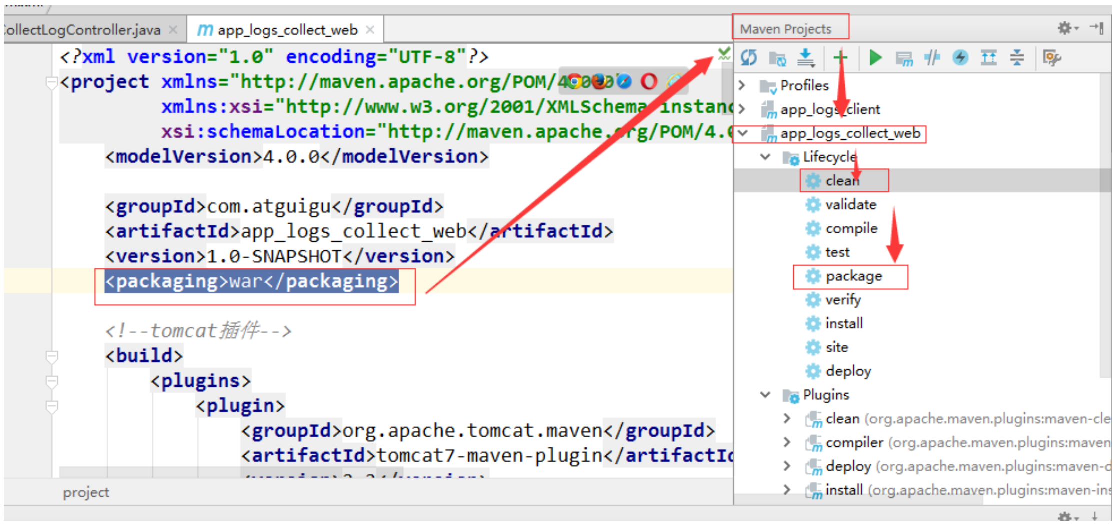
```
[atguigu@hadoop102 module]$ mv apache-tomcat-7.0.72 tomcat
```

2）部署 Web 程序到 Tomcat

（1）将 web 工程打成 war 包，名称为 app_logs.war

a)检查 pom 文件中是否添加，<**packaging**>war</**packaging**>

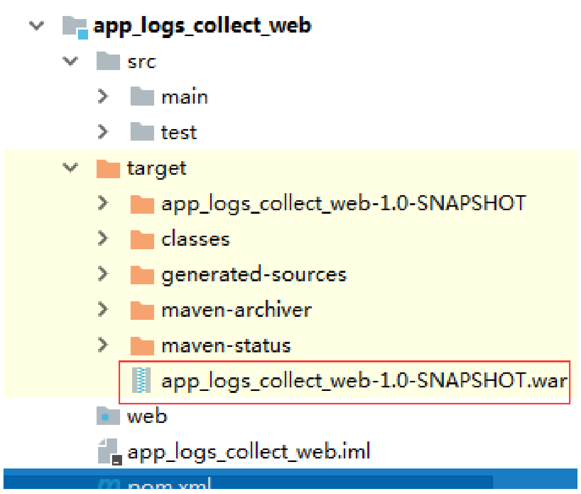
b)在 maven project 中找到 app_logs_collect_web 工程，点击 clean,然后点击 package。生成 war 包。

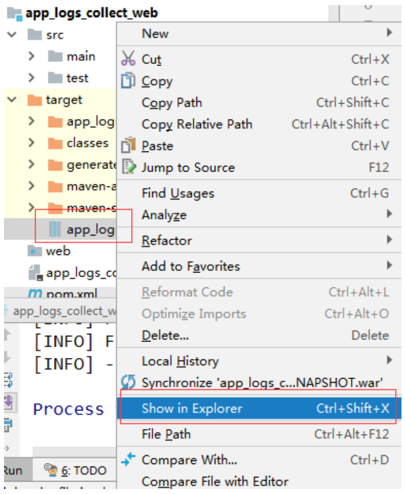


```
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0"
         xmlns:xsi="http://www.w3.org/2001/XMLSchema-instanc
         xsi:schemaLocation="http://maven.apache.org/POM/4.(
    <modelVersion>4.0.0</modelVersion>

    <groupId>com.atguigu</groupId>
    <artifactId>app_logs_collect_web</artifactId>
    <version>1.0-SNAPSHOT</version>
    <packaging>war</packaging>

    <!--tomcat插件-->
    <build>
        <plugins>
            <plugin>
                <groupId>org.apache.tomcat.maven</groupId>
                <artifactId>tomcat7-maven-plugin</artifactI
```

CollectLogController.java
app_logs_collect_web
project
Maven Projects
Profiles
app_logs_client
app_logs_collect_web
Lifecycle
clean
validate
compile
test
package
verify
install
site
deploy
Plugins
clean (org.apache.maven.plugins:maven-cle
compiler (org.apache.maven.plugins:maven
deploy (org.apache.maven.plugins:maven-c
install (org.apache.maven.plugins:maven-ins

c)查找到 war 包，并修改名称为 app_logs。





修改 app_logs_collect_web-1.0-SNAPSHOT.war 的名称为 app_logs.war

（2）将 app_logs.war 导入到 linux 的/opt/module/tomcat/webapps 路径下

（3）启动 Tomcat

```
[atguigu@hadoop102 bin]$ pwd
/opt/module/tomcat/bin
[atguigu@hadoop102 bin]$ ./startup.sh
```

5.2.5 测试

修改 app_logs_client 工程中的 UploadUtil 中的请求地址为

```
URL url = new URL("http://hadoop102:8080/app_logs/coll/index");// 生产地址
```

执行日志生成程序，观察能否正确收到响应码 200，否则需要进一步调试。

5.3 Flume 模块

5.3.1 配置 Hadoop 集群

1）配置 Hadoop 集群，详见：尚硅谷大数据技术之 Hadoop（入门）.doc 文档

2）启动 hadoop 集群

```
[atguigu@hadoop102 hadoop-2.7.2]$ sbin/start-dfs.sh
[atguigu@hadoop103 hadoop-2.7.2]$ sbin/start-yarn.sh
```

5.3.2 Flume 安装

1）将 apache-flume-1.7.0-bin.tar.gz 导入到 Linux 系统中/opt/sotfware 目录下

2）解压 apache-flume-1.7.0-bin.tar.gz 到/opt/module 目录下

```
[atguigu@hadoop102 software]$ tar -zxvf apache-flume-1.7.0-bin.tar.gz -C /opt/module/
```

3）修改 apache-flume-1.7.0-bin 名称为 flume

```
[atguigu@hadoop102 module]$ mv apache-flume-1.7.0-bin/ flume
```

4）配置 flume 环境变量

```
[root@hadoop102 flume]# vi /etc/profile
#FLUME_HOME
export FLUME_HOME=/opt/module/flume
export PATH=$PATH:$FLUME_HOME/bin
[root@hadoop102 flume]# source /etc/profile
```

5）验证 Flume 环境变量配置

```
[root@hadoop102 flume]# flume-ng version
```

Flume 1.7.0

5.3.3 创建 Flume 拦截器

1）创建拦截器主要目的是区分 kafka 传递过来的日志类型。

2）自定义拦截器实操

（1）创建 Java 工程 app_logs_flume

（2）添加 maven 支持，并导入 pom 文件，并刷新一下 maven

```
<?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.atguigu</groupId>
    <artifactId>app_logs_flume</artifactId>
    <version>1.0-SNAPSHOT</version>

    <dependencies>
        <dependency>
            <groupId>org.apache.flume</groupId>
            <artifactId>flume-ng-core</artifactId>
            <version>1.7.0</version>
        </dependency>
    </dependencies>
</project>
```

（2）代码实现

a)创建包名：com.atguigu.app.flume.interceptor

b)根据系统时间拦截器自定义拦截器：Ctrl+shift+t，输入 TimestampInterceptor，将系统时间拦截器中代码拷贝过来，替换 TimestampInterceptor 的名称为 LogCollInterceptor。

c)编写连接器业务代码

```
package com.atguigu.app.flume.interceptor;
import org.apache.flume.Context;
import org.apache.flume.Event;
import org.apache.flume.interceptor.Interceptor;
import java.util.List;
import java.util.Map;
import static org.apache.flume.interceptor.TimestampInterceptor.Constants.*;
```

```
/**
 * 自定义 flume 的拦截器,提取 body 中的日志类型作为 header
 */
public class LogCollInterceptor implements Interceptor {

	private final boolean preserveExisting;

	private LogCollInterceptor(boolean preserveExisting) {
		this.preserveExisting = preserveExisting;
	}

	public void initialize() {

	}

	/**
	 * Modifies events in-place.
	 */
	public Event intercept(Event event) {
		// 1 获取 flume 接收消息头
		Map<String, String> headers = event.getHeaders();

		// 2 获取 flume 接收的 json 数据数组
		byte[] json = event.getBody();
		//  将 json 数组转换为字符串
		String jsonStr = new String(json);

		// pageLog
		String logType = "" ;
		if(jsonStr.contains("pageId")){
			logType = "page" ;
		}
		// eventLog
		else if (jsonStr.contains("eventId")) {
			logType = "event";
		}
		// usageLog
		else if (jsonStr.contains("singleUseDurationSecs")) {
			logType = "usage";
		}
		// error
		else if (jsonStr.contains("errorBrief")) {
			logType = "error";
		}
		// startup
		else if (jsonStr.contains("network")) {
			logType = "startup";
		}

		// 3 将日志类型存储到 flume 头中
		headers.put("logType", logType);

		return event;
	}

	/**
	 * Delegates to {@link #intercept(Event)} in a loop.
	 * @param events
	 * @return
	 */
	public List<Event> intercept(List<Event> events) {
		for (Event event : events) {
			intercept(event);
		}
		return events;
	}

	public void close() {
	}

	public static class Builder implements Interceptor.Builder {

		private boolean preserveExisting = PRESERVE_DFLT;

		public Interceptor build() {
			return new LogCollInterceptor(preserveExisting);
		}

		public void configure(Context context) {
			preserveExisting = context.getBoolean(PRESERVE, PRESERVE_DFLT);
		}
	}

	public static class Constants {
		public static String TIMESTAMP = "timestamp";
		public static String PRESERVE = "preserveExisting";
```

```
            public static boolean PRESERVE_DFLT = false;
        }
}
```

（3）打成 jar 包，修改 jar 包名称为 app_logs_flume.jar，然后将该 jar 包导入 linux 虚拟机/opt/module/flume/lib 目录下。

5.3.4 配置 Flume

1）配置需求：实现消费 kafka 的 5 个主题，并把数据导入到 HDFS 文件系统。

2）配置实现：

```
[atguigu@hadoop102 conf]$ pwd
/opt/module/flume/conf
[atguigu@hadoop102 conf]$ cp flume-conf.properties.template flume-conf.properties
[atguigu@hadoop102 conf]$ vi flume-conf.properties
```

打开文件的末尾追加以下内容

```
a1.sources=r1
a1.channels=c1
a1.sinks=k1

a1.sources.r1.interceptors = i1
a1.sources.r1.interceptors.i1.type =
com.atguigu.app.flume.interceptor.LogCollInterceptor$Builder
a1.sources.r1.type = org.apache.flume.source.kafka.KafkaSource
a1.sources.r1.batchSize = 5000
a1.sources.r1.batchDurationMillis = 2000
a1.sources.r1.kafka.bootstrap.servers = hadoop102:9092
a1.sources.r1.kafka.zookeeperConnect = hadoop102:2181,hadoop103:2181,hadoop104:2181
a1.sources.r1.kafka.topics=topic_app_startup,topic_app_error,topic_app_event,topic_app_usag
e,topic_app_page

a1.channels.c1.type=memory
a1.channels.c1.capacity=100000
a1.channels.c1.transactionCapacity=10000

a1.sinks.k1.type = hdfs
a1.sinks.k1.hdfs.path = /user/centos/applogs/%{logType}/%Y%m/%d/%H%M
a1.sinks.k1.hdfs.filePrefix = events-
a1.sinks.k1.hdfs.round = true
a1.sinks.k1.hdfs.roundValue = 30
a1.sinks.k1.hdfs.roundUnit = second
```

```

#不要产生大量小文件
a1.sinks.k1.hdfs.rollInterval = 30
a1.sinks.k1.hdfs.rollSize = 0
a1.sinks.k1.hdfs.rollCount = 0
#控制输出文件是原生文件。
a1.sinks.k1.hdfs.fileType = DataStream

a1.sources.r1.channels = c1
a1.sinks.k1.channel= c1
```

2）启动 flume

```
[atguigu@hadoop102 conf]$ pwd
/opt/module/flume/conf
[atguigu@hadoop102 conf]$ flume-ng agent -f flume-conf.properties -n a1
```

5.3.5 测试

1）启动日志生成程序

2）查看 HDFS 的/user/centos/applogs 路径上是否有数据收到。

六 数据处理模块框架搭建

6.1 数据处理模块集群部署规划

Hadoop102 主机	Hadoop103 主机	Hadoop104 主机
	Hive1.2.1	
Mysql 5.6.24		

6.2 配置 Hive 元数据存储到 mysql

具体安装配置，详见：尚硅谷大数据技术之 Hive.doc 文档

6.3 配置 Hive 支持 JSON 存储

在 Hive 中采用 Json 作为存储格式，需要建表时指定 Serde。Insert into 时，Hive 使用 json 格式进行保存，查询时，通过 json 库进行解析。Hive 默认输出是压缩格式，这里改成不压缩。

1）实操

（1）将 json-serde-1.3.8-jar-with-dependencies.jar 导入到 hive 的/opt/module/hive/lib 路径下。

（2）在/opt/module/hive/conf/hive-site.xml 文件中添加如下配置

```
<property>
	<name>hive.aux.jars.path</name>
	<value>file:///opt/module/hive/lib/json-serde-1.3.8-jar-with-dependencies.jar</value>
</property>

<property>
	<name>hive.exec.compress.output</name>
	<value>false</value>
</property>
```

6.4 创建数据库及分区表

0）启动 hive

```
[atguigu@hadoop103 hive]$ bin/hive
```

查看数据库

```
hive (default)> show databases;
```

如果 applogs_db 存在则删除数据库

```
hive (default)> drop database applogs_db;
```

1）创建数据库

```
hive (default)> create database applogsdb ;
```

使用 applogsdb 数据库

```
hive (default)> use applogsdb;
```

2）创建分区表

```
--startup
CREATE external TABLE ext_startup_logs(createdAtMs bigint,appId string,tenantId string,deviceId string,appVersion string,appChannel string,appPlatform string,osType string,deviceStyle string,country string,province string,ipAddress string,network string,carrier string,brand string,screenSize string)PARTITIONED BY (ym string, day string,hm string) ROW FORMAT SERDE 'org.openx.data.jsonserde.JsonSerDe' STORED AS TEXTFILE;

--error
CREATE external TABLE ext_error_logs(createdAtMs bigint,appId string,tenantId string,deviceId string,appVersion string,appChannel string,appPlatform string,osType string,deviceStyle string,errorBrief string,errorDetail string)PARTITIONED BY (ym string, day string,hm string) ROW FORMAT SERDE 'org.openx.data.jsonserde.JsonSerDe' STORED AS TEXTFILE;
```

```
--event
CREATE external TABLE ext_event_logs(createdAtMs bigint,appId string,tenantId string,deviceId string,appVersion string,appChannel string,appPlatform string,osType string,deviceStyle string,eventId string,eventDurationSecs bigint,paramKeyValueMap Map<string,string>)PARTITIONED BY (ym string, day string,hm string) ROW FORMAT SERDE 'org.openx.data.jsonserde.JsonSerDe' STORED AS TEXTFILE;

--page
CREATE external TABLE ext_page_logs(createdAtMs bigint,appId string,tenantId string,deviceId string,appVersion string,appChannel string,appPlatform string,osType string,deviceStyle string,pageViewCntInSession int,pageId string,visitIndex int,nextPage string,stayDurationSecs bigint)PARTITIONED BY (ym string, day string,hm string) ROW FORMAT SERDE 'org.openx.data.jsonserde.JsonSerDe' STORED AS TEXTFILE;

--usage
CREATE external TABLE ext_usage_logs(createdAtMs bigint,appId string,tenantId string,deviceId string,appVersion string,appChannel string,appPlatform string,osType string,deviceStyle string,singleUseDurationSecs bigint,singleUploadTraffic bigint,singleDownloadTraffic bigint)PARTITIONED BY (ym string, day string,hm string) ROW FORMAT SERDE 'org.openx.data.jsonserde.JsonSerDe' STORED AS TEXTFILE;
```

3）查看数据库中的分区表

```
hive (applogsdb)> show tables;
    tab_name
    ext_error_logs
    ext_event_logs
    ext_page_logs
    ext_startup_logs
    ext_usage_logs
```

