

# Web Service programming

*Lab1 of Special Topics on Services Computing*

## 黑龙江省哈尔滨地区生活指南

最后更新: 2014-12-12 21:35:41

### 今日概况

12月12日 多云

- 气温: -23°C/-17°C
- 风向和风力: 西风微风
- 天气趋势: ☁转☀
- 今日天气实况: 气温: -22°C 风向: 西风 微风 风速: 10km/h 露点: -27°C 湿度: 75% 气压: 1012 hPa
- 生活指数:

太阳镜指数: 不需要。

风大天冷, 有较强降雪。

雪中驾驶安全提示: 注意路面湿滑。

驾车出行提示: 冷天大风。

户外锻炼提示: 不需要。

- 穿衣指数:
- 今日紫外线指数: 强: -55
- 感冒指数: 一般

```
Last login: Fri Dec 12 21:53:46 on ttys000
[22:14:18] Xivid:~ $ python /Users/Xivid/
请输入您的客户的手机号: 13029990587
您的客户来自黑龙江省哈尔滨市。
已将该地的生活指南保存在 result.html 中。
[22:14:39] Xivid:~ $
```

Yang Zhifei  
12/12/2014

# Experiment 1

## Course Grade Query

12/11/2014

This part is the solution for the first two requirements in the lab manual.

### I. Requirement Analysis & Web Service Designing

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As is required in the manual, we need to deploy a server with access to the course grade database. Given a course name and a student ID, the grade the student scored on that course should be returned. A client should be implemented to invoke the course grade query service provided by the server and tell the grade.

This should be very easy to accomplish using *soaplib* as a similar example is given, which includes a client sending the server a string **name** and a number **times**, as well as a server receiving these two parameters and returning a list with **times names**.

### II. Programming Implementation & Deployment

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I just modified the example to achieve the goal. The function **say\_hello** in the server is replaced by **getGrade**, which receives a String **name**(name of the

Condition	Result
Student not found	"No such student."
Course not found	"No such course."
Success	id + name + grade, e.g. `1130310217 English 100'

course) and an Integer **id**(identification of the student), and returns a String **result**. Below is the table for the content of **result**, which depends on whether the course or student exists:

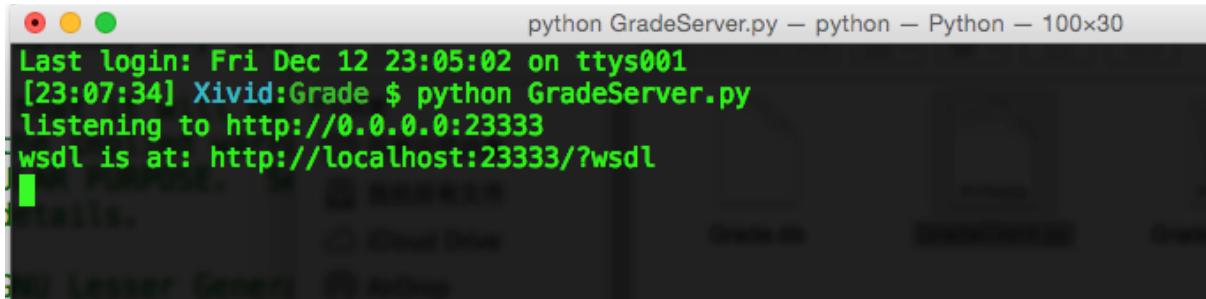
Grade data is managed by sqlite3, saved in the file ‘Grade.db’. I imported sqlite3 package for Python to query from the database in the program.

To avoid conflict, this server serves on an rarely-used localhost port 23333. For the client, I just added a try-catch block to avoid illegal arguments. The client invokes the **CourseGradeService** at <http://localhost:23333/?wsdl>, sends **name** and **id**, and get the result.

