《软件测试》实验五自动化测试报告

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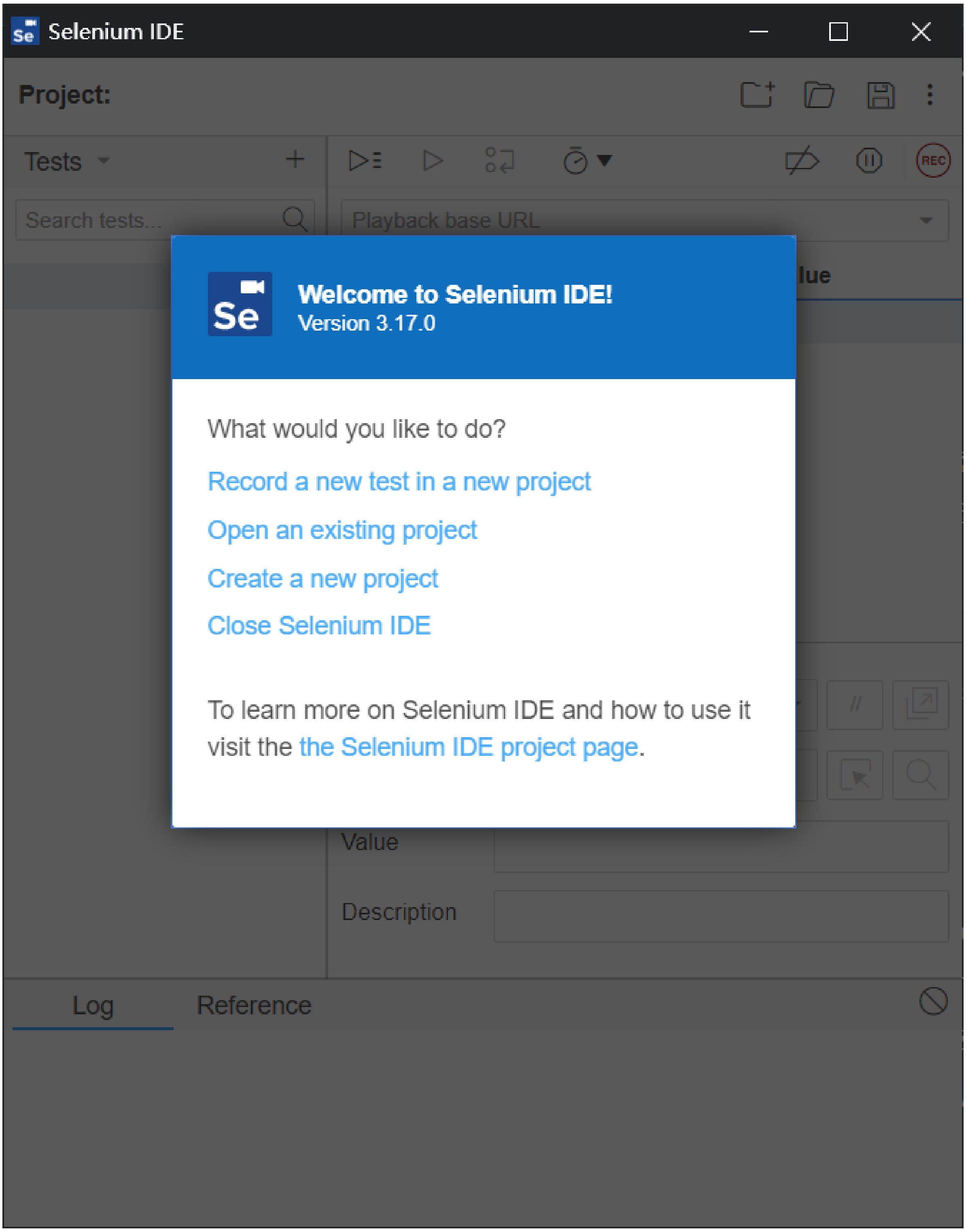
一、实验要求

分别使用Selenium工具和Jmeter工具编写或录制测试脚本，解释 脚本结构，执行脚本，并分析比较两种脚本的差异。

二、实验内容

1.Selenium工具

在Chrome浏览器中添加Selenium IDE插件，可以直接进行脚本录制。



Welcome to Selenium IDE!
Version 3.17.0

What would you like to do?