4）退出 hive

```
hive (applogsdb)> quit;
```

6.5 编写 Hive 执行脚本

0）需求：实现每隔一分钟将 HDFS 上的数据，导入到 Hive 对应分区中一次。

1）Date 命令

（1）明天

```
[atguigu@hadoop103 shell]$ date -d "1 day" +%Y%m%d
20171107
```

（2）昨天

```
[atguigu@hadoop103 shell]$ date -d "-1 day" +%Y%m%d
20171105
```

（3）上一个月

```
[atguigu@hadoop103 shell]$ date -d "-1 month" +%Y%m%d
20171006
```

（4）前三分钟

```
[atguigu@hadoop103 shell]$ date -d "-3 minute" +%Y%m-%d-%H%M
201711-06-1130
```

（5）用“-”分割，截取出第一个参数

```
[atguigu@hadoop103 shell]$ date -d "-3 minute" +%Y%m-%d-%H%M | awk -F '-' '{print $1}'
201711
```

（6）用“-”分割，截取出第二个参数

```
[atguigu@hadoop103 shell]$ date -d "-3 minute" +%Y%m-%d-%H%M | awk -F '-' '{print $2}'
06
```

（7）用“-”分割，截取出第三个参数

```
[atguigu@hadoop103 shell]$ date -d "-3 minute" +%Y%m-%d-%H%M | awk -F '-' '{print $3}'
1131
```

2）在/opt/module/shell 目录下编写 shell 脚本（hdfstohive.sh）

（1）创建文件夹：

```
[atguigu@hadoop103 module]$ mkdir shell
```

（2）创建脚本 hdfstohive.sh

```
[atguigu@hadoop103 shell]$ touch hdfstohive.sh
```

```
#!/bin/bash
systime=`date -d "-3 minute" +%Y%m-%d-%H%M`
ym=`echo ${systime} | awk -F '-' '{print $1}'`
day=`echo ${systime} | awk -F '-' '{print $2}'`
hm=`echo ${systime} | awk -F '-' '{print $3}'`
```

```
#执行 hive 的命令

hive -e "load data inpath '/user/centos/applogs/startup/${ym}/${day}/${hm}' into table applogsdb.ext_startup_logs partition(ym='${ym}',day='${day}',hm='${hm}')"
hive -e "load data inpath '/user/centos/applogs/error/${ym}/${day}/${hm}' into table applogsdb.ext_error_logs partition(ym='${ym}',day='${day}',hm='${hm}')"
hive -e "load data inpath '/user/centos/applogs/event/${ym}/${day}/${hm}' into table applogsdb.ext_event_logs partition(ym='${ym}',day='${day}',hm='${hm}')"
hive -e "load data inpath '/user/centos/applogs/usage/${ym}/${day}/${hm}' into table applogsdb.ext_usage_logs partition(ym='${ym}',day='${day}',hm='${hm}')"
hive -e "load data inpath '/user/centos/applogs/page/${ym}/${day}/${hm}' into table applogsdb.ext_page_logs partition(ym='${ym}',day='${day}',hm='${hm}')"
```

（3）修改脚本 hdfstohive.sh 权限

```
[atguigu@hadoop103 shell]$ chmod 777 hdfstohive.sh
```

（4）必须保证 hive 的环境变量已经配置

```
[root@hadoop103 shell]# vi /etc/profile
    #HIVE_HOME
    export HIVE_HOME=/opt/module/hive
    export PATH=$PATH:$HIVE_HOME/bin
[root@hadoop103 shell]# source /etc/profile
```

（5）执行一下 hive 脚本

```
[atguigu@hadoop103 shell]$ ./hdfstohive.sh
```

6.6 编写 Linux 调度 crondtab

1）crontab 常用命令

（1）查看状态：

```
service crond status
```

（2）停止状态：

```
service crond stop
```

（3）启动状态：

```
service crond start
```

（4）编辑 crontab 定时任务

```
crontab -e
```

（5）查询 crontab 任务

```
crontab -l
```

（6）删除当前用户所有的 crontab 任务

```
crontab -r
```

2）编写 crontab 调度

1）进入编写 crontab 调度

```
[atguigu@hadoop103 shell]$ crontab -e
```

2）实现每分钟执行一次

```
* * * * * source /etc/profile; /opt/module/shell/hdfstohive.sh
```

项目	含义	范围
第一个 “*”	一小时当中的第几分钟	0-59
第二个 “*”	一天当中的第几小时	0-23
第三个 “*”	一个月当中的第几天	1-31
第四个 “*”	一年当中的第几月	1-12
第五个 “*”	一周当中的星期几	0-7（0 和 7 都代表星期日）

3）查看 crontab

```
[atguigu@hadoop103 shell]$ crontab -l
* * * * * source /etc/profile; /opt/module/shell/hdfstohive.sh
```

6.7 测试

1）启动日志生成程序

2）等待三分钟后，检查 HDFS 的/user/hive/warehouse/applogsdb.db 路径是否有新数据产生。

3）查询所有启动日志信息

```
[atguigu@hadoop103 shell]$ hive
hive (default)> use applogsdb;
hive (applogsdb)> select * from ext_startup_logs;
```

4）查询指定 app 的用户数

```
hive (applogsdb)> select count(distinct deviceid) from ext_startup_logs where appid='sdk34734';
```

5）统计新增用户

需要自定义 UDF 函数

七 业务需求处理

7.1 自定义 UDF 函数

0）需求：

根据输入的时间信息，返回当天的起始时间；

根据输入的时间信息，返回本周的起始时间；

根据输入的时间信息，返回本月的起始时间；

根据输入的时间和时间格式化信息，返回按照格式化要求显示的信息。

1）编写获取日期开始时间、周开始时间、和月开始时间的工具类

```
package com.atguigu.hive;
import java.text.SimpleDateFormat;
import java.util.Calendar;
import java.util.Date;

public class DateUtil {
	/**
	 * 得到指定 date 的零时刻.
	 */
	public static Date getDayBeginTime(Date d) {

		try {
			SimpleDateFormat sdf = new SimpleDateFormat("yyyy/MM/dd 00:00:00");

			return sdf.parse(sdf.format(d));
		} catch (Exception e) {
			e.printStackTrace();
		}

		return null;
	}

	/**
	 * 得到指定 date 的偏移量零时刻.
	 */
	public static Date getDayBeginTime(Date d, int offset) {

		try {
			SimpleDateFormat sdf = new SimpleDateFormat("yyyy/MM/dd 00:00:00");
			Date beginDate = sdf.parse(sdf.format(d));
```

```
            Calendar c = Calendar.getInstance();
            c.setTime(beginDate);
            c.add(Calendar.DAY_OF_MONTH, offset);

            return c.getTime();
        } catch (Exception e) {
            e.printStackTrace();
        }

        return null;
    }

    /**
     * 得到指定 date 所在周的起始时刻.
     */
    public static Date getWeekBeginTime(Date d) {

        try {
            //得到 d 的零时刻
            Date beginDate = getDayBeginTime(d);
            Calendar c = Calendar.getInstance();
            c.setTime(beginDate);
            int n = c.get(Calendar.DAY_OF_WEEK);
            c.add(Calendar.DAY_OF_MONTH, -(n - 1));

            return c.getTime();
        } catch (Exception e) {
            e.printStackTrace();
        }

        return null;
    }

    /**
     * 得到指定 date 所在周的起始时刻.
     */
    public static Date getWeekBeginTime(Date d, int offset) {

        try {
            //得到 d 的零时刻
            Date beginDate = getDayBeginTime(d);
            Calendar c = Calendar.getInstance();
            c.setTime(beginDate);
            int n = c.get(Calendar.DAY_OF_WEEK);

            //定位到本周第一天
            c.add(Calendar.DAY_OF_MONTH, -(n - 1));
            c.add(Calendar.DAY_OF_MONTH, offset * 7);

            return c.getTime();
        } catch (Exception e) {
            e.printStackTrace();
        }

        return null;
    }

    /**
     * 得到指定 date 所在月的起始时刻.
     */
    public static Date getMonthBeginTime(Date d) {

        try {
            //得到 d 的零时刻
            Date beginDate = getDayBeginTime(d);
            SimpleDateFormat sdf = new SimpleDateFormat("yyyy/MM/01 00:00:00");

            return sdf.parse(sdf.format(beginDate));
        } catch (Exception e) {
            e.printStackTrace();
        }

        return null;
    }

    /**
     * 得到指定 date 所在月的起始时刻.
     */
    public static Date getMonthBeginTime(Date d, int offset) {

        try {
            //得到 d 的零时刻
            Date beginDate = getDayBeginTime(d);
            SimpleDateFormat sdf = new SimpleDateFormat("yyyy/MM/01 00:00:00");

            //d 所在月的第一天的零时刻
```

```
                Date firstDay = sdf.parse(sdf.format(beginDate));

                Calendar c = Calendar.getInstance();
                c.setTime(firstDay);

                //对月进行滚动
                c.add(Calendar.MONTH, offset);

                return c.getTime();
            } catch (Exception e) {
                e.printStackTrace();
            }

            return null;
        }
}
```

2）编写 DayBeginUDF、WeekBeginUDF、MonthBeginUDF、FormatTimeUDF 函数

（1）创建 java 工程导入 pom.xml 文件

创建 jar 工程：app_logs_hive

添加 maven 框架支持，并导入 pom 文件，并刷新一下 maven

```
<?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.atguigu</groupId>
    <artifactId>app_logs_hive</artifactId>
    <version>1.0-SNAPSHOT</version>

    <dependencies>
        <dependency>
            <groupId>junit</groupId>
            <artifactId>junit</artifactId>
            <version>4.12</version>
        </dependency>

        <dependency>
            <groupId>org.apache.hive</groupId>
            <artifactId>hive-exec</artifactId>
```

```
                <version>1.2.1</version>
            </dependency>
        </dependencies>
</project>
```

（2）编写 DayBeginUDF

创建包名：com.atguigu.hive

编写代码：

```
package com.atguigu.hive;
import org.apache.hadoop.hive.ql.exec.UDF;
import java.text.ParseException;
import java.text.SimpleDateFormat;
import java.util.Date;

/**
 * 计算 day 起始毫秒数
 */
public class DayBeginUDF extends UDF {

    // 计算现在的起始时刻(毫秒数)
    public long evaluate() throws ParseException {
        return evaluate(new Date());
    }

     // 指定天偏移量
    public long evaluate(int offset) throws ParseException {
        return evaluate(DateUtil.getDayBeginTime(new Date(), offset));
    }

    // 计算某天的起始时刻，日期类型(毫秒数)
    public long evaluate(Date d) throws ParseException {
        return DateUtil.getDayBeginTime(d).getTime();
    }

    // 计算某天的起始时刻，日期类型，带偏移量(毫秒数)
    public long evaluate(Date d, int offset) throws ParseException {
        return DateUtil.getDayBeginTime(d, offset).getTime();
    }

    // 计算某天的起始时刻，String 类型(毫秒数)
    public long evaluate(String dateStr) throws ParseException {
        SimpleDateFormat sdf = new SimpleDateFormat("yyyy/MM/dd HH:mm:ss");
        Date d = sdf.parse(dateStr);

        return evaluate(d);
    }

    // 计算某天的起始时刻，String 类型，带偏移量(毫秒数)
    public long evaluate(String dateStr, int offset) throws ParseException {

        SimpleDateFormat sdf = new SimpleDateFormat("yyyy/MM/dd HH:mm:ss");
        Date d = sdf.parse(dateStr);

        return DateUtil.getDayBeginTime(d, offset).getTime();
    }

    // 计算某天的起始时刻，String 类型，带格式化要求(毫秒数)
    public long evaluate(String dateStr, String fmt) throws ParseException {

        SimpleDateFormat sdf = new SimpleDateFormat(fmt);
        Date d = sdf.parse(dateStr);

        return DateUtil.getDayBeginTime(d).getTime();
    }

    // 计算某天的起始时刻，String 类型，带格式化，带偏移量(毫秒数)
    public long evaluate(String dateStr, String fmt, int offset) throws ParseException {

        SimpleDateFormat sdf = new SimpleDateFormat(fmt);
        Date d = sdf.parse(dateStr);

        return DateUtil.getDayBeginTime(d, offset).getTime();
    }
}
```

（3）编写 WeekBeginUDF

```
package com.atguigu.hive;
import org.apache.hadoop.hive.ql.exec.UDF;
import java.text.ParseException;
import java.text.SimpleDateFormat;
import java.util.Date;

/**
 * Created by atguigu on 2017/11/9
 */
public class WeekBeginUDF extends UDF {

    // 计算本周的起始时间，(毫秒数)
    public long evaluate() throws ParseException {
        return DateUtil.getWeekBeginTime(new Date()).getTime() ;
    }

    // 指定周偏移量
    public long evaluate(int offset) throws ParseException {
        return DateUtil.getWeekBeginTime(new Date(),offset).getTime();
    }

    // 计算某周的起始时刻，日期类型(毫秒数)
    public long evaluate(Date d) throws ParseException {
        return DateUtil.getWeekBeginTime(d).getTime();
    }

    // 计算某周的起始时刻，日期类型，带偏移量(毫秒数)
    public long evaluate(Date d,int offset) throws ParseException {
        return DateUtil.getWeekBeginTime(d,offset).getTime();
    }

    // 计算某周的起始时刻，String 类型(毫秒数)
    public long evaluate(String dateStr) throws ParseException {

        SimpleDateFormat    sdf    =    new    SimpleDateFormat("yyyy/MM/dd
HH:mm:ss");
        Date d = sdf.parse(dateStr);

        return DateUtil.getWeekBeginTime(d).getTime();
    }

    // 计算某周的起始时刻，String 类型，带偏移量(毫秒数)
    public long evaluate(String dateStr,int offset) throws ParseException {
        SimpleDateFormat    sdf    =    new    SimpleDateFormat("yyyy/MM/dd
HH:mm:ss");
        Date d = sdf.parse(dateStr);
        return DateUtil.getWeekBeginTime(d, offset).getTime();
    }

    // 计算某周的起始时刻，String 类型，带格式化要求(毫秒数)
    public long evaluate(String dateStr, String fmt) throws ParseException {
        SimpleDateFormat sdf = new SimpleDateFormat(fmt);
        Date d = sdf.parse(dateStr);

        return DateUtil.getWeekBeginTime(d).getTime();
    }

    // 计算某周的起始时刻，String 类型，带格式化，带偏移量(毫秒数)
    public long evaluate(String dateStr, String fmt,int offset) throws ParseException {

        SimpleDateFormat sdf = new SimpleDateFormat(fmt);
        Date d = sdf.parse(dateStr);

        return DateUtil.getWeekBeginTime(d, offset).getTime();
    }
}
```

（4）编写 MonthBeginUDF

```
package com.atguigu.hive;
import org.apache.hadoop.hive.ql.exec.UDF;
import java.text.ParseException;
import java.text.SimpleDateFormat;
import java.util.Date;

/**
 * Created by atguigu on 2017/11/9
 */
public class MonthBeginUDF extends UDF {

    // 计算本月的起始时刻(毫秒数)
    public long evaluate() throws ParseException {
        return DateUtil.getMonthBeginTime(new Date()).getTime() ;
    }

    // 指定月偏移量
    public long evaluate(int offset) throws ParseException {
        return DateUtil.getMonthBeginTime(new Date(),offset).getTime();
    }

    // 计算某月的起始时刻，日期类型(毫秒数)
    public long evaluate(Date d) throws ParseException {
        return DateUtil.getMonthBeginTime(d).getTime();
    }
	// 计算某月的起始时刻，日期类型，带偏移量(毫秒数)
	public long evaluate(Date d,int offset) throws ParseException {
		return DateUtil.getMonthBeginTime(d,offset).getTime();
	}

	// 计算某月的起始时刻，String 类型(毫秒数)
	public long evaluate(String dateStr) throws ParseException {

		SimpleDateFormat sdf = new SimpleDateFormat("yyyy/MM/dd HH:mm:ss");
		Date d = sdf.parse(dateStr);

		return DateUtil.getMonthBeginTime(d).getTime();
	}

	// 计算某月的起始时刻，String 类型，带偏移量(毫秒数)
	public long evaluate(String dateStr,int offset) throws ParseException {

		SimpleDateFormat sdf = new SimpleDateFormat("yyyy/MM/dd HH:mm:ss");
		Date d = sdf.parse(dateStr);

		return DateUtil.getMonthBeginTime(d, offset).getTime();
	}

	// 计算某月的起始时刻，String 类型，带格式化要求(毫秒数)
	public long evaluate(String dateStr, String fmt) throws ParseException {

		SimpleDateFormat sdf = new SimpleDateFormat(fmt);
		Date d = sdf.parse(dateStr);

		return DateUtil.getMonthBeginTime(d).getTime();
	}

	// 计算某月的起始时刻，String 类型，带格式化，带偏移量(毫秒数)
	public long evaluate(String dateStr, String fmt,int offset) throws ParseException {

		SimpleDateFormat sdf = new SimpleDateFormat(fmt);
		Date d = sdf.parse(dateStr);

		return DateUtil.getMonthBeginTime(d, offset).getTime();
	}
}
```