### III. Invocation process && Screenshots

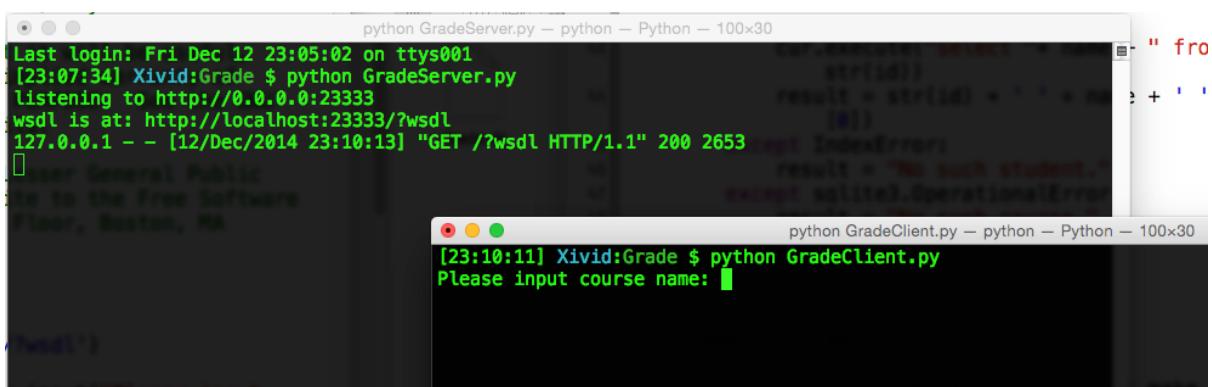
---

As is done in the screenshot, to invoke this service, the server *GradeServer.py* should be run at first. It starts a process listening to <http://0.0.0.0:23333>(which refers to the port 23333 on local host).



```
Last login: Fri Dec 12 23:05:02 on ttys001
[23:07:34] Xivid:Grade $ python GradeServer.py
listening to http://0.0.0.0:23333
wsdl is at: http://localhost:23333/?wsdl
```

Then run the client *GradeClient.py* in another terminal. It sends a GET request to get the WSDL at launch, as is shown below.

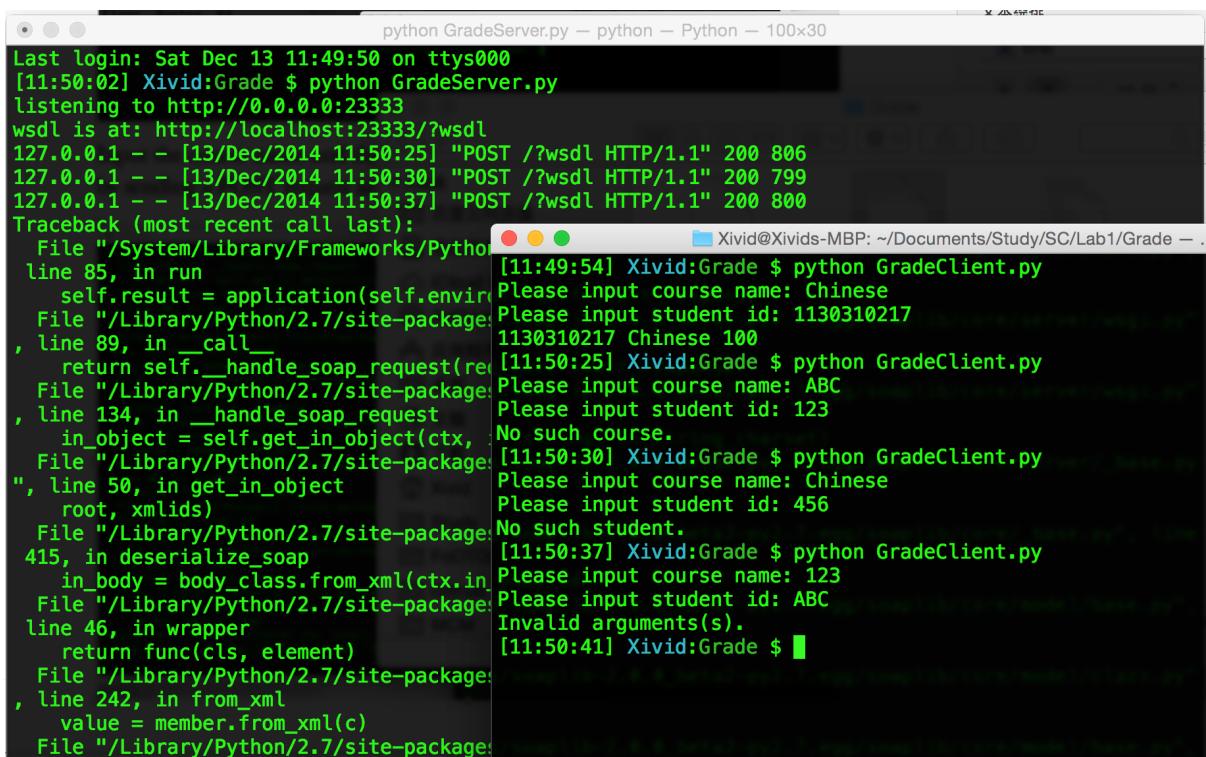


```
Last login: Fri Dec 12 23:05:02 on ttys001
[23:07:34] Xivid:Grade $ python GradeServer.py
listening to http://0.0.0.0:23333
wsdl is at: http://localhost:23333/?wsdl
127.0.0.1 - - [12/Dec/2014 23:10:13] "GET /?wsdl HTTP/1.1" 200 2653
```

```
[23:10:11] Xivid:Grade $ python GradeClient.py
Please input course name: Chinese
```