Record a new test in a new project

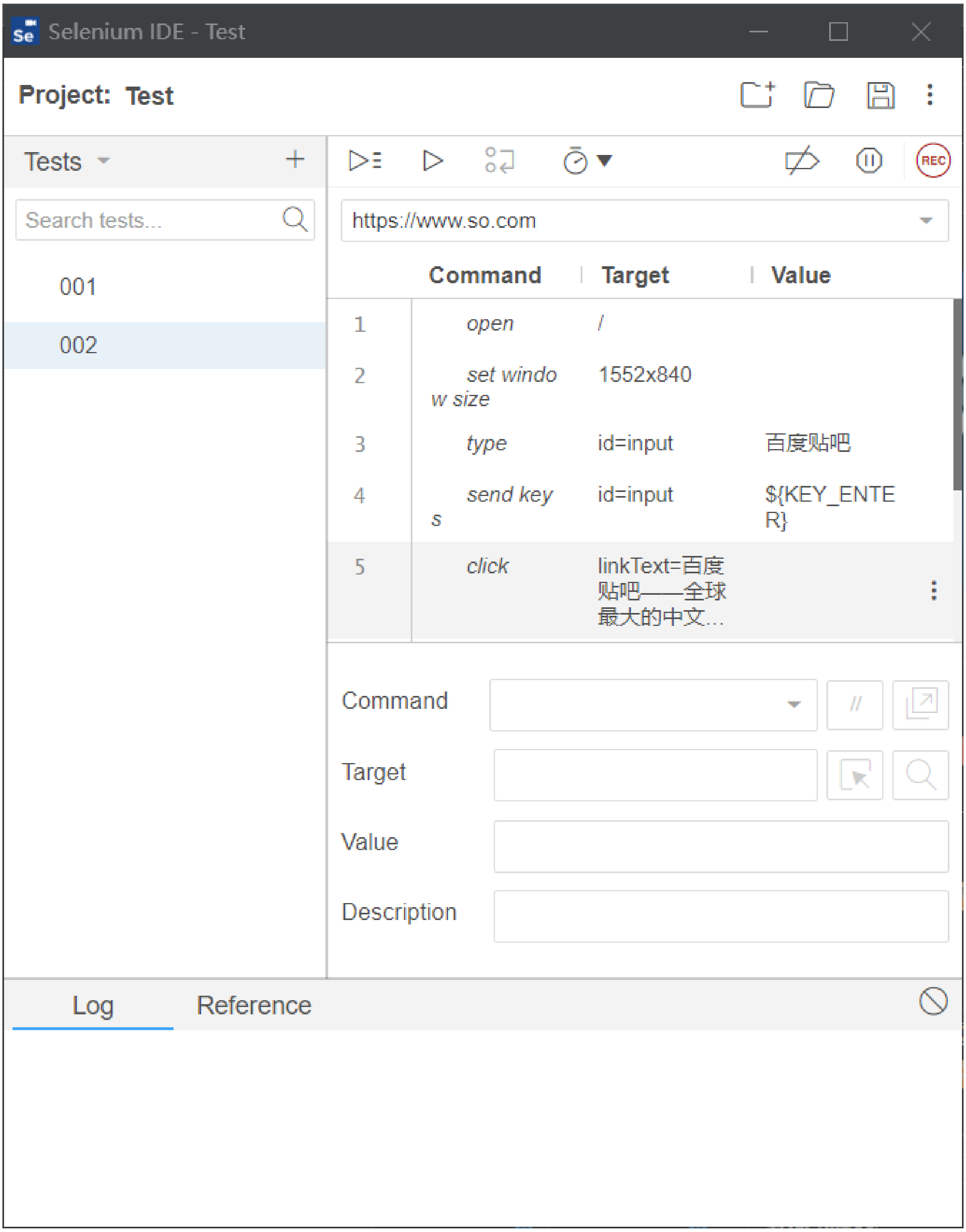
Open an existing project

Create a new project

Close Selenium IDE

To learn more on Selenium IDE and how to use it visit the the Selenium IDE project page.