（5）编写 FormatTimeUDF

```
package com.atguigu.hive;
import org.apache.hadoop.hive.ql.exec.UDF;
import java.text.ParseException;
import java.text.SimpleDateFormat;
import java.util.Date;

/**
 * Created by atguigu on 2017/11/9
 */
public class FormatTimeUDF extends UDF{

    // 根据输入的时间毫秒值（long 类型）和格式化要求，返回 String 类型时间
    public String evaluate(long ms,String fmt) throws ParseException {

        SimpleDateFormat sdf = new SimpleDateFormat(fmt) ;
        Date d = new Date();
        d.setTime(ms);

        return sdf.format(d) ;
    }

    // 根据输入的时间毫秒值（String 类型）和格式化要求，返回 String 类型时间
    public String evaluate(String ms,String fmt) throws ParseException {

        SimpleDateFormat sdf = new SimpleDateFormat(fmt) ;
        Date d = new Date();
        d.setTime(Long.parseLong(ms));

        return sdf.format(d) ;
    }

    // 根据输入的时间毫秒值（long 类型）、格式化要求，和区分周的任意值，返
回 String 类型时间
    public String evaluate(long ms ,String fmt , int week) throws ParseException {

        Date d = new Date();
        d.setTime(ms);

        //周内第一天
        Date firstDay = DateUtil.getWeekBeginTime(d) ;
        SimpleDateFormat sdf = new SimpleDateFormat(fmt) ;
```

```
                return sdf.format(firstDay) ;
        }
}
```

3）导出 jar 包（app_logs_hive.jar）

4）添加 app_logs_hive.jar 到类路径/opt/module/hive/lib 下

（1）临时添加 jar 包：

```
hive (applogsdb)> add jar /opt/module/hive/lib/app_logs_hive.jar;
```

（2）永久添加 jar 包：

在 hive-site.xml 文件中添加

```
<property>
        <name>hive.aux.jars.path</name>
        <value>file:///opt/module/hive/lib/app_logs_hive.jar</value>
</property>
```

由于之前添加过 json 的 jar 包所以修改为如下方式

```
<property>
        <name>hive.aux.jars.path</name>

<value>file:///opt/module/hive/lib/json-serde-1.3.8-jar-with-dependencies.jar,file:///opt/module/hive/lib/app_logs_hive.jar</value>
</property>
```

5）注册永久函数

```
hive (default)>create function getdaybegin AS 'com.atguigu.hive.DayBeginUDF';

hive (default)>create function getweekbegin AS 'com.atguigu.hive.WeekBeginUDF';

hive (default)>create function getmonthbegin AS 'com.atguigu.hive.MonthBeginUDF';

hive (default)>create function formattime AS 'com.atguigu.hive.FormatTimeUDF';
```

6）验证函数

登录 mysql

```
[atguigu@hadoop102 ~]$ mysql -uroot -p000000

mysql> show databases;

mysql> use metastore;

mysql> show tables;

mysql> select * from FUNCS;
```

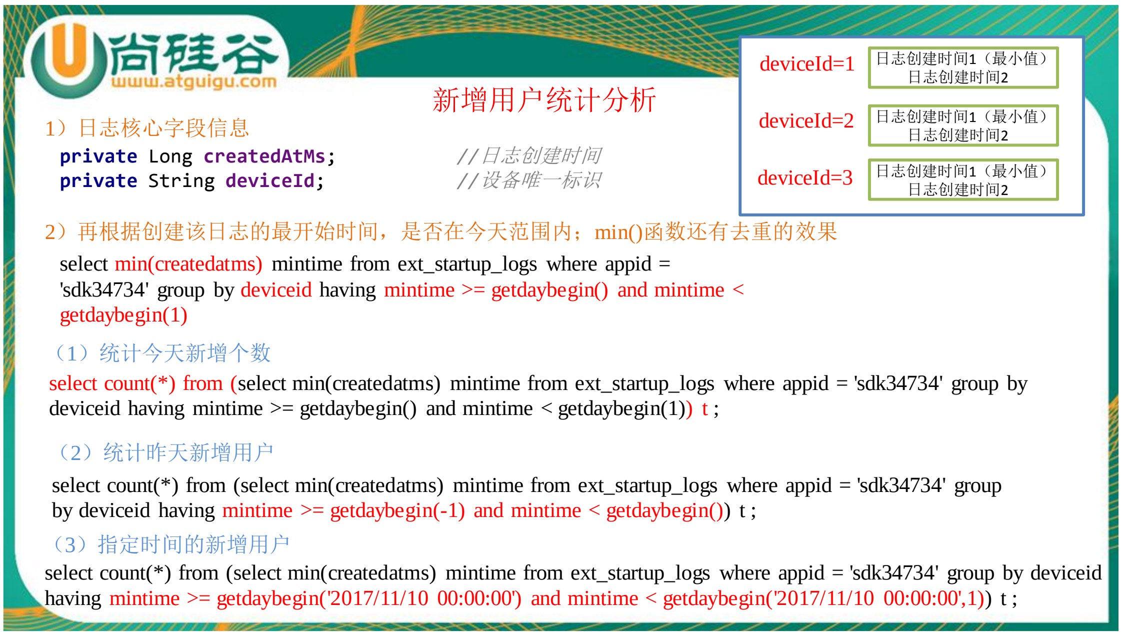
7）删除函数

```
hive (applogsdb)> drop function getdaybegin;

hive (applogsdb)> drop function getweekbegin;

hive (applogsdb)> drop function getmonthbegin;

hive (applogsdb)> drop function formattime;
```

8）注意：在哪个数据库中注册的永久函数，必须在哪个数据库下将该方法删除

比如在 applogsdb 数据库中创建的方法，必须在该数据中调用 drop 方法才能实现删除功能。

7.2 新增用户统计



新增用户统计分析

1）日志核心字段信息

```
private Long createdAtMs;          //日志创建时间
private String deviceId;           //设备唯一标识
```

deviceId=1	日志创建时间1（最小值） 日志创建时间2
deviceId=2	日志创建时间1（最小值） 日志创建时间2
deviceId=3	日志创建时间1（最小值） 日志创建时间2

2）再根据创建该日志的最开始时间，是否在今天范围内；min()函数还有去重的效果

select min(createdatms) mintime from ext_startup_logs where appid = 'sdk34734' group by deviceid having mintime >= getdaybegin() and mintime < getdaybegin(1)

（1）统计今天新增个数

select count(*) from (select min(createdatms) mintime from ext_startup_logs where appid = 'sdk34734' group by deviceid having mintime >= getdaybegin() and mintime < getdaybegin(1)) t ;

（2）统计昨天新增用户

select count(*) from (select min(createdatms) mintime from ext_startup_logs where appid = 'sdk34734' group by deviceid having mintime >= getdaybegin(-1) and mintime < getdaybegin()) t ;

（3）指定时间的新增用户

select count(*) from (select min(createdatms) mintime from ext_startup_logs where appid = 'sdk34734' group by deviceid having mintime >= getdaybegin('2017/11/10 00:00:00') and mintime < getdaybegin('2017/11/10 00:00:00',1)) t ;

7.2.1 任意日新增用户

1）今天新增用户

（1）判断今天新增用户条件：

先按照设备 id 分组；

再根据创建该日志的最开始时间，是否在今天范围内。

（2）统计今天新增个数

```
select
count(*)
from
(select min(createdatms) mintime
from ext_startup_logs
where appid = 'sdk34734'
group by deviceid
having mintime >= getdaybegin() and mintime < getdaybegin(1)
)t ;
```

2）昨天新增用户

```
select
count(*)
from
(select min(createdatms) mintime
from ext_startup_logs
where appid = 'sdk34734'
group by deviceid
having mintime >= getdaybegin(-1) and mintime < getdaybegin()
)t ;
```

3）指定时间的新增用户

```
select
count(*)
from
(select min(createdatms) mintime
from ext_startup_logs
where appid = 'sdk34734'
group by deviceid
having mintime >= getdaybegin('2017/11/10 00:00:00') and mintime <
getdaybegin('2017/11/10 00:00:00',1)
)t ;
```

7.2.2 任意周新增用户

1）本周新增用户

```
select
count(*)
from
(select min(createdatms) mintime
from ext_startup_logs
where appid = 'sdk34734'
group by deviceid
having mintime >= getweekbegin() and mintime < getweekbegin(1)
) t ;
```

2）上一周新增用户

```
select
count(*)
```

```
from
(select min(createdatms) mintime
from ext_startup_logs
where appid = 'sdk34734'
group by deviceid
having mintime >= getweekbegin(-1) and mintime < getweekbegin()
)t ;
```

3）指定周时间的新增用户

```
select
count(*)
from
(select min(createdatms) mintime
from ext_startup_logs
where appid = 'sdk34734'
group by deviceid
having mintime >= getweekbegin('2017/10/10 00:00:00') and mintime < getweekbegin('2017/10/10 00:00:00',1)
)t ;
```

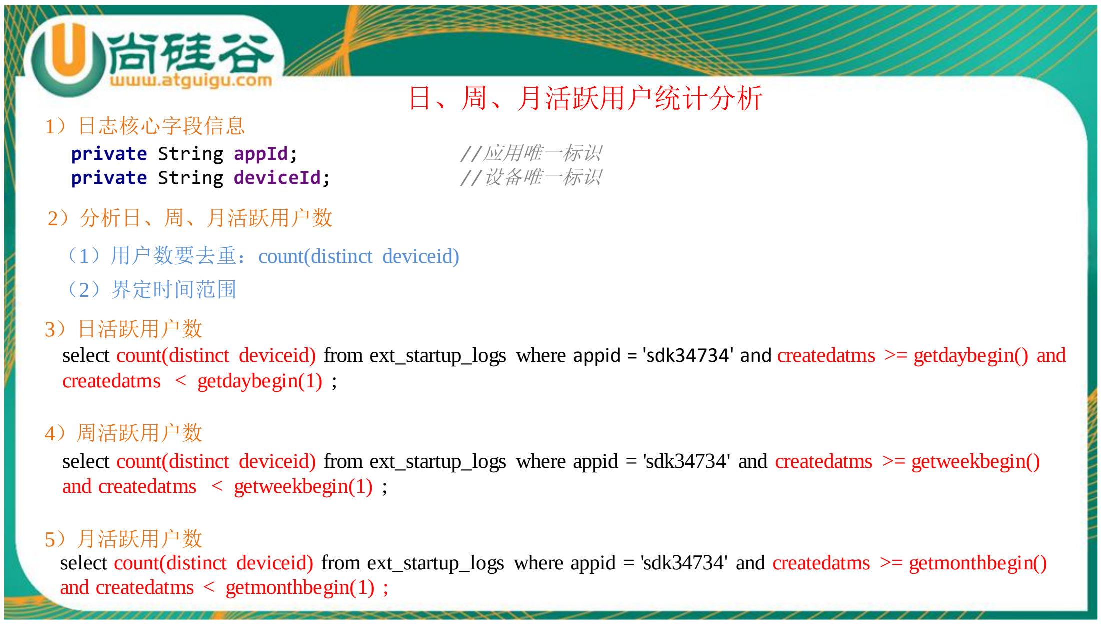
7.2.3 月新增用户

```
select
count(*)
from
(select min(createdatms) mintime
from ext_startup_logs
where appid = 'sdk34734'
group by deviceid
having mintime >= getmonthbegin() and mintime < getmonthbegin(1)
)t ;
```

7.3 活跃用户统计

7.3.1 日、周、月活跃用户

0）分析：


日、周、月活跃用户统计分析

1）日志核心字段信息

```
private String appId;            //应用唯一标识
private String deviceId;         //设备唯一标识
```

2）分析日、周、月活跃用户数

（1）用户数要去重：count(distinct deviceid)

（2）界定时间范围

3）日活跃用户数

select count(distinct deviceid) from ext_startup_logs where appid = 'sdk34734' and createdatms >= getdaybegin() and createdatms < getdaybegin(1)；

4）周活跃用户数

select count(distinct deviceid) from ext_startup_logs where appid = 'sdk34734' and createdatms >= getweekbegin() and createdatms < getweekbegin(1)；

5）月活跃用户数

select count(distinct deviceid) from ext_startup_logs where appid = 'sdk34734' and createdatms >= getmonthbegin() and createdatms < getmonthbegin(1)；

1）日活跃用户数

```
select
count(distinct deviceid)
from ext_startup_logs
where appid = 'sdk34734'
and createdatms >= getdaybegin() and createdatms < getdaybegin(1);
```

2）周活跃用户数

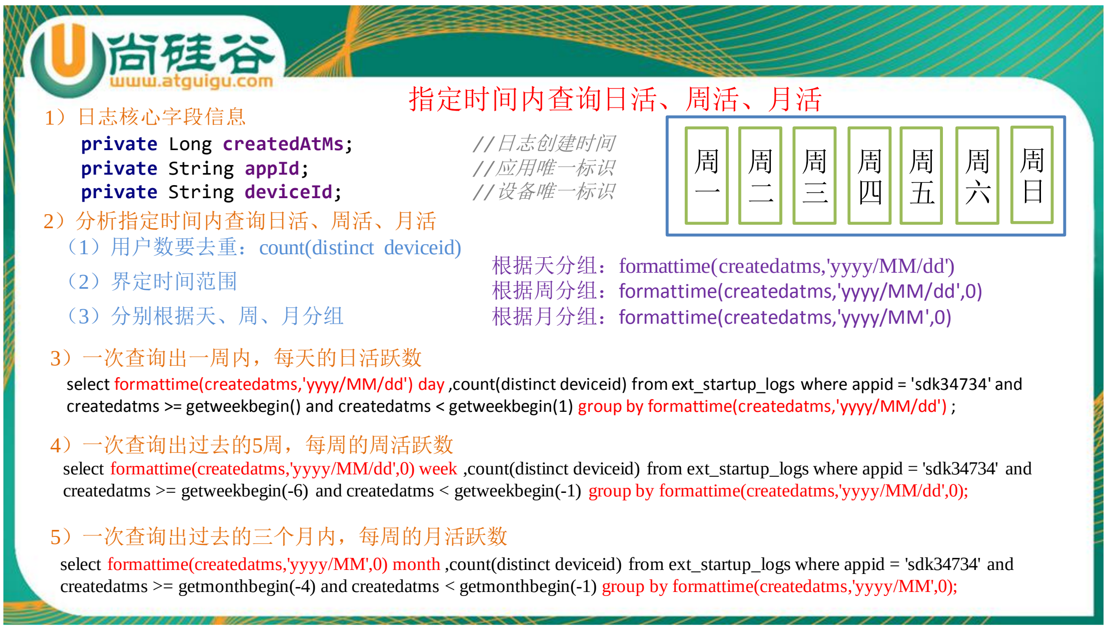
```
select
count(distinct deviceid)
from ext_startup_logs
where appid = 'sdk34734'
and createdatms >= getweekbegin() and createdatms < getweekbegin(1);
```

3）月活跃用户数

```
select
count(distinct deviceid)
from ext_startup_logs
where appid = 'sdk34734'
and createdatms >= getmonthbegin() and createdatms < getmonthbegin(1);
```

7.3.2 指定时间内查询日活、周活、月活

0）分析



指定时间内查询日活、周活、月活

1）日志核心字段信息

```
private Long createdAtMs;      //日志创建时间
private String appId;          //应用唯一标识
private String deviceId;       //设备唯一标识
```

2）分析指定时间内查询日活、周活、月活

（1）用户数要去重：count(distinct deviceid)

（2）界定时间范围

（3）分别根据天、周、月分组

根据天分组：formattime(createdatms,'yyyy/MM/dd')
根据周分组：formattime(createdatms,'yyyy/MM/dd',0)
根据月分组：formattime(createdatms,'yyyy/MM',0)

3）一次查询出一周内，每天的日活跃数

select formattime(createdatms,'yyyy/MM/dd') day ,count(distinct deviceid) from ext_startup_logs where appid = 'sdk34734' and createdatms >= getweekbegin() and createdatms < getweekbegin(1) group by formattime(createdatms,'yyyy/MM/dd') ;

4）一次查询出过去的5周，每周的周活跃数

select formattime(createdatms,'yyyy/MM/dd',0) week ,count(distinct deviceid) from ext_startup_logs where appid = 'sdk34734' and createdatms >= getweekbegin(-6) and createdatms < getweekbegin(-1) group by formattime(createdatms,'yyyy/MM/dd',0);