新建项目进行脚本录制，进入www.so.com，搜索百度贴吧，然后点击第一条搜索结果，结束录制。



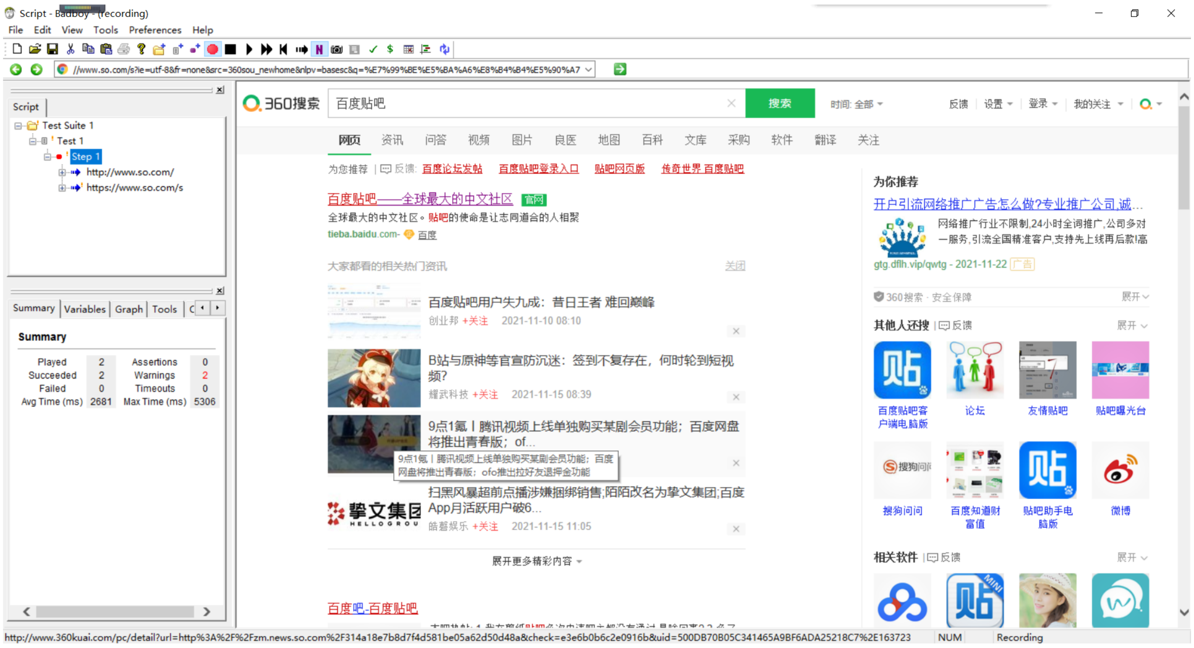
	Command	Target	Value
1	open	/	
2	set window size	1552x840	
3	type	id=input	百度贴吧
4	send keys	id=input	${KEY_ENTER}
5	click	linkText=百度贴吧——全球最大的中文...	

保存脚本为Python格式，导出。

```
# Generated by Selenium IDE
import pytest
import time
import json
from selenium import webdriver
from selenium.webdriver.common.by import By
from selenium.webdriver.common.action_chains import ActionChains
from selenium.webdriver.support import expected_conditions
from selenium.webdriver.support.wait import WebDriverWait
from selenium.webdriver.common.keys import Keys
from selenium.webdriver.common.desired_capabilities import DesiredCapabilities

class Test002():
  def setup_method(self, method):
    self.driver = webdriver.Chrome()
    self.vars = {}

  def teardown_method(self, method):
    self.driver.quit()

  def wait_for_window(self, timeout = 2):
    time.sleep(round(timeout / 1000))
    wh_now = self.driver.window_handles
    wh_then = self.vars["window_handles"]
    if len(wh_now) > len(wh_then):
      return set(wh_now).difference(set(wh_then)).pop()

  def test_002(self):
    self.driver.get("https://www.so.com/")
    self.driver.set_window_size(1552, 840)
    self.driver.find_element(By.ID, "input").send_keys("百度贴吧")
    self.driver.find_element(By.ID, "input").send_keys(Keys.ENTER)
    self.vars["window_handles"] = self.driver.window_handles
    self.driver.find_element(By.LINK_TEXT, "百度贴吧——全球最大的中文社区").click()
    self.vars["win7442"] = self.wait_for_window(2000)
    self.driver.switch_to.window(self.vars["win7442"])
    element = self.driver.find_element(By.CSS_SELECTOR, ".r18f4fbda1 img")
    actions = ActionChains(self.driver)
    actions.move_to_element(element).perform()
    element = self.driver.find_element(By.CSS_SELECTOR, "body")
    actions = ActionChains(self.driver)
    actions.move_to_element(element, 0, 0).perform()
```