5）一次查询出过去的三个月内，每周的月活跃数

select formattime(createdatms,'yyyy/MM',0) month ,count(distinct deviceid) from ext_startup_logs where appid = 'sdk34734' and createdatms >= getmonthbegin(-4) and createdatms < getmonthbegin(-1) group by formattime(createdatms,'yyyy/MM',0);

1）一次查询出一周内，每天的日活跃数

```
select
formattime(createdatms,'yyyy/MM/dd') day ,count(distinct deviceid)
from ext_startup_logs
where appid = 'sdk34734'
and createdatms >= getweekbegin() and createdatms < getweekbegin(1)
group by formattime(createdatms,'yyyy/MM/dd');
```

2）一次查询出过去的 5 周，每周的周活跃数

```
select
formattime(createdatms,'yyyy/MM/dd',0) week ,count(distinct deviceid)
from ext_startup_logs
where appid = 'sdk34734'
and createdatms >= getweekbegin(-6) and createdatms < getweekbegin(-1)
group by formattime(createdatms,'yyyy/MM/dd',0);
```

3）一次查询出过去的三个月内，每周的月活跃数

```
select
formattime(createdatms,'yyyy/MM',0) month ,count(distinct deviceid)
from ext_startup_logs
where appid = 'sdk34734'
and createdatms >= getmonthbegin(-4) and createdatms < getmonthbegin(-1)
group by formattime(createdatms,'yyyy/MM',0);
```

7.3.3 优化活跃数查询

根据时间分区表去查询，避免全表扫描

```
select
count(distinct deviceid)
```

```
from ext_startup_logs
where appid = 'sdk34734'
and ym = formattime(getdaybegin(),'yyyyMM') and day = formattime(getdaybegin(),'dd');
```

7.3.4 过去五周周活跃用户数

过去的五周(包含本周)某个 app 每周的周活跃用户数

连接函数测试：select concat(ym,day) from ext_startup_logs;

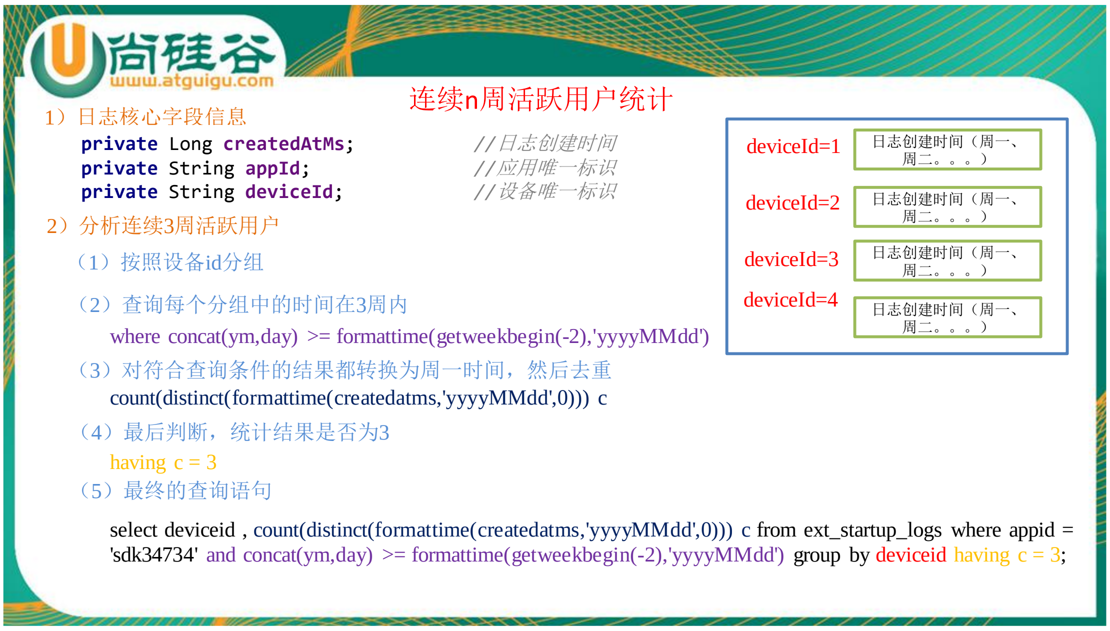
```
select
formattime(createdatms,'yyyyMMdd',0) stdate, count(distinct deviceid) stcount
from ext_startup_logs
where concat(ym,day) >= formattime(getweekbegin(-4),'yyyyMMdd') and appid ='sdk34734'
group by formattime(createdatms,'yyyyMMdd',0);
```

7.3.5 过去六月活跃用户数

最近的六个月(包含本月)每月的月活跃数。

```
select
formattime(createdatms,'yyyyMM') stdate, count(distinct deviceid) stcount
from ext_startup_logs
where ym >= formattime(getmonthbegin(-5),'yyyyMM') and appid ='sdk34734'
group by formattime(createdatms,'yyyyMM');
```

7.3.6 连续 n 周活跃用户统计



连续n周活跃用户统计

1）日志核心字段信息

```
private Long createdAtMs;        //日志创建时间
private String appId;            //应用唯一标识
private String deviceId;         //设备唯一标识
```

2）分析连续3周活跃用户

（1）按照设备id分组

（2）查询每个分组中的时间在3周内

where concat(ym,day) >= formattime(getweekbegin(-2),'yyyyMMdd')

（3）对符合查询条件的结果都转换为周一时间，然后去重

count(distinct(formattime(createdatms,'yyyyMMdd',0))) c

（4）最后判断，统计结果是否为3

having c = 3

（5）最终的查询语句

select deviceid , count(distinct(formattime(createdatms,'yyyyMMdd',0))) c from ext_startup_logs where appid = 'sdk34734' and concat(ym,day) >= formattime(getweekbegin(-2),'yyyyMMdd') group by deviceid having c = 3;

deviceId=1
日志创建时间（周一、周二。。。）
deviceId=2
日志创建时间（周一、周二。。。）
deviceId=3
日志创建时间（周一、周二。。。）
deviceId=4
日志创建时间（周一、周二。。。）

连续活跃 3 周

```
select deviceid , count(distinct(formattime(createdatms,'yyyyMMdd',0))) c
from ext_startup_logs
```

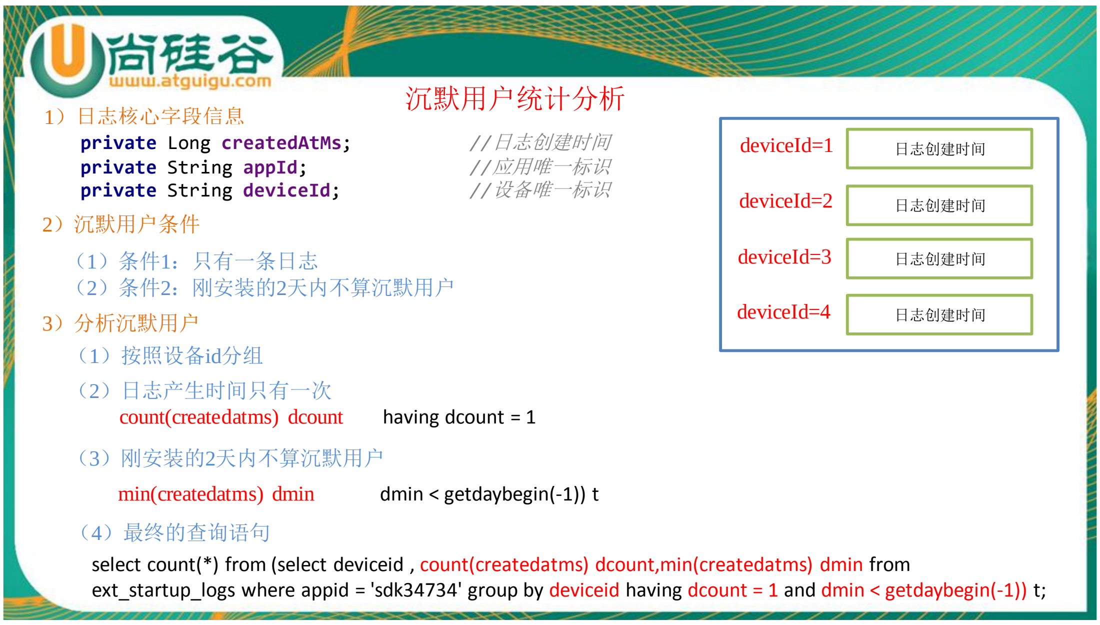
```
where appid = 'sdk34734'
and concat(ym,day) >= formattime(getweekbegin(-2),'yyyyMMdd')
group by deviceid
having c = 3;
```

7.3.7 忠诚用户

忠诚用户（连续活跃 5 周）

```
select deviceid , count(distinct(formattime(createdatms,'yyyyMMdd',0))) c
from ext_startup_logs
where appid = 'sdk34734'
and concat(ym,day) >= formattime(getweekbegin(-4),'yyyyMMdd')
group by deviceid
having c = 5;
```

7.4 沉默用户统计



沉默用户统计分析

1）日志核心字段信息

```
private Long createdAtMs;          //日志创建时间
private String appId;              //应用唯一标识
private String deviceId;           //设备唯一标识
```

2）沉默用户条件

（1）条件1：只有一条日志
（2）条件2：刚安装的2天内不算沉默用户

3）分析沉默用户

（1）按照设备id分组

（2）日志产生时间只有一次
count(createdatms) dcount　　having dcount = 1

（3）刚安装的2天内不算沉默用户
min(createdatms) dmin　　dmin < getdaybegin(-1)) t

（4）最终的查询语句

```
select count(*) from (select deviceid , count(createdatms) dcount,min(createdatms) dmin from
ext_startup_logs where appid = 'sdk34734' group by deviceid having dcount = 1 and dmin < getdaybegin(-1)) t;
```

查询沉默用户数（一共只有一条日志；且安装时间超过 2 天）

```
select
count(*)
from
(select deviceid , count(createdatms) dcount,min(createdatms) dmin
from ext_startup_logs
where appid = 'sdk34734'
group by deviceid
having dcount = 1 and dmin < getdaybegin(-1)
)t;
```

7.5 启动次数统计

今天 app 的启动次数

启动次数类似于活跃用户数，活跃用户数去重，启动次数不需要去重。

```
select
count(deviceid)
from ext_startup_logs
where appid = 'sdk34734'
and ym = formattime(getdaybegin(),'yyyyMM') and day = formattime(getdaybegin(),'dd');
```

7.6 版本分布统计

1）今天 appid 为 34734 的不同版本的活跃用户数。

```
select
appversion,count(distinct deviceid)
from ext_startup_logs
where appid = 'sdk34734'
and ym = formattime(getdaybegin(),'yyyyMM') and day = formattime(getdaybegin(),'dd')
group by appversion;
```

2）本周内每天各版本日活跃数

（1）本周内：where concat(ym,day) >= formattime(getweekbegin(),'yyyyMMdd')

（2）每天：group by formattime(createdatms,'yyyyMMdd')

（2）各个版本：group by appversion

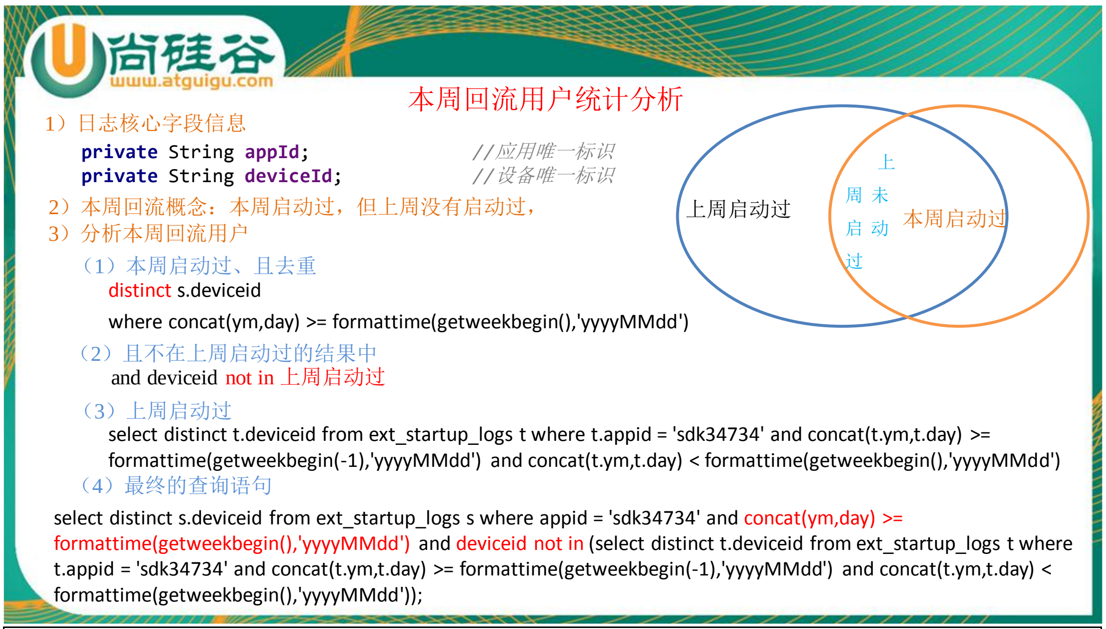
（3）日活跃数：count(distinct deviceid)

```
select
formattime(createdatms,'yyyyMMdd'),appversion , count(distinct deviceid)
from ext_startup_logs
where appid = 'sdk34734'
and concat(ym,day) >= formattime(getweekbegin(),'yyyyMMdd')
group by formattime(createdatms,'yyyyMMdd'), appversion;
```

7.7 留存分析统计

7.7.1 本周回流用户统计

本周回流用户：上周没有启动过，本周启动过。



本周回流用户统计分析

1）日志核心字段信息

```
private String appId;             //应用唯一标识
private String deviceId;          //设备唯一标识
```

2）本周回流概念：本周启动过，但上周没有启动过，

3）分析本周回流用户

（1）本周启动过、且去重

distinct s.deviceid

where concat(ym,day) >= formattime(getweekbegin(),'yyyyMMdd')

（2）且不在上周启动过的结果中

and deviceid not in 上周启动过

（3）上周启动过

select distinct t.deviceid from ext_startup_logs t where t.appid = 'sdk34734' and concat(t.ym,t.day) >= formattime(getweekbegin(-1),'yyyyMMdd') and concat(t.ym,t.day) < formattime(getweekbegin(),'yyyyMMdd')

（4）最终的查询语句

select distinct s.deviceid from ext_startup_logs s where appid = 'sdk34734' and concat(ym,day) >= formattime(getweekbegin(),'yyyyMMdd') and deviceid not in (select distinct t.deviceid from ext_startup_logs t where t.appid = 'sdk34734' and concat(t.ym,t.day) >= formattime(getweekbegin(-1),'yyyyMMdd') and concat(t.ym,t.day) < formattime(getweekbegin(),'yyyyMMdd'));

```
select
distinct s.deviceid
from ext_startup_logs s
where appid = 'sdk34734' and concat(ym,day) >= formattime(getweekbegin(),'yyyyMMdd')
and deviceid not in (
select
distinct t.deviceid
from ext_startup_logs t
where t.appid = 'sdk34734' and concat(t.ym,t.day) >= formattime(getweekbegin(-1),'yyyyMMdd') and concat(t.ym,t.day) < formattime(getweekbegin(),'yyyyMMdd')
);
```

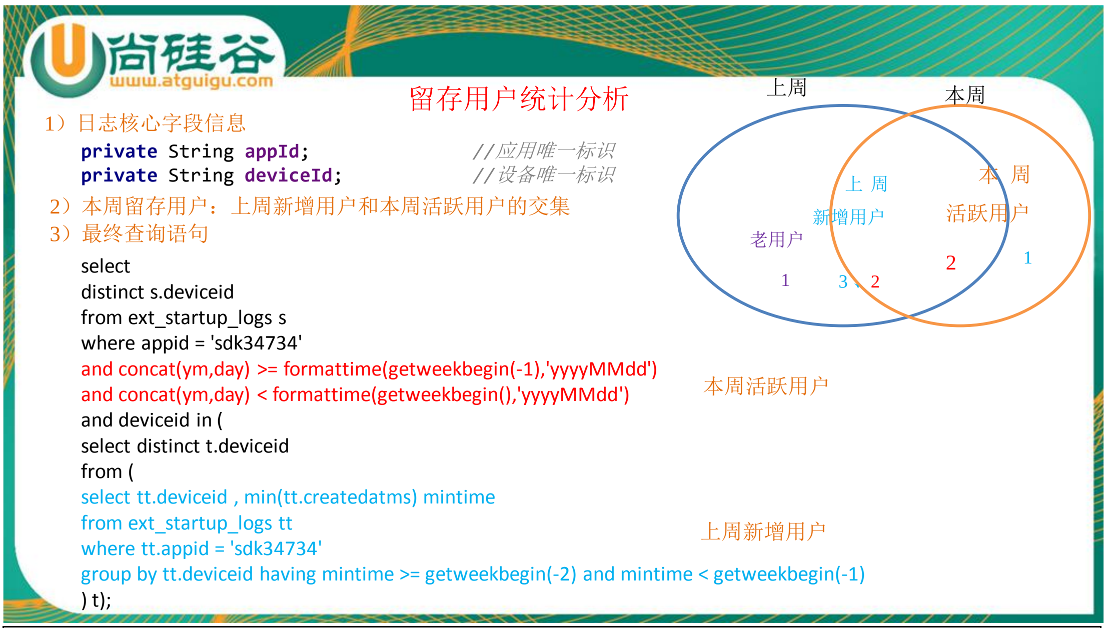
7.7.2 连续 n 周没有启动的用户

连续 2 周内没有启动过：本周和上周没启动过；大上周启动过

```
select
distinct s.deviceid
from ext_startup_logs s
where appid='sdk34734'
and concat(ym,day) >= formattime(getweekbegin(-2),'yyyyMMdd')
and concat(ym,day) < formattime(getweekbegin(-1),'yyyyMMdd')
and deviceid not in (
select
distinct(t.deviceid)
from ext_startup_logs t
where t.appid='sdk34734'
and concat(t.ym,t.day) >= formattime(getweekbegin(-1),'yyyyMMdd')
);
```