2.Badboy+Jmeter工具

用badboy先录制脚本流程

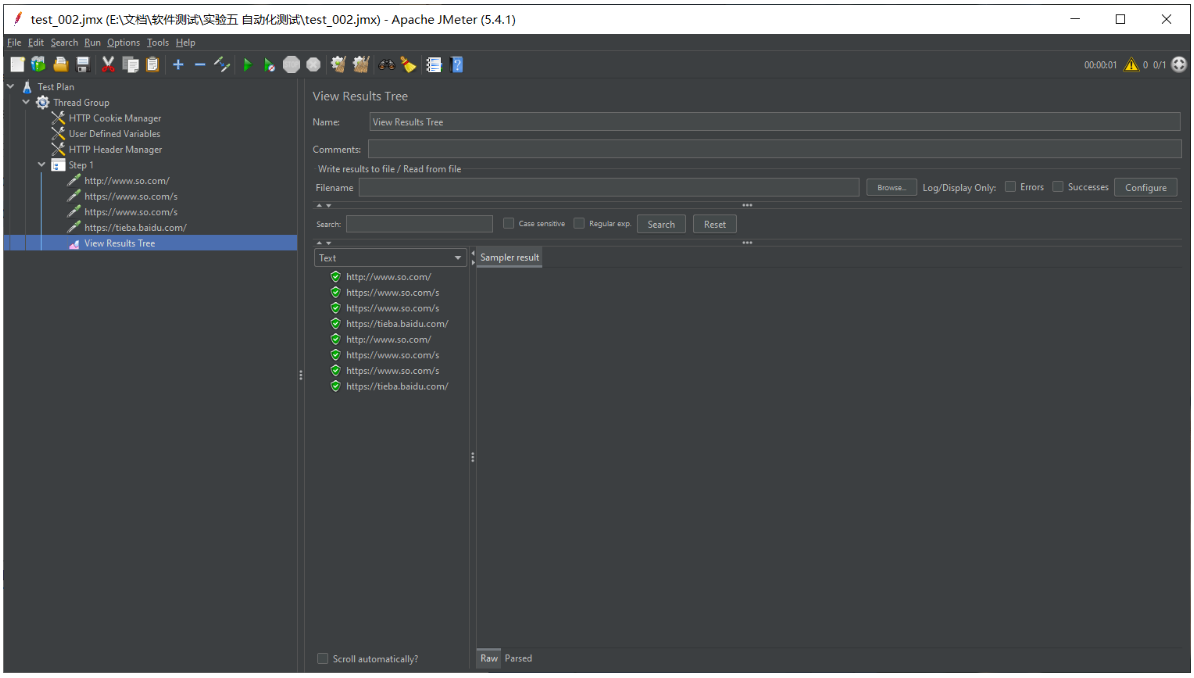

Script - Badboy - (recording)
File Edit View Tools Preferences Help
//www.so.com/s?ie=utf-8&fr=none&src=360sou_newhome&nlpv=basesc&q=%E7%99%BE%E5%BA%A6%E8%B4%B4%E5%90%A7
Script
Test Suite 1
Test 1
Step 1
http://www.so.com/
https://www.so.com/s
Summary Variables Graph Tools
360搜索
百度贴吧
搜索
网页 资讯 问答 视频 图片 良医 地图 百科 文库 采购 软件 翻译 关注
百度贴吧——全球最大的中文社区
百度吧-百度贴吧
为你推荐
其他人还搜
相关软件
NUM
Recording

Summary

Played	2	Assertions	0
Succeeded	2	Warnings	2
Failed	0	Timeouts	0
Avg Time (ms)	2681	Max Time (ms)	5306

然后导出JMX文件，到Jmeter中运行。

导入JMX后，添加结果树，然后运行即可。


test_002.jmx (E:\文档\软件测试\实验五 自动化测试\test_002.jmx) - Apache JMeter (5.4.1)

File Edit Search Run Options Tools Help
00:00:01 ⚠ 0 0/1

- Test Plan
  - Thread Group
    - HTTP Cookie Manager
    - User Defined Variables
    - HTTP Header Manager
    - Step 1
      - http://www.so.com/
      - https://www.so.com/s
      - https://www.so.com/s
      - https://tieba.baidu.com/
    - View Results Tree

View Results Tree

Name: View Results Tree

Comments:

Write results to file / Read from file

Filename

Browse...
Log/Display Only: □ Errors □ Successes
Configure
Search: □ Case sensitive □ Regular exp.
Search
Reset
Text
Sampler result