7.7.3 留存用户统计

本周留存用户=上周新增用户和本周活跃用户的交集



留存用户统计分析

1）日志核心字段信息

```
private String appId;            //应用唯一标识
private String deviceId;         //设备唯一标识
```

2）本周留存用户：上周新增用户和本周活跃用户的交集

3）最终查询语句

```
select
distinct s.deviceid
from ext_startup_logs s
where appid = 'sdk34734'
and concat(ym,day) >= formattime(getweekbegin(-1),'yyyyMMdd')
and concat(ym,day) < formattime(getweekbegin(),'yyyyMMdd')
and deviceid in (
select distinct t.deviceid
from (
select tt.deviceid , min(tt.createdatms) mintime
from ext_startup_logs tt
where tt.appid = 'sdk34734'
group by tt.deviceid having mintime >= getweekbegin(-2) and mintime < getweekbegin(-1)
) t);
```

本周活跃用户

上周新增用户

```
select
distinct s.deviceid
from ext_startup_logs s
where appid = 'sdk34734'
and concat(ym,day) >= formattime(getweekbegin(-1),'yyyyMMdd')
and concat(ym,day) < formattime(getweekbegin(),'yyyyMMdd')
and deviceid in (
select distinct t.deviceid
from (
select tt.deviceid , min(tt.createdatms) mintime
from ext_startup_logs tt
where tt.appid = 'sdk34734'
group by tt.deviceid having mintime >= getweekbegin(-2) and mintime < getweekbegin(-1)
) t);
```

7.8 新鲜度分析

用户新鲜度 ＝ 某段时间的新增用户数/某段时间的活跃的用户数 ．

1）今天新增用户（为 n）

```
select
count(*)
from
```

```
(select min(createdatms) mintime
from ext_startup_logs
where appid = 'sdk34734'
group by deviceid
having mintime >= getdaybegin() and mintime < getdaybegin(1)
)t;
```

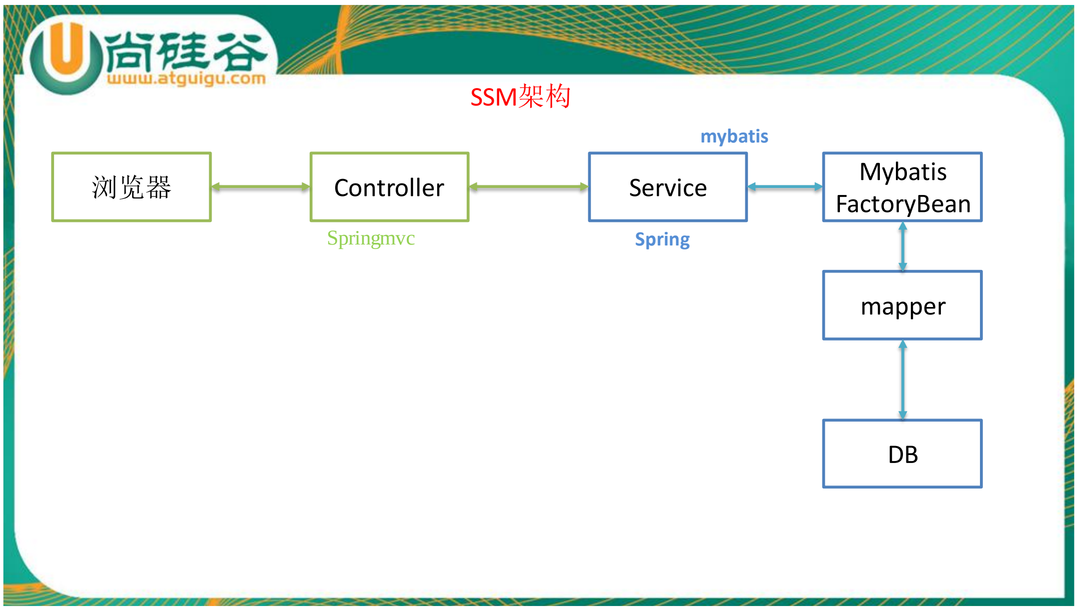
2）今天活跃用户（m）

```
select
count(distinct deviceid)
from ext_startup_logs
where appid = 'sdk34734'
and createdatms >= getdaybegin() and createdatms < getdaybegin(1);
```

3）新鲜度 = n / m

注意判断 m 等于 0 的情况。

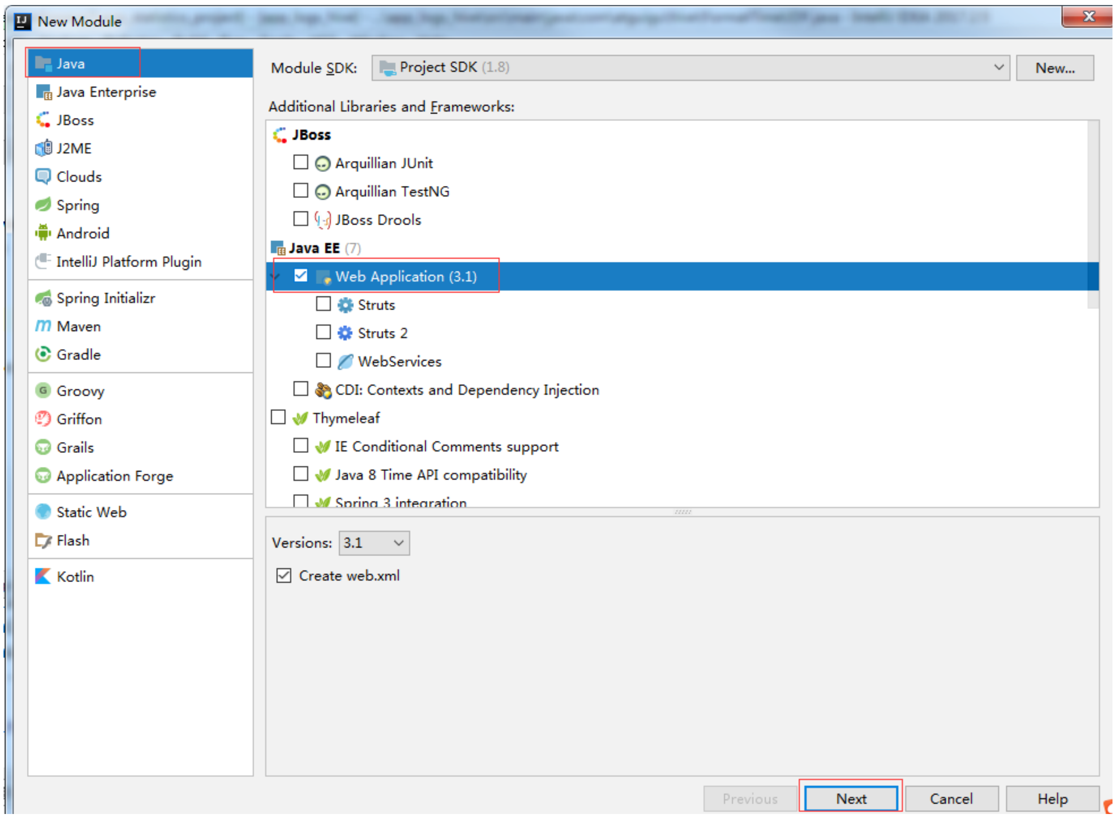
八 数据展示模块



8.1 创建 web 可视化工程

8.1.1 创建 web 工程导入 pom.xml

1）创建一个 web 工程：app_logs_visualize_web



Module SDK: Project SDK (1.8)

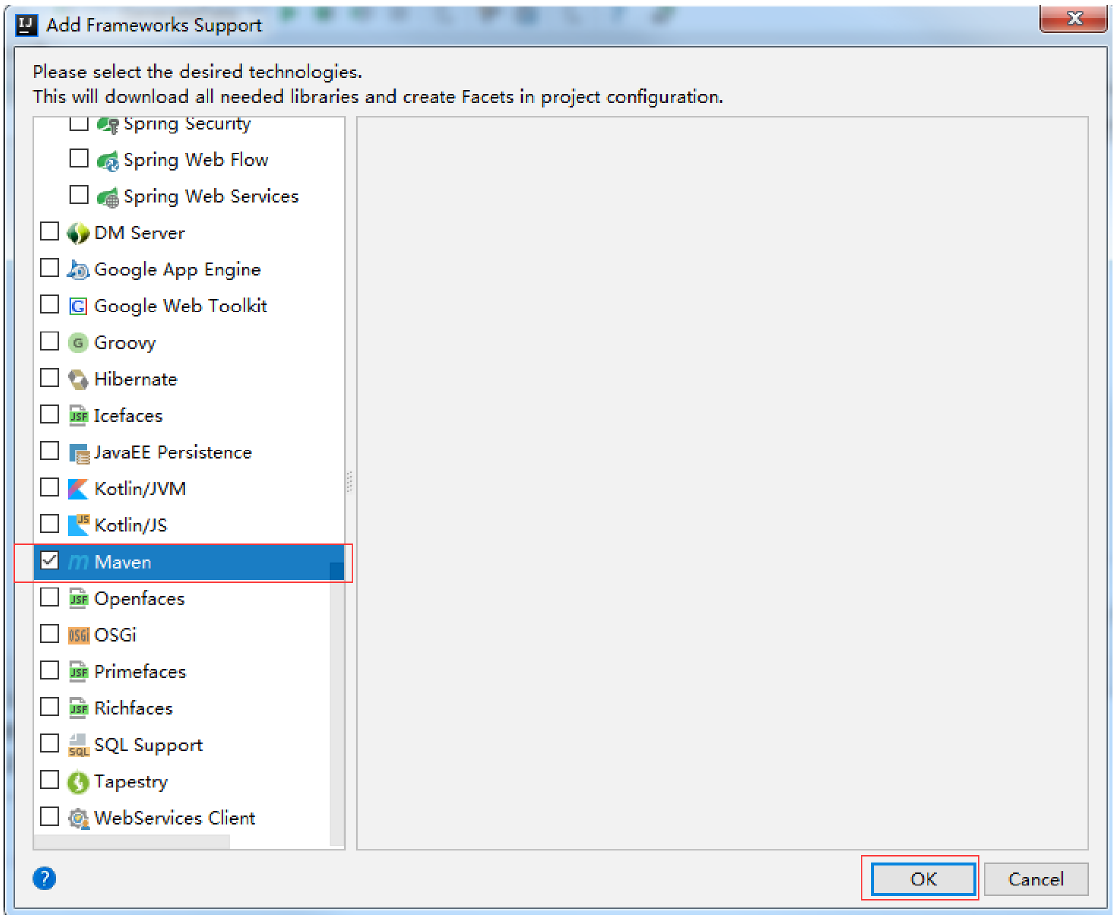
Additional Libraries and Frameworks:

- JBoss
  - ☐ Arquillian JUnit
  - ☐ Arquillian TestNG
  - ☐ JBoss Drools
- Java EE (7)
  - ☑ Web Application (3.1)
    - ☐ Struts
    - ☐ Struts 2
    - ☐ WebServices
  - ☐ CDI: Contexts and Dependency Injection
- ☐ Thymeleaf
  - ☐ IE Conditional Comments support
  - ☐ Java 8 Time API compatibility
  - ☐ Spring 3 integration

Versions: 3.1

☑ Create web.xml

2）添加 maven 框架支持



Please select the desired technologies.
This will download all needed libraries and create Facets in project configuration.

- ☐ Spring Security
- ☐ Spring Web Flow
- ☐ Spring Web Services
- ☐ DM Server
- ☐ Google App Engine
- ☐ Google Web Toolkit
- ☐ Groovy
- ☐ Hibernate
- ☐ Icefaces
- ☐ JavaEE Persistence
- ☐ Kotlin/JVM
- ☐ Kotlin/JS
- ☑ Maven
- ☐ Openfaces
- ☐ OSGi
- ☐ Primefaces
- ☐ Richfaces
- ☐ SQL Support
- ☐ Tapestry
- ☐ WebServices Client

3）导入 pom 文件

```
<?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.atguigu</groupId>
    <artifactId>app_logs_visualize_web</artifactId>
    <version>1.0-SNAPSHOT</version>
    <packaging>war</packaging>

    <!--tomcat 插件-->
    <build>
        <plugins>
            <plugin>
                <groupId>org.apache.tomcat.maven</groupId>
                <artifactId>tomcat7-maven-plugin</artifactId>
                <version>2.2</version>
                <configuration>
                    <!-- http port -->
                    <port>8080</port>
                    <path>/</path>
                </configuration>
            </plugin>
        </plugins>
    </build>

    <!--日志框架版本号-->
    <properties>
        <log4j.version>1.2.17</log4j.version>
        <slf4j.version>1.7.22</slf4j.version>
    </properties>

    <dependencies>
        <!--日志框架-->
        <dependency>
            <groupId>org.slf4j</groupId>
            <artifactId>jcl-over-slf4j</artifactId>
            <version>${slf4j.version}</version>
        </dependency>
        <dependency>
```

```
            <groupId>org.slf4j</groupId>
            <artifactId>slf4j-api</artifactId>
            <version>${slf4j.version}</version>
        </dependency>
        <dependency>
            <groupId>org.slf4j</groupId>
            <artifactId>slf4j-log4j12</artifactId>
            <version>${slf4j.version}</version>
        </dependency>
        <dependency>
            <groupId>log4j</groupId>
            <artifactId>log4j</artifactId>
            <version>${log4j.version}</version>
        </dependency>

        <!--单元测试-->
        <dependency>
            <groupId>junit</groupId>
            <artifactId>junit</artifactId>
            <version>4.11</version>
        </dependency>
        <!--mybatis 框架-->
        <dependency>
            <groupId>org.mybatis</groupId>
            <artifactId>mybatis</artifactId>
            <version>3.2.1</version>
        </dependency>
        <dependency>
            <groupId>c3p0</groupId>
            <artifactId>c3p0</artifactId>
            <version>0.9.1.2</version>
        </dependency>
        <dependency>
            <groupId>org.mybatis</groupId>
            <artifactId>mybatis-spring</artifactId>
            <version>1.3.0</version>
        </dependency>

        <!--spring 框架-->
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-webmvc</artifactId>
            <version>4.3.3.RELEASE</version>
        </dependency>
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-jdbc</artifactId>
            <version>4.3.3.RELEASE</version>
        </dependency>

        <dependency>
            <groupId>org.aspectj</groupId>
            <artifactId>aspectjweaver</artifactId>
            <version>1.8.10</version>
        </dependency>
        <dependency>
            <groupId>javax.servlet</groupId>
            <artifactId>javax.servlet-api</artifactId>
            <version>3.0.1</version>
            <scope>provided</scope>
        </dependency>

        <dependency>
            <groupId>jstl</groupId>
            <artifactId>jstl</artifactId>
            <version>1.2</version>
        </dependency>
        <dependency>
            <groupId>taglibs</groupId>
            <artifactId>standard</artifactId>
            <version>1.1.2</version>
        </dependency>

        <!--jackson json 解析框架-->
        <dependency>
            <groupId>com.fasterxml.jackson.core</groupId>
            <artifactId>jackson-core</artifactId>
            <version>2.8.8</version>
        </dependency>
        <dependency>
            <groupId>com.fasterxml.jackson.core</groupId>
            <artifactId>jackson-databind</artifactId>
            <version>2.8.3</version>
        </dependency>

        <!-- hive 框架 -->
        <dependency>
            <groupId>org.apache.hive</groupId>
            <artifactId>hive-jdbc</artifactId>
            <exclusions>
                <exclusion>
                    <groupId>org.eclipse.jetty.aggregate</groupId>
                    <artifactId>jetty-all</artifactId>
                </exclusion>
                <exclusion>
                    <groupId>org.mortbay.jetty</groupId>
                    <artifactId>jetty</artifactId>
                </exclusion>
                <exclusion>
                    <groupId>tomcat</groupId>
                    <artifactId>jasper-compiler</artifactId>
                </exclusion>
                <exclusion>
                    <groupId>tomcat</groupId>
                    <artifactId>jasper-runtime</artifactId>
                </exclusion>
                <exclusion>
                    <groupId>org.mortbay.jetty</groupId>
                    <artifactId>jsp-2.1</artifactId>
                </exclusion>
                <exclusion>
                    <groupId>org.mortbay.jetty</groupId>
                    <artifactId>jsp-api-2.1</artifactId>
                </exclusion>
                <exclusion>
                    <groupId>org.eclipse.jetty.orbit</groupId>
                    <artifactId>javax.servlet</artifactId>
                </exclusion>
                <exclusion>
                    <groupId>javax.servlet</groupId>
                    <artifactId>servlet-api</artifactId>
                </exclusion>
                <exclusion>
                    <groupId>javax.servlet</groupId>
                    <artifactId>jsp-api</artifactId>
                </exclusion>
                <exclusion>
                    <groupId>javax.servlet.jsp</groupId>
                    <artifactId>jsp-api</artifactId>
                    </exclusion>
                    <exclusion>
                        <groupId>org.mortbay.jetty</groupId>
                        <artifactId>servlet-api-2.5</artifactId>
                    </exclusion>
                    <exclusion>
                        <groupId>org.mortbay.jetty</groupId>
                        <artifactId>servlet-api</artifactId>
                    </exclusion>
                </exclusions>
                <version>2.1.0</version>
            </dependency>

        </dependencies>
</project>
```

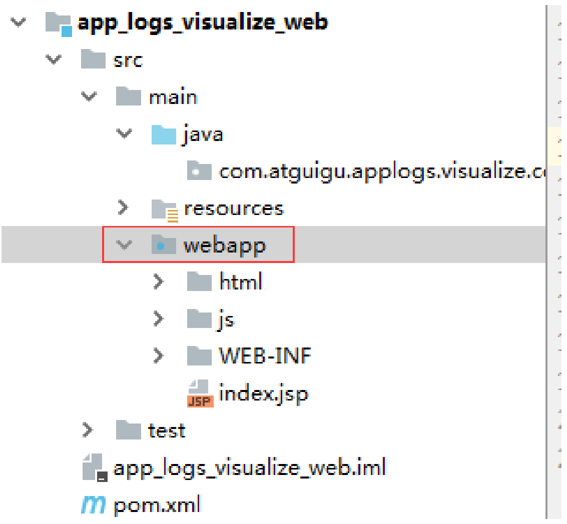
8.1.2 导入静态资源并调整 web 目录

1）向 html 文件中导入

2）导入 index.jsp

3）导入 echarts.js

4）将 web 文件夹整体拖拽到 main 路径下，并修改 web 名称为 webapp



```
app_logs_visualize_web
  src
    main
      java
        com.atguigu.applogs.visualize.c
      resources
      webapp
        html
        js
        WEB-INF
        index.jsp
    test
  app_logs_visualize_web.iml
  pom.xml
```

8.1.3 在 web.xml 文件中加载 Spring 和 Springmvc 配置

web.xml

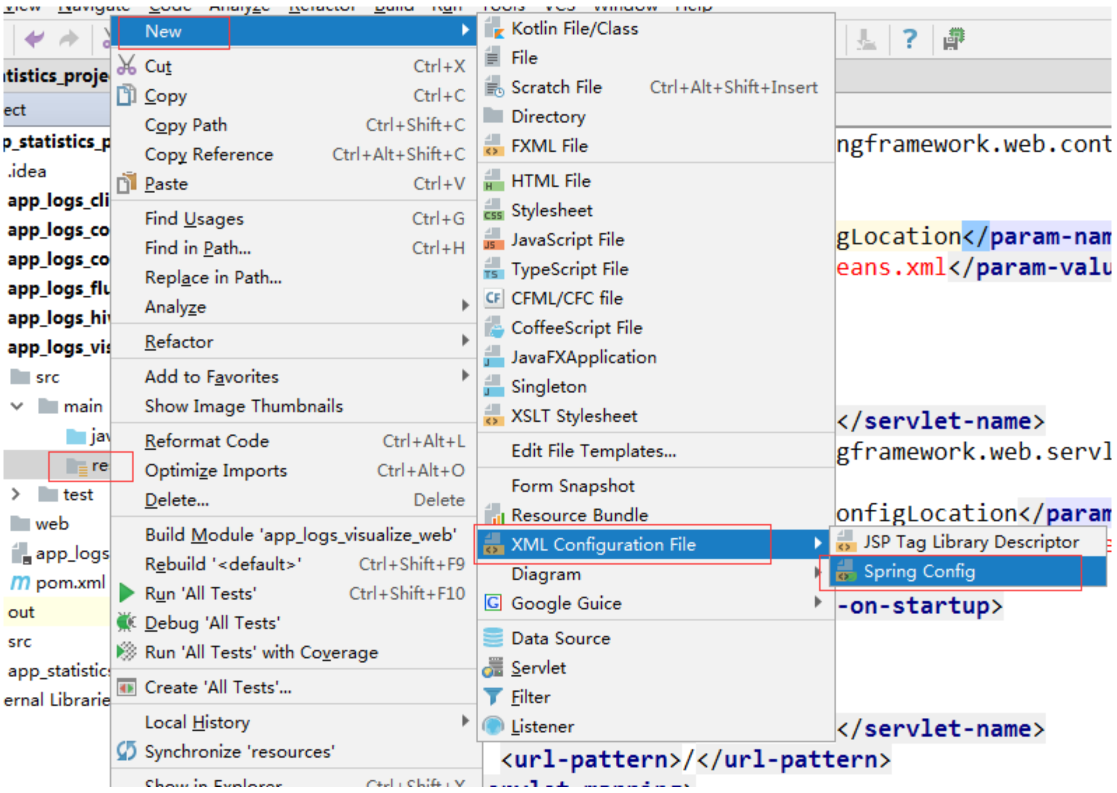
```
<?xml version="1.0" encoding="UTF-8"?>
<web-app                    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns="http://java.sun.com/xml/ns/javaee"
```

```
xsi:schemaLocation="http://java.sun.com/xml/ns/javaee
http://java.sun.com/xml/ns/javaee/web-app_2_5.xsd" id="WebApp_ID" version="2.5">
  <display-name>app_logs_visualize_web</display-name>
    <!--欢迎页面入口-->
  <welcome-file-list>
    <welcome-file>index.html</welcome-file>
    <welcome-file>index.htm</welcome-file>
    <welcome-file>index.jsp</welcome-file>
    <welcome-file>default.html</welcome-file>
    <welcome-file>default.htm</welcome-file>
    <welcome-file>default.jsp</welcome-file>
  </welcome-file-list>

    <!--1 spring 加载配置-->
    <listener>

<listener-class>org.springframework.web.context.ContextLoaderListener</listener-class>
    </listener>
    <context-param>
        <param-name>contextConfigLocation</param-name>
        <param-value>classpath:beans.xml</param-value>
    </context-param>

    <!--2 springmvc 加载配置-->
    <servlet>
        <servlet-name>dispatcher</servlet-name>
        <servlet-class>org.springframework.web.servlet.DispatcherServlet</servlet-class>
        <init-param>
            <param-name>contextConfigLocation</param-name>
            <param-value>classpath:dispatcher-servlet.xml</param-value>
        </init-param>
        <load-on-startup>1</load-on-startup>
    </servlet>

    <servlet-mapping>
        <servlet-name>dispatcher</servlet-name>
        <url-pattern>/</url-pattern>
    </servlet-mapping>

    <!--3  解决传输中文乱码-->
    <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>
            <init-param>
                <param-name>forceEncoding</param-name>
                <param-value>true</param-value>
            </init-param>
        </filter>
        <filter-mapping>
            <filter-name>characterEncodingFilter</filter-name>
            <url-pattern>/*</url-pattern>
        </filter-mapping>
</web-app>
```

8.1.4 在 resources 路径下添加 Springmvc 配置文件

1）添加文件



2）编写文件：dispatcher-servlet.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:mvc="http://www.springframework.org/schema/mvc"
        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/mvc

http://www.springframework.org/schema/mvc/spring-mvc.xsd
                                http://www.springframework.org/schema/context

http://www.springframework.org/schema/context/spring-context.xsd
                                ">
    <mvc:annotation-driven/>
    <!-- 添加静态资源 -->
    <mvc:resources mapping="/html/**" location="/html/"/>
    <mvc:resources mapping="/js/**" location="/js/"/>

    <!-- 扫描控制器 -->
    <context:component-scan
base-package="com.atguigu.applogs.visualize.controller"/>

    <!-- 配置视图解析器 -->
    <bean                                                        id="viewResolver"
class="org.springframework.web.servlet.view.InternalResourceViewResolver">
        <property name="prefix" value="/"/>
        <property name="suffix" value=".jsp"/>
    </bean>
</beans>
```

3）创建 package：

com.atguigu.applogs.visualize.controller

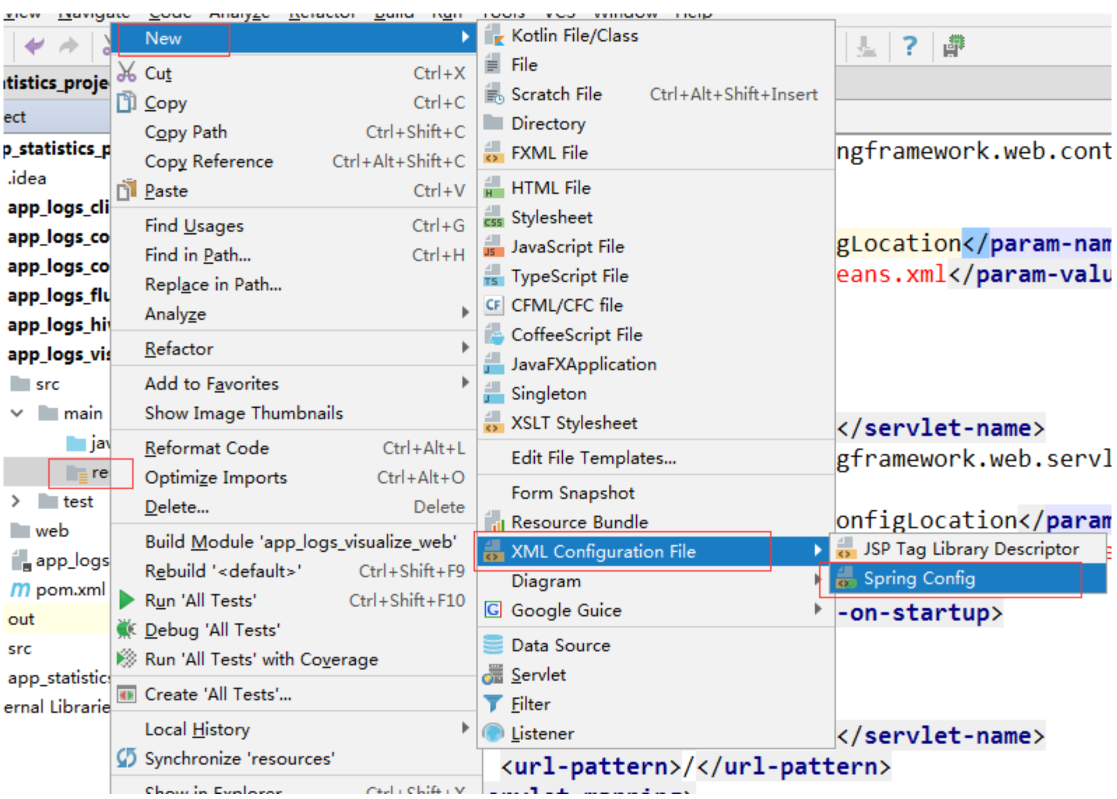
com.atguigu.applogs.visualize.service

com.atguigu.applogs.visualize.dao

com.atguigu.applogs.visualize.domain

8.1.5 在 resources 路径下添加 Spring 配置文件

1）添加文件



2）编写文件：beans.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<beans xmlns="http://www.springframework.org/schema/beans"
    xmlns:tx="http://www.springframework.org/schema/tx"
xmlns:aop="http://www.springframework.org/schema/aop"
    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.xsd
                                http://www.springframework.org/schema/context

http://www.springframework.org/schema/context/spring-context-4.3.xsd
                                http://www.springframework.org/schema/tx

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

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

    <!-- 扫描 service 包 -->
    <context:component-scan base-package="com.atguigu.applogs.visualize.service" />

    <!-- 连接 hive 数据源 -->
    <bean id="dataSource" class="com.mchange.v2.c3p0.ComboPooledDataSource">
        <property name="driverClass" value="org.apache.hive.jdbc.HiveDriver" />
        <property  name="jdbcUrl"  value="jdbc:hive2://192.168.1.103:10000/applogsdb"
/>
        <property name="user" value="atguigu" />
        <property name="password" value="" />
    </bean>

    <bean                                                   id="sqlSessionFactoryBean"
class="org.mybatis.spring.SqlSessionFactoryBean">
        <property name="dataSource" ref="dataSource" />
        <property name="configLocation" value="classpath:mybatis-config.xml" />
    </bean>

    <bean id="statMapper" class="org.mybatis.spring.mapper.MapperFactoryBean">
        <property                                              name="mapperInterface"
value="com.atguigu.applogs.visualize.dao.StatMapper"></property>
        <property name="sqlSessionFactory" ref="sqlSessionFactoryBean"></property>
    </bean>
</beans>
```

3）在 com.atguigu.applogs.visualize.dao 路径下创建 StatMapper 接口

```
package com.atguigu.applogs.visualize.dao;
public interface StatMapper<T> {
}
```

7.1.6 在 resources 路径下添加 mybatis 配置文件

mybatis-config.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>

    <mappers>
        <mapper resource="StatMapper.xml" />
    </mappers>
</configuration>
```

7.1.7 在 resources 路径下添加 mybatis 的 mapper 配置文件

StatMapper.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="com.atguigu.applogs.visualize.dao.StatMapper">
    <!-- 查询新增用户 -->
    <select id="findNewUsers" resultMap="rm_StatBean">
        select count(*) stcount from ext_startup_logs
    </select>

    <resultMap                                                      id="rm_StatBean"
type="com.atguigu.applogs.visualize.domain.StatBean">
        <result column="stcount" property="count" />
    </resultMap>

    <select id="findThisWeekNewUsers" resultMap="rm_weekUser">
        select formattime(t.mintime,'yyyy/MM/dd') stdate , count(*) stcount
            from (
                select deviceid,min(createdatms) mintime
                from ext_startup_logs
                where appid = #{appid} group by deviceid having mintime &gt;= getweekbegin()
and mintime &lt; getweekbegin(1)
            ) t
            group by formattime(t.mintime,'yyyy/MM/dd')
    </select>
    <resultMap                                                      id="rm_weekUser"
type="com.atguigu.applogs.visualize.domain.StatBean">
        <result column="stcount" property="count" />
        <result column="stdate" property="date" />
    </resultMap>
</mapper>
```

7.1.8 在 resources 路径下添加 log4j 文件

log4j.properties

```
log4j.rootLogger=info, stdout
log4j.appender.stdout=org.apache.log4j.ConsoleAppender
log4j.appender.stdout.layout=org.apache.log4j.PatternLayout
log4j.appender.stdout.layout.ConversionPattern=%d{yyyy-MM-dd HH:mm:ss,SSS}   %5p ---
[%50t]   %-80c(line:%5L)   :   %m%n

log4j.appender.R=org.apache.log4j.RollingFileAppender
```

```
log4j.appender.R.File=analysis.log
log4j.appender.R.MaxFileSize=1024KB
log4j.appender.R.MaxBackupIndex=1

log4j.appender.R.layout=org.apache.log4j.PatternLayout
log4j.appender.R.layout.ConversionPattern=%d{yyyy-MM-dd  HH:mm:ss,SSS}    %5p  ---
[%50t]  %-80c(line:%6L)  :  %m%n
```

7.1.9 在 hive 端启动 hiveserver2

```
[atguigu@hadoop103 lib]$ hiveserver2 &
```

8.2 代码逻辑实现

8.2.1 准备统计结果 bean

```
package com.atguigu.applogs.visualize.domain;

/**
 * 统计信息
 */
public class StatBean {
    //统计日期
    private String date ;
    //统计数量
    private long count ;

    public String getDate() {
        return date;
    }

    public void setDate(String date) {
        this.date = date;
    }

    public long getCount() {
        return count;
    }

    public void setCount(long count) {
        this.count = count;
    }
}
```