- ✓ http://www.so.com/
- ✓ https://www.so.com/s
- ✓ https://www.so.com/s
- ✓ https://tieba.baidu.com/
- ✓ http://www.so.com/
- ✓ https://www.so.com/s
- ✓ https://www.so.com/s
- ✓ https://tieba.baidu.com/

JMX代码：

```xml
<?xml version="1.0" encoding="UTF-8"?>
<jmeterTestPlan version="1.2" properties="5.0" jmeter="5.4.1">
  <hashTree>
    <TestPlan guiclass="TestPlanGui" testclass="TestPlan" testname="Test Plan"
enabled="true">
      <stringProp name="TestPlan.comments"></stringProp>
      <boolProp name="TestPlan.functional_mode">false</boolProp>
      <boolProp name="TestPlan.serialize_threadgroups">false</boolProp>
      <elementProp name="TestPlan.user_defined_variables"
elementType="Arguments" guiclass="ArgumentsPanel" testclass="Arguments"
testname="User Defined Variables" enabled="true">
        <collectionProp name="Arguments.arguments"/>
      </elementProp>
      <stringProp name="TestPlan.user_define_classpath"></stringProp>
    </TestPlan>
    <hashTree>
      <ThreadGroup guiclass="ThreadGroupGui" testclass="ThreadGroup"
testname="Thread Group" enabled="true">
        <elementProp name="ThreadGroup.main_controller"
elementType="LoopController" guiclass="LoopControlPanel"
testclass="LoopController" testname="Loop Controller" enabled="true">
          <boolProp name="LoopController.continue_forever">false</boolProp>
          <stringProp name="LoopController.loops">1</stringProp>
        </elementProp>
        <stringProp name="ThreadGroup.num_threads">1</stringProp>
        <stringProp name="ThreadGroup.ramp_time">1</stringProp>
        <longProp name="ThreadGroup.start_time">1281132211000</longProp>
        <longProp name="ThreadGroup.end_time">1281132211000</longProp>
        <boolProp name="ThreadGroup.scheduler">false</boolProp>
        <stringProp name="ThreadGroup.on_sample_error">continue</stringProp>
        <stringProp name="ThreadGroup.duration"></stringProp>
        <stringProp name="ThreadGroup.delay"></stringProp>
        <boolProp name="ThreadGroup.same_user_on_next_iteration">true</boolProp>
      </ThreadGroup>
      <hashTree>
```

```
        <CookieManager guiclass="CookiePanel" testclass="CookieManager"
testname="HTTP Cookie Manager" enabled="true">
          <collectionProp name="CookieManager.cookies"/>
          <boolProp name="CookieManager.clearEachIteration">false</boolProp>
          <boolProp
name="CookieManager.controlledByThreadGroup">false</boolProp>
          <stringProp name="CookieManager.policy">rfc2109</stringProp>
        </CookieManager>
        <hashTree/>
        <Arguments guiclass="ArgumentsPanel" testclass="Arguments"
testname="User Defined Variables" enabled="true">
          <collectionProp name="Arguments.arguments">
            <elementProp name="VIEWSTATE" elementType="Argument">
              <stringProp name="Argument.name">VIEWSTATE</stringProp>
              <stringProp name="Argument.value"></stringProp>
              <stringProp name="Argument.metadata">=</stringProp>
            </elementProp>
            <elementProp name="jsessionid" elementType="Argument">
              <stringProp name="Argument.name">jsessionid</stringProp>
              <stringProp name="Argument.value"></stringProp>
              <stringProp name="Argument.metadata">=</stringProp>
            </elementProp>
          </collectionProp>
        </Arguments>
        <hashTree/>
        <HeaderManager guiclass="HeaderPanel" testclass="HeaderManager"
testname="HTTP Header Manager" enabled="true">
          <collectionProp name="HeaderManager.headers">
            <elementProp name="" elementType="Header">
              <stringProp name="Header.name">User-Agent</stringProp>
              <stringProp name="Header.value">Mozilla/5.0 (compatible; MSIE 9.0;
Windows NT 6.2; WOW64; Trident/7.0)</stringProp>
            </elementProp>
            <elementProp name="" elementType="Header">
              <stringProp name="Header.name">Accept</stringProp>
              <stringProp name="Header.value">image/gif, image/jpeg,
image/pjpeg, application/x-ms-application, application/xaml+xml, application/x-
ms-xbap, */*</stringProp>
            </elementProp>
            <elementProp name="" elementType="Header">
              <stringProp name="Header.name">Accept-Language</stringProp>
              <stringProp name="Header.value">zh-Hans-CN,zh-Hans;q=0.8,en-