8.2.2 编写 controller 逻辑

```
package com.atguigu.applogs.visualize.controller;

import com.atguigu.applogs.visualize.domain.StatBean;
import com.atguigu.applogs.visualize.service.StatService;
import org.springframework.stereotype.Controller;
import org.springframework.web.bind.annotation.RequestMapping;
import org.springframework.web.bind.annotation.ResponseBody;
import javax.annotation.Resource;
import java.util.ArrayList;
import java.util.HashMap;
import java.util.List;
import java.util.Map;

/**
 * 统计分析类
 */
@Controller
@RequestMapping("/stat")
public class StatController {

    @Resource(name="statService")
    private StatService ss ;

    /**
     * 统计每周每天新增用户数
     */
    @RequestMapping("/week1")
    @ResponseBody
    public Map<String, Object> stat3() {

        // 1 查询每周每天新增用户数
        List<StatBean> list = ss.findThisWeekNewUsers("sdk34734");
        Map<String,Object> map = new HashMap<String,Object>();

        String[] xlabels = new String[list.size()] ;
        long[] newUsers = new long[list.size()];

        // 2 将查询结果复制给数组
        for(int i = 0 ; i < list.size() ; i ++){
            xlabels[i] = list.get(i).getDate();
            newUsers[i] = list.get(i).getCount();
        }

        // 3  把数组复制给 map 集合
        map.put("date",xlabels);
        map.put("count", newUsers);

        return map ;
    }
}
```

8.2.3 编写 service 逻辑

1) 编写 StatService 接口

```
package com.atguigu.applogs.visualize.service;
import com.atguigu.applogs.visualize.domain.StatBean;
import java.util.List;

/**
 * Service
 */
public interface StatService {

    List<StatBean> findThisWeekNewUsers(String appid);
}
```

2) 编写 StatService 接口实现类

```
package com.atguigu.applogs.visualize.service;
import com.atguigu.applogs.visualize.dao.StatMapper;
import com.atguigu.applogs.visualize.domain.StatBean;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.stereotype.Service;
import java.util.List;

/**
 *  统计服务
 */
@Service("statService")
public class StatServiceImpl implements StatService {

    @Autowired
    StatMapper statMapper;

    @Override
```

```
        public List<StatBean> findThisWeekNewUsers(String sdk34734) {
                return statMapper.findThisWeekNewUsers(sdk34734);
        }
}
```

8.2.4 编写 dao 逻辑

1）编写到接口

```
package com.atguigu.applogs.visualize.dao;
import com.atguigu.applogs.visualize.domain.StatBean;
import java.util.List;

/**
  * BaseDao 接口
  */
public interface StatMapper<T> {

    List<StatBean> findThisWeekNewUsers(String appid);
}
```

2）具体的 dao 接口实现类在 StatMapper.xml 文件中编写

8.3 UI 页面数据展示

0） echarts 案例网站：http://echarts.baidu.com/echarts2/doc/example.html

1）在用户分析的 a 标签里面增加 id

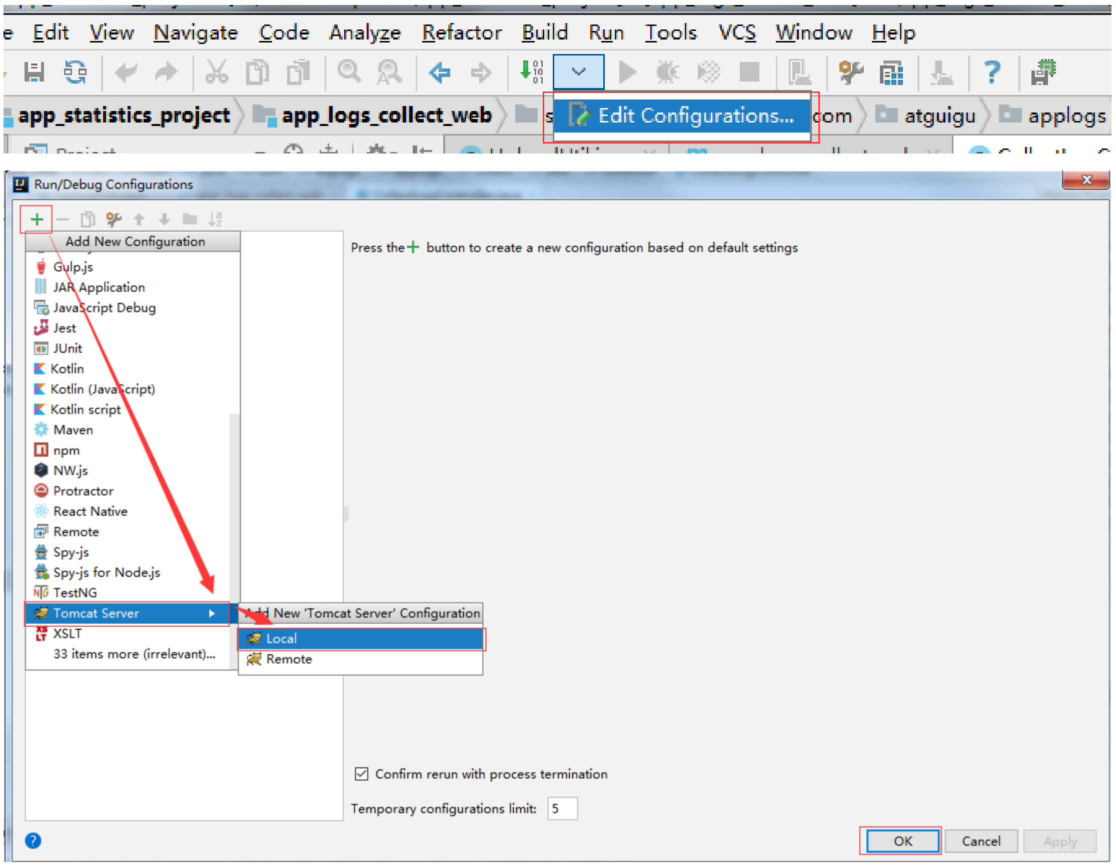
```
<a id="a_newusers" href='javascript:;'>新增用户</a>
```

2）对 a 标签增加异步请求，获取 json 数据

```
$("#a_newusers").click(function(){

        $.getJSON("/stat/week1",function(d){
                option.xAxis.data = d.date;
                option.series[0].data = d.count;

                myChart.setOption(option);
        });
});
```

8.4 IDEA 上执行 Web 程序

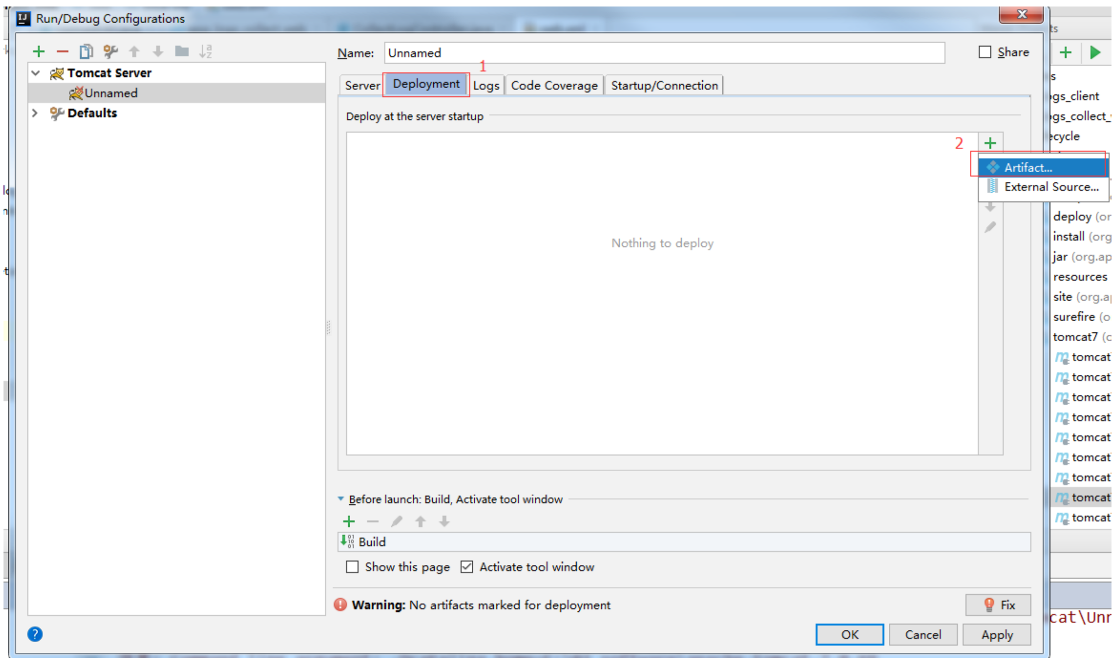
1）配置 web 执行程序方式



Press the + button to create a new configuration based on default settings

Confirm rerun with process termination

Temporary configurations limit: 5



Name: Unnamed

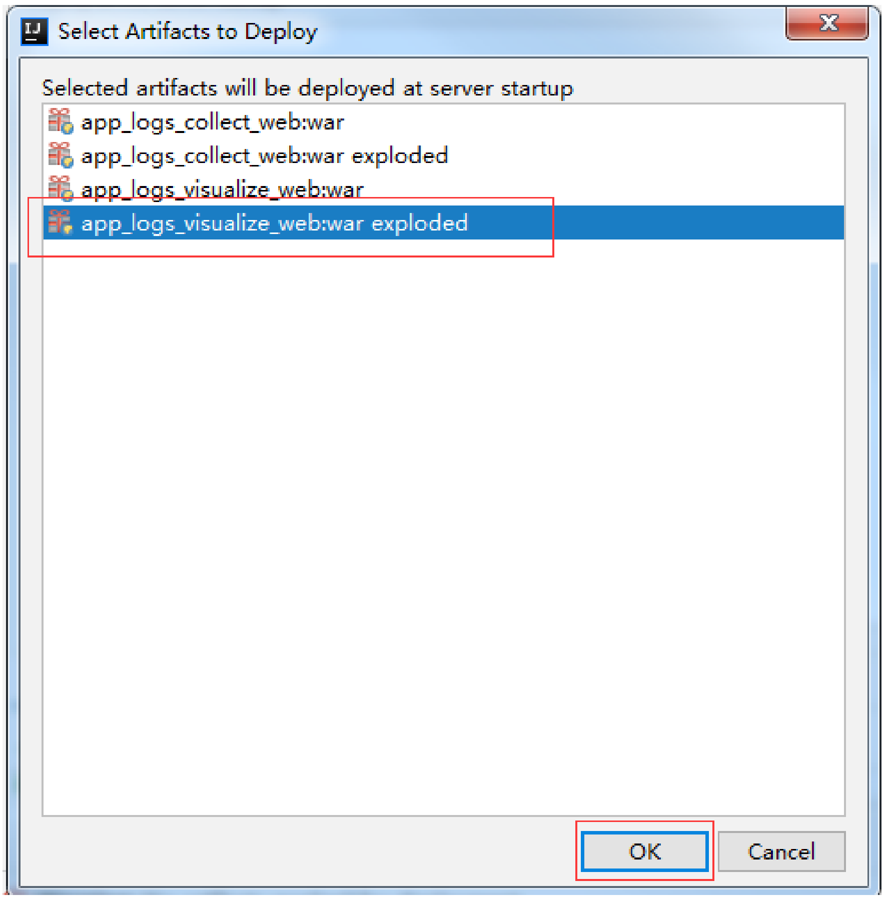
Deploy at the server startup

Before launch: Build, Activate tool window

Build

Show this page ☑ Activate tool window

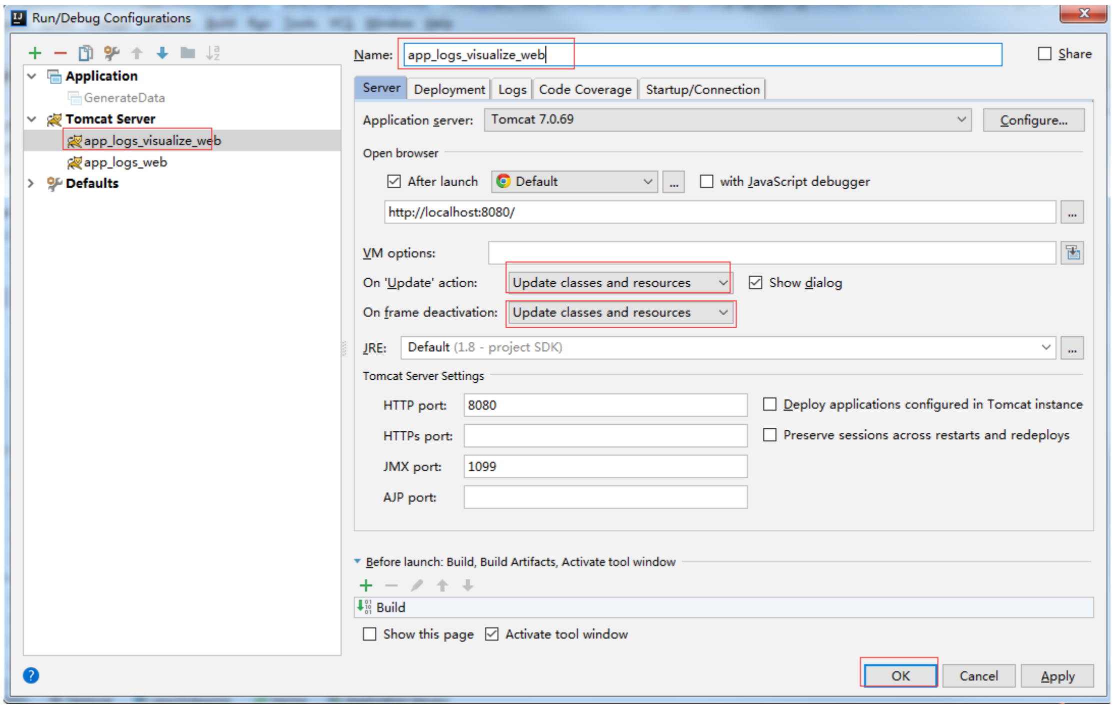
Warning: No artifacts marked for deployment



Select Artifacts to Deploy

Selected artifacts will be deployed at server startup

- app_logs_collect_web:war
- app_logs_collect_web:war exploded
- app_logs_visualize_web:war
- app_logs_visualize_web:war exploded



Run/Debug Configurations

- Application
  - GenerateData
- Tomcat Server
  - app_logs_visualize_web
  - app_logs_web
- Defaults

Name: app_logs_visualize_web ☐ Share

Server | Deployment | Logs | Code Coverage | Startup/Connection

Application server: Tomcat 7.0.69 Configure...