US;q=0.6,en;q=0.4,ja;q=0.2</stringProp>
            </elementProp>
          </collectionProp>
        </HeaderManager>
        <hashTree/>
        <LoopController guiclass="LoopControlPanel" testclass="LoopController"
testname="Step 1" enabled="true">
          <boolProp name="LoopController.continue_forever">false</boolProp>
          <stringProp name="LoopController.loops">1</stringProp>
        </LoopController>
        <hashTree>
          <HTTPSamplerProxy guiclass="HttpTestSampleGui"
testclass="HTTPSamplerProxy" testname="http://www.so.com/" enabled="true">
            <elementProp name="HTTPsampler.Arguments" elementType="Arguments"
guiclass="HTTPArgumentsPanel" testclass="Arguments" testname="User Defined
Variables" enabled="true">
```

```
              <collectionProp name="Arguments.arguments"/>
            </elementProp>
            <stringProp name="HTTPSampler.domain">www.so.com</stringProp>
            <stringProp name="HTTPSampler.port">80</stringProp>
            <stringProp name="HTTPSampler.protocol">http</stringProp>
            <stringProp name="HTTPSampler.contentEncoding"></stringProp>
            <stringProp name="HTTPSampler.path">/</stringProp>
            <stringProp name="HTTPSampler.method">GET</stringProp>
            <boolProp name="HTTPSampler.follow_redirects">false</boolProp>
            <boolProp name="HTTPSampler.auto_redirects">true</boolProp>
            <boolProp name="HTTPSampler.use_keepalive">true</boolProp>
            <boolProp name="HTTPSampler.DO_MULTIPART_POST">false</boolProp>
            <stringProp name="HTTPSampler.embedded_url_re"></stringProp>
            <stringProp name="HTTPSampler.implementation">Java</stringProp>
            <stringProp name="HTTPSampler.connect_timeout"></stringProp>
            <stringProp name="HTTPSampler.response_timeout"></stringProp>
          </HTTPSamplerProxy>
          <hashTree/>
          <HTTPSamplerProxy guiclass="HttpTestSampleGui"
testclass="HTTPSamplerProxy" testname="https://www.so.com/s" enabled="true">
            <elementProp name="HTTPsampler.Arguments" elementType="Arguments"
guiclass="HTTPArgumentsPanel" testclass="Arguments" testname="User Defined
Variables" enabled="true">
              <collectionProp name="Arguments.arguments">
                <elementProp name="ie" elementType="HTTPArgument">
                  <boolProp name="HTTPArgument.always_encode">true</boolProp>
                  <stringProp name="Argument.value">utf-8</stringProp>
                  <stringProp name="Argument.metadata">=</stringProp>
                  <boolProp name="HTTPArgument.use_equals">true</boolProp>
                  <stringProp name="Argument.name">ie</stringProp>
                </elementProp>
                <elementProp name="fr" elementType="HTTPArgument">
                  <boolProp name="HTTPArgument.always_encode">true</boolProp>
                  <stringProp name="Argument.value">none</stringProp>
                  <stringProp name="Argument.metadata">=</stringProp>
                  <boolProp name="HTTPArgument.use_equals">true</boolProp>
                  <stringProp name="Argument.name">fr</stringProp>
                </elementProp>
                <elementProp name="src" elementType="HTTPArgument">
                  <boolProp name="HTTPArgument.always_encode">true</boolProp>
                  <stringProp name="Argument.value">360sou_newhome</stringProp>
                  <stringProp name="Argument.metadata">=</stringProp>
                  <boolProp name="HTTPArgument.use_equals">true</boolProp>
                  <stringProp name="Argument.name">src</stringProp>
                </elementProp>
                <elementProp name="nlpv" elementType="HTTPArgument">
                  <boolProp name="HTTPArgument.always_encode">true</boolProp>
                  <stringProp name="Argument.value">basesc</stringProp>
                  <stringProp name="Argument.metadata">=</stringProp>
                  <boolProp name="HTTPArgument.use_equals">true</boolProp>
                  <stringProp name="Argument.name">nlpv</stringProp>
                </elementProp>
                <elementProp name="q" elementType="HTTPArgument">
                  <boolProp name="HTTPArgument.always_encode">true</boolProp>
                  <stringProp name="Argument.value">百度贴吧</stringProp>
                  <stringProp name="Argument.metadata">=</stringProp>
                  <boolProp name="HTTPArgument.use_equals">true</boolProp>
                  <stringProp name="Argument.name">q</stringProp>
                </elementProp>
              </collectionProp>
            </elementProp>
            <stringProp name="HTTPSampler.domain">www.so.com</stringProp>
            <stringProp name="HTTPSampler.port">443</stringProp>
            <stringProp name="HTTPSampler.protocol">https</stringProp>
            <stringProp name="HTTPSampler.contentEncoding"></stringProp>
            <stringProp name="HTTPSampler.path">/s</stringProp>
            <stringProp name="HTTPSampler.method">GET</stringProp>
            <boolProp name="HTTPSampler.follow_redirects">false</boolProp>
            <boolProp name="HTTPSampler.auto_redirects">true</boolProp>
            <boolProp name="HTTPSampler.use_keepalive">true</boolProp>
            <boolProp name="HTTPSampler.DO_MULTIPART_POST">false</boolProp>
            <stringProp name="HTTPSampler.embedded_url_re"></stringProp>
            <stringProp name="HTTPSampler.implementation">Java</stringProp>
            <stringProp name="HTTPSampler.connect_timeout"></stringProp>
            <stringProp name="HTTPSampler.response_timeout"></stringProp>
          </HTTPSamplerProxy>
          <hashTree/>
          <HTTPSamplerProxy guiclass="HttpTestSampleGui" testclass="HTTPSamplerProxy" testname="https://www.so.com/s" enabled="true">
            <elementProp name="HTTPsampler.Arguments" elementType="Arguments" guiclass="HTTPArgumentsPanel" testclass="Arguments" testname="User Defined Variables" enabled="true">
              <collectionProp name="Arguments.arguments">
                <elementProp name="ie" elementType="HTTPArgument">
                  <boolProp name="HTTPArgument.always_encode">true</boolProp>
                  <stringProp name="Argument.value">utf-8</stringProp>
                  <stringProp name="Argument.metadata">=</stringProp>
                  <boolProp name="HTTPArgument.use_equals">true</boolProp>
                  <stringProp name="Argument.name">ie</stringProp>
                </elementProp>
                <elementProp name="fr" elementType="HTTPArgument">
                  <boolProp name="HTTPArgument.always_encode">true</boolProp>
                  <stringProp name="Argument.value">none</stringProp>
                  <stringProp name="Argument.metadata">=</stringProp>
                  <boolProp name="HTTPArgument.use_equals">true</boolProp>
                  <stringProp name="Argument.name">fr</stringProp>
                </elementProp>
                <elementProp name="src" elementType="HTTPArgument">
                  <boolProp name="HTTPArgument.always_encode">true</boolProp>
                  <stringProp name="Argument.value">360sou_newhome</stringProp>
                  <stringProp name="Argument.metadata">=</stringProp>
                  <boolProp name="HTTPArgument.use_equals">true</boolProp>
                  <stringProp name="Argument.name">src</stringProp>
                </elementProp>
                <elementProp name="nlpv" elementType="HTTPArgument">
                  <boolProp name="HTTPArgument.always_encode">true</boolProp>
                  <stringProp name="Argument.value">basesc</stringProp>
                  <stringProp name="Argument.metadata">=</stringProp>
                  <boolProp name="HTTPArgument.use_equals">true</boolProp>
                  <stringProp name="Argument.name">nlpv</stringProp>
                </elementProp>
                <elementProp name="q" elementType="HTTPArgument">
                  <boolProp name="HTTPArgument.always_encode">true</boolProp>
                  <stringProp name="Argument.value">鐗惧害璐村惂</stringProp>
                  <stringProp name="Argument.metadata">=</stringProp>
                  <boolProp name="HTTPArgument.use_equals">true</boolProp>
                  <stringProp name="Argument.name">q</stringProp>
                </elementProp>
              </collectionProp>
            </elementProp>
            <stringProp name="HTTPSampler.domain">www.so.com</stringProp>
            <stringProp name="HTTPSampler.port">443</stringProp>
            <stringProp name="HTTPSampler.protocol">https</stringProp>