Open browser

☑ After launch Default ☐ with JavaScript debugger

http://localhost:8080/

VM options:

On 'Update' action: Update classes and resources ☑ Show dialog

On frame deactivation: Update classes and resources

JRE: Default (1.8 - project SDK)

Tomcat Server Settings

HTTP port: 8080 ☐ Deploy applications configured in Tomcat instance

HTTPs port: ☐ Preserve sessions across restarts and redeploys

JMX port: 1099

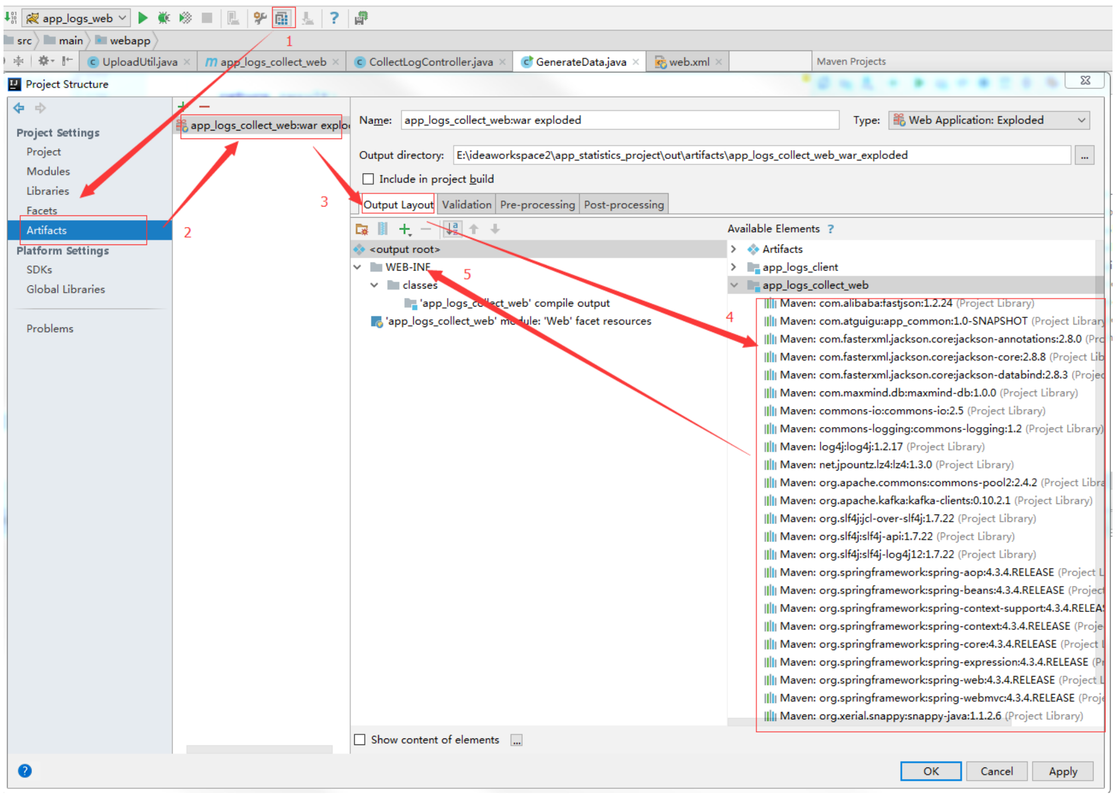
AJP port:

Before launch: Build, Build Artifacts, Activate tool window

Build

☐ Show this page ☑ Activate tool window

3）向 web 工程中添加 jar 包依赖



app_logs_collect_web:war exploded

Name: app_logs_collect_web:war exploded   Type: Web Application: Exploded

Output directory: E:\ideaworkspace2\app_statistics_project\out\artifacts\app_logs_collect_web_war_exploded

☐ Include in project build

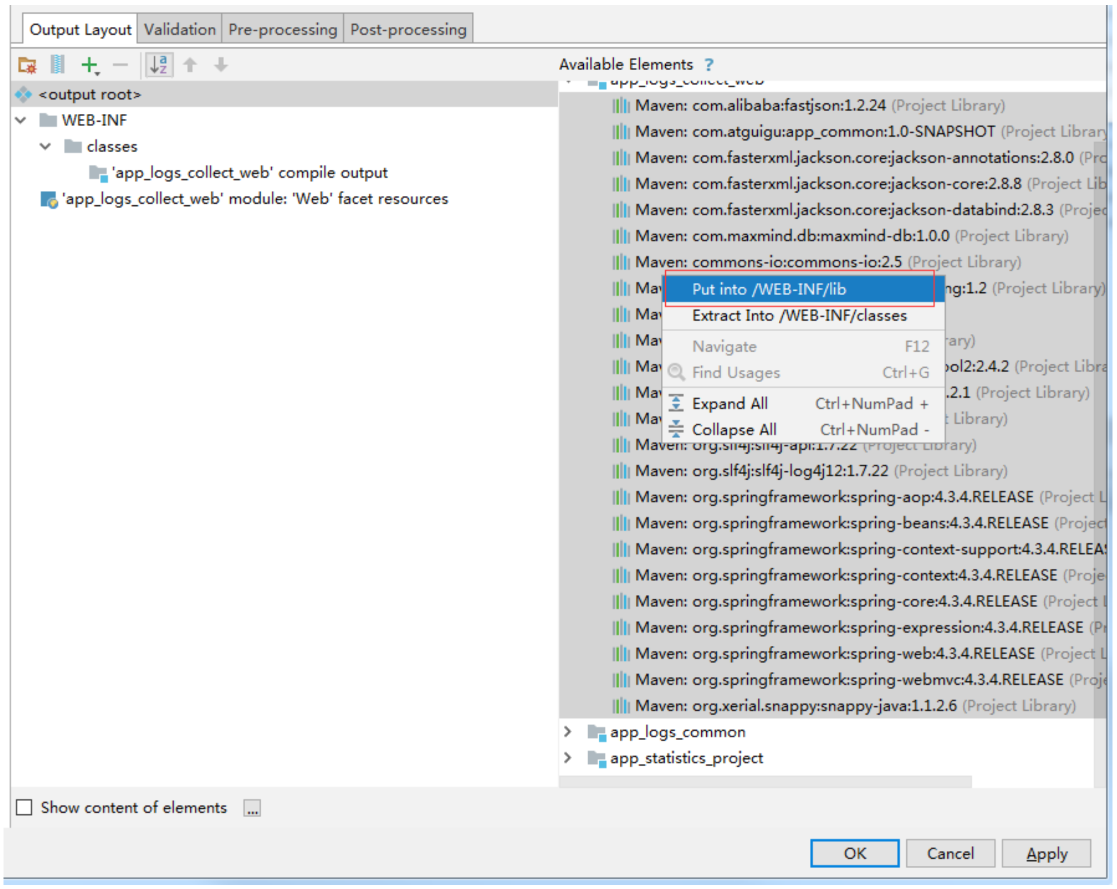
Output Layout | Validation | Pre-processing | Post-processing

```
<output root>
  WEB-INF
    classes
      'app_logs_collect_web' compile output
  'app_logs_collect_web' module: 'Web' facet resources
```

☐ Show content of elements

Available Elements ?

```
> Artifacts
> app_logs_client
v app_logs_collect_web
    Maven: com.alibaba:fastjson:1.2.24 (Project Library)
    Maven: com.atguigu:app_common:1.0-SNAPSHOT (Project Library)
    Maven: com.fasterxml.jackson.core:jackson-annotations:2.8.0 (Pro
    Maven: com.fasterxml.jackson.core:jackson-core:2.8.8 (Project Lib
    Maven: com.fasterxml.jackson.core:jackson-databind:2.8.3 (Projec
    Maven: com.maxmind.db:maxmind-db:1.0.0 (Project Library)
    Maven: commons-io:commons-io:2.5 (Project Library)
    Maven: commons-logging:commons-logging:1.2 (Project Library)
    Maven: log4j:log4j:1.2.17 (Project Library)
    Maven: net.jpountz.lz4:lz4:1.3.0 (Project Library)
    Maven: org.apache.commons:commons-pool2:2.4.2 (Project Libra
    Maven: org.apache.kafka:kafka-clients:0.10.2.1 (Project Library)
    Maven: org.slf4j:jcl-over-slf4j:1.7.22 (Project Library)
    Maven: org.slf4j:slf4j-api:1.7.22 (Project Library)
    Maven: org.slf4j:slf4j-log4j12:1.7.22 (Project Library)
    Maven: org.springframework:spring-aop:4.3.4.RELEASE (Project L
    Maven: org.springframework:spring-beans:4.3.4.RELEASE (Projec
    Maven: org.springframework:spring-context-support:4.3.4.RELEAS
    Maven: org.springframework:spring-context:4.3.4.RELEASE (Proje
    Maven: org.springframework:spring-core:4.3.4.RELEASE (Project l
    Maven: org.springframework:spring-expression:4.3.4.RELEASE (P
    Maven: org.springframework:spring-web:4.3.4.RELEASE (Project L
    Maven: org.springframework:spring-webmvc:4.3.4.RELEASE (Proj
    Maven: org.xerial.snappy:snappy-java:1.1.2.6 (Project Library)
```



Output Layout | Validation | Pre-processing | Post-processing

```
<output root>
  WEB-INF
    classes
      'app_logs_collect_web' compile output
  'app_logs_collect_web' module: 'Web' facet resources
```

☐ Show content of elements

Available Elements ?

```
v app_logs_collect_web
    Maven: com.alibaba:fastjson:1.2.24 (Project Library)
    Maven: com.atguigu:app_common:1.0-SNAPSHOT (Project Library
    Maven: com.fasterxml.jackson.core:jackson-annotations:2.8.0 (Pro
    Maven: com.fasterxml.jackson.core:jackson-core:2.8.8 (Project Lib
    Maven: com.fasterxml.jackson.core:jackson-databind:2.8.3 (Projec
    Maven: com.maxmind.db:maxmind-db:1.0.0 (Project Library)
    Maven: commons-io:commons-io:2.5 (Project Library)
    Ma                                ng:1.2 (Project Library)
    Ma
    Ma                                ary)
    Ma                                ol2:2.4.2 (Project Libra
    Ma                                .2.1 (Project Library)
    Ma                                Library)
    Maven: org.slf4j:slf4j-api:1.7.22 (Project Library)
    Maven: org.slf4j:slf4j-log4j12:1.7.22 (Project Library)
    Maven: org.springframework:spring-aop:4.3.4.RELEASE (Project L
    Maven: org.springframework:spring-beans:4.3.4.RELEASE (Projec
    Maven: org.springframework:spring-context-support:4.3.4.RELEAS
    Maven: org.springframework:spring-context:4.3.4.RELEASE (Proje
    Maven: org.springframework:spring-core:4.3.4.RELEASE (Project l
    Maven: org.springframework:spring-expression:4.3.4.RELEASE (P
    Maven: org.springframework:spring-web:4.3.4.RELEASE (Project L
    Maven: org.springframework:spring-webmvc:4.3.4.RELEASE (Proje
    Maven: org.xerial.snappy:snappy-java:1.1.2.6 (Project Library)
> app_logs_common
> app_statistics_project
```

九 项目总结

1）项目数据基本完整。

2）数据查询没有达到实时，应该将 hive 查询的结果保存到 mysql 数据库中，数据展示服务查询时，可以在 mysql 中查询，提高查询速度。

3）数据展示模块，只做了一组数据的查询，后续可以将所有业务查询都展示到页面上。

4）目前所有业务主要是针对启动日志进行分析，没有对其他 4 种日志进行分析。

5）集群启动关闭，可以采用 shell 脚本。

十 问题总结

1）执行 hive 自定义函数时，报如下错误：

（1）问题描述

```
hive (applogsdb)> select formattime(t.mintime,'yyyy/MM/dd') stdate , count(*) stcount
                > 		from (
                > 			select deviceid,min(createdatms) mintime
                > 			from ext_startup_logs
                > 			  where appid = 'sdk34734' group by deviceid having
mintime >= getweekbegin() and mintime < getweekbegin(1)
                > 		) t
                > 		group by formattime(t.mintime,'yyyy/MM/dd');
WARNING: Hive-on-MR is deprecated in Hive 2 and may not be available in the future
versions. Consider using a different execution engine (i.e. spark, tez) or using Hive 1.X
releases.
Query ID = atguigu_20171108101504_776b483d-2888-4059-a96b-669f7ad18e2e
Total jobs = 2
Launching Job 1 out of 2
Number of reduce tasks not specified. Estimated from input data size: 1
In order to change the average load for a reducer (in bytes):
  set hive.exec.reducers.bytes.per.reducer=<number>
In order to limit the maximum number of reducers:
  set hive.exec.reducers.max=<number>
In order to set a constant number of reducers:
  set mapreduce.job.reduces=<number>
Starting Job = job_1510104352730_0007, Tracking URL =
http://hadoop103:8088/proxy/application_1510104352730_0007/
Kill Command = /opt/module/hadoop-2.7.2/bin/hadoop job  -kill job_1510104352730_0007
Hadoop job information for Stage-1: number of mappers: 0; number of reducers: 1
2017-11-08 10:15:50,492 Stage-1 map = 0%,  reduce = 0%
2017-11-08 10:16:17,854 Stage-1 map = 0%,  reduce = 100%
```

```
Ended Job = job_1510104352730_0007 with errors
Error during job, obtaining debugging information...
Examining task ID: task_1510104352730_0007_r_000000 (and more) from job
job_1510104352730_0007

Task with the most failures(4):
-----
Task ID:
  task_1510104352730_0007_r_000000

URL:

http://hadoop103:8088/taskdetails.jsp?jobid=job_1510104352730_0007&tipid=task_1510104
352730_0007_r_000000
-----
Diagnostic Messages for this Task:
Error: java.lang.RuntimeException: Error in configuring object
        at org.apache.hadoop.util.ReflectionUtils.setJobConf(ReflectionUtils.java:112)
        at org.apache.hadoop.util.ReflectionUtils.setConf(ReflectionUtils.java:78)
        at org.apache.hadoop.util.ReflectionUtils.newInstance(ReflectionUtils.java:136)
        at org.apache.hadoop.mapred.ReduceTask.runOldReducer(ReduceTask.java:409)
        at org.apache.hadoop.mapred.ReduceTask.run(ReduceTask.java:392)
        at org.apache.hadoop.mapred.YarnChild$2.run(YarnChild.java:164)
        at java.security.AccessController.doPrivileged(Native Method)
        at javax.security.auth.Subject.doAs(Subject.java:415)
        at
org.apache.hadoop.security.UserGroupInformation.doAs(UserGroupInformation.java:1657)
        at org.apache.hadoop.mapred.YarnChild.main(YarnChild.java:158)
Caused by: java.lang.reflect.InvocationTargetException
        at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method)
        at
sun.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:57)
        at
sun.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43)
        at java.lang.reflect.Method.invoke(Method.java:606)
        at org.apache.hadoop.util.ReflectionUtils.setJobConf(ReflectionUtils.java:109)
        ... 9 more
Caused by: java.lang.RuntimeException: Reduce operator initialization failed
        at
org.apache.hadoop.hive.ql.exec.mr.ExecReducer.configure(ExecReducer.java:157)
        ... 14 more
Caused by: java.lang.UnsupportedClassVersionError: com/atguigu/hive/FormatTimeUDF :
Unsupported major.minor version 52.0
```

```
            at java.lang.ClassLoader.defineClass1(Native Method)
            at java.lang.ClassLoader.defineClass(ClassLoader.java:800)
            at java.security.SecureClassLoader.defineClass(SecureClassLoader.java:142)
            at java.net.URLClassLoader.defineClass(URLClassLoader.java:449)
            at java.net.URLClassLoader.access$100(URLClassLoader.java:71)
            at java.net.URLClassLoader$1.run(URLClassLoader.java:361)
            at java.net.URLClassLoader$1.run(URLClassLoader.java:355)
            at java.security.AccessController.doPrivileged(Native Method)
            at java.net.URLClassLoader.findClass(URLClassLoader.java:354)
            at java.lang.ClassLoader.loadClass(ClassLoader.java:425)
            at sun.misc.Launcher$AppClassLoader.loadClass(Launcher.java:308)
            at java.lang.ClassLoader.loadClass(ClassLoader.java:358)
            at java.lang.Class.forName0(Native Method)
            at java.lang.Class.forName(Class.java:274)
            at
org.apache.hadoop.hive.ql.udf.generic.GenericUDFBridge.getUdfClassInternal(GenericUDFB
ridge.java:142)
            at
org.apache.hadoop.hive.ql.udf.generic.GenericUDFBridge.initialize(GenericUDFBridge.java:1
54)
            at
org.apache.hadoop.hive.ql.udf.generic.GenericUDF.initializeAndFoldConstants(GenericUDF.j
ava:139)
            at
org.apache.hadoop.hive.ql.exec.ExprNodeGenericFuncEvaluator.initialize(ExprNodeGenericF
uncEvaluator.java:145)
            at
org.apache.hadoop.hive.ql.exec.GroupByOperator.initializeOp(GroupByOperator.java:210)
            at org.apache.hadoop.hive.ql.exec.Operator.initialize(Operator.java:358)
            at org.apache.hadoop.hive.ql.exec.Operator.initialize(Operator.java:546)
            at org.apache.hadoop.hive.ql.exec.Operator.initializeChildren(Operator.java:498)
            at org.apache.hadoop.hive.ql.exec.Operator.initialize(Operator.java:368)
            at org.apache.hadoop.hive.ql.exec.Operator.initialize(Operator.java:546)
            at org.apache.hadoop.hive.ql.exec.Operator.initializeChildren(Operator.java:498)
            at org.apache.hadoop.hive.ql.exec.Operator.initialize(Operator.java:368)
            at org.apache.hadoop.hive.ql.exec.Operator.initialize(Operator.java:546)
            at org.apache.hadoop.hive.ql.exec.Operator.initializeChildren(Operator.java:498)
            at org.apache.hadoop.hive.ql.exec.Operator.initialize(Operator.java:368)
            at
org.apache.hadoop.hive.ql.exec.mr.ExecReducer.configure(ExecReducer.java:150)
            ... 14 more
FAILED: Execution Error, return code 2 from org.apache.hadoop.hive.ql.exec.mr.MapRedTask
MapReduce Jobs Launched:
```

```
Stage-Stage-1: Reduce: 1      HDFS Read: 0 HDFS Write: 0 FAIL
Total MapReduce CPU Time Spent: 0 msec
```

（2）问题原因：原来 hadoop 集群配置的是 jdk1.7 版本，后升级为 jdk1.8。

升级后 HAOOP_HOME 还是配置的 jdk1.7 路径。

（3）问题解决

A)更改：hadoop-env.sh、mapred-env.sh、yarn-env.sh 三个文件中的 HAOOP_HOME。

B)一定要添加 jar 包

```
hive (applogsdb)> add jar /opt/module/hive/lib/app_logs_hive.jar
```