            <stringProp name="HTTPSampler.contentEncoding"></stringProp>
            <stringProp name="HTTPSampler.path">/s</stringProp>
            <stringProp name="HTTPSampler.method">GET</stringProp>
            <boolProp name="HTTPSampler.follow_redirects">false</boolProp>
            <boolProp name="HTTPSampler.auto_redirects">true</boolProp>
            <boolProp name="HTTPSampler.use_keepalive">true</boolProp>
            <boolProp name="HTTPSampler.DO_MULTIPART_POST">false</boolProp>
            <stringProp name="HTTPSampler.embedded_url_re"></stringProp>
            <stringProp name="HTTPSampler.implementation">Java</stringProp>
            <stringProp name="HTTPSampler.connect_timeout"></stringProp>
            <stringProp name="HTTPSampler.response_timeout"></stringProp>
          </HTTPSamplerProxy>
          <hashTree/>
          <HTTPSamplerProxy guiclass="HttpTestSampleGui"
testclass="HTTPSamplerProxy" testname="https://tieba.baidu.com/" enabled="true">
            <elementProp name="HTTPsampler.Arguments" elementType="Arguments"
guiclass="HTTPArgumentsPanel" testclass="Arguments" testname="User Defined
Variables" enabled="true">
              <collectionProp name="Arguments.arguments"/>
            </elementProp>
            <stringProp name="HTTPSampler.domain">tieba.baidu.com</stringProp>
            <stringProp name="HTTPSampler.port">443</stringProp>
            <stringProp name="HTTPSampler.protocol">https</stringProp>
            <stringProp name="HTTPSampler.contentEncoding"></stringProp>
            <stringProp name="HTTPSampler.path">/</stringProp>
            <stringProp name="HTTPSampler.method">GET</stringProp>
            <boolProp name="HTTPSampler.follow_redirects">false</boolProp>
            <boolProp name="HTTPSampler.auto_redirects">true</boolProp>
            <boolProp name="HTTPSampler.use_keepalive">true</boolProp>
            <boolProp name="HTTPSampler.DO_MULTIPART_POST">false</boolProp>
            <stringProp name="HTTPSampler.embedded_url_re"></stringProp>
            <stringProp name="HTTPSampler.implementation">Java</stringProp>
            <stringProp name="HTTPSampler.connect_timeout"></stringProp>
            <stringProp name="HTTPSampler.response_timeout"></stringProp>
          </HTTPSamplerProxy>
          <hashTree/>
          <ResultCollector guiclass="ViewResultsFullVisualizer"
testclass="ResultCollector" testname="View Results Tree" enabled="true">
            <boolProp name="ResultCollector.error_logging">false</boolProp>
            <objProp>
              <name>saveConfig</name>
              <value class="SampleSaveConfiguration">
                <time>true</time>
                <latency>true</latency>
                <timestamp>true</timestamp>
                <success>true</success>
                <label>true</label>
                <code>true</code>
                <message>true</message>
                <threadName>true</threadName>
                <dataType>true</dataType>
                <encoding>false</encoding>
                <assertions>true</assertions>
                <subresults>true</subresults>
                <responseData>false</responseData>
                <samplerData>false</samplerData>
                <xml>false</xml>
                <fieldNames>true</fieldNames>
                <responseHeaders>false</responseHeaders>
                <requestHeaders>false</requestHeaders>
                <responseDataOnError>false</responseDataOnError>

 <saveAssertionResultsFailureMessage>true</saveAssertionResultsFailureMessage>
                <assertionsResultsToSave>0</assertionsResultsToSave>
                <bytes>true</bytes>
                <sentBytes>true</sentBytes>
                <url>true</url>
                <threadCounts>true</threadCounts>
                <idleTime>true</idleTime>
                <connectTime>true</connectTime>
              </value>
            </objProp>
            <stringProp name="filename"></stringProp>
          </ResultCollector>
          <hashTree/>
        </hashTree>
      </hashTree>
    </hashTree>
  </hashTree>
</jmeterTestPlan>
```

三、脚本对比

Selenium的是Python脚本，结构清晰，容易理解，易于直接编写脚本驱动测试；而Jmeter的JMX是XML格式的，十分难以理解，不易编写，一个操作往往需要数十行代码，不过其数据存储较方便。

四、实验总结

本次实验学会了如何利用脚本对目标测试对象进行自动化测试，学习了Selenium和Jmeter两种方法。自动化测试可以大大便利重复繁琐的工作。