Input the course name and the student id in the client, and we will get the result by sending a POST request and getting the response.



```
Last login: Sat Dec 13 11:49:50 on ttys000
[11:50:02] Xivid:Grade $ python GradeServer.py
listening to http://0.0.0.0:23333
wsdl is at: http://localhost:23333/?wsdl
127.0.0.1 - - [13/Dec/2014 11:50:25] "POST /?wsdl HTTP/1.1" 200 806
127.0.0.1 - - [13/Dec/2014 11:50:30] "POST /?wsdl HTTP/1.1" 200 799
127.0.0.1 - - [13/Dec/2014 11:50:37] "POST /?wsdl HTTP/1.1" 200 800
```

```
Traceback (most recent call last):
  File "/System/Library/Frameworks/Python.framework/Versions/2.7/lib/python2.7/site-packages/zeep/wsdl/bindings/soap.py", line 85, in run
    self.result = application(self.environment)
  File "/Library/Python/2.7/site-packages/zeep/wsdl/bindings/soap.py", line 134, in __call__
    return self.__handle_soap_request(request)
  File "/Library/Python/2.7/site-packages/zeep/wsdl/bindings/soap.py", line 50, in get_in_object
    in_object = self.get_in_object(ctxt, root, xmlids)
  File "/Library/Python/2.7/site-packages/zeep/wsdl/bindings/soap.py", line 415, in deserialize_soap
    in_body = body_class.from_xml(ctxt.in_header)
  File "/Library/Python/2.7/site-packages/zeep/wsdl/bindings/soap.py", line 46, in wrapper
    return func(cls, element)
  File "/Library/Python/2.7/site-packages/zeep/wsdl/bindings/soap.py", line 242, in from_xml
    value = member.from_xml(element)
  File "/Library/Python/2.7/site-packages/zeep/wsdl/bindings/soap.py", line 11, in from_xml
    raise InvalidArgument("Invalid arguments(s).")
```

```
[11:49:54] Xivid:Grade $ python GradeClient.py
Please input course name: Chinese
Please input student id: 1130310217
1130310217 Chinese 100
[11:50:25] Xivid:Grade $ python GradeClient.py
Please input course name: ABC
Please input student id: 123
No such course.
[11:50:30] Xivid:Grade $ python GradeClient.py
Please input course name: Chinese
Please input student id: 456
No such student.
[11:50:37] Xivid:Grade $ python GradeClient.py
Please input course name: 123
Please input student id: ABC
Invalid arguments(s).
[11:50:41] Xivid:Grade $
```

# Experiment 2

Communication Helper

12/12/2014

This part is the solution for the third requirement in the lab manual - combination of web services.

## I. Web Service Design

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This app is a client, designed to help users communicate with whoever he is talking to via mobile phone more easily and pleasantly, by giving guides and introductions to the client's location.

The client uses three web services provided in [http://www.webxml.com.cn/zh\\_cn/web\\_services.aspx](http://www.webxml.com.cn/zh_cn/web_services.aspx): MobileCodeWS, WeatherWebService and ChinaZipSearchWebService. My service accepts a mobile phone number as input, get the number's corresponding province and city via MobileCodeWS, then invoke WeatherWebService and ChinaZipSearchWebService for the life guide and zip code of that city. Information are shown in an HTML document, well designed using Markdown.

## II. Programming

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This client is composed by four functions: getLocation, getGuide, getZipCode and WriteToFile:

### 1. getLocation

This function receives a phone number **phonenum** and invokes MobileCodeWS web service to get the corresponding location. The return value is encoded in UTF-8.

The WSDL file is fetched from <http://webservice.webxml.com.cn/WebServices/MobileCodeWS.asmx?wsdl>.

### 2. getGuide

This function receives a parameter **city**, invokes WeatherWebService for the weather and life guide information. It returns an **ArrayOfString** instance.

The WSDL file is fetched from <http://webservice.webxml.com.cn/WebServices/WeatherWebService.asmx?wsdl>. XMLSchema is manually

specified at <http://www.w3.org/2001/XMLSchema>, otherwise suds would throw an exception.

### 3. getZipCode

This function receives two parameters **province** and **city**, invokes ChinaZipSearchWebService web service to get the zip code(s) for that area. It returns a string(with content ‘<ul><li>...</li>...</ul>’), which is represented as a unordered list in HTML.

The WSDL file is fetched from <http://webservice.webxml.com.cn/WebServices/ChinaZipSearchWebService.asmx?wsdl>. XMLSchema is manually specified at <http://www.w3.org/2001/XMLSchema>, otherwise suds would throw an exception.

### 4. WriteToFile

This function writes the result **r** into result.html, replacing all ‘%os’s in the document one by one. Weather information will also be represented as icons.

This Python script asks for a mobile phone number **input**, invokes `getLocation(input)` for **location**, which is a tuple made up by province(at index 0) and city(at index 1), then invokes `getGuide(location[1])` for **guide** and `getZipCode(location[0], location[1])` for **zipcode**. All results are encoded in UTF-8 and saved in a list **result**, which will be sent to `WriteToFile(result)` to render **result.html** as output. To end with, the program opens the document with OS-default web browser.

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## III. Deployment

This app is deployed locally. We can just run the script in a terminal, do the input, and the result will be shown automatically.

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## IV. Invocation Process

Users must have a Python shell environment with **suds** installed. Internet access is also required. To run this application, change to directory **CommHelper** and run **python query.py** in a shell. Input the client’s mobile phone number, and wait for the result. A web browser should be opened automatically to show **result.html**, if not, open it manually.

Next is an example for one run. It takes about 10 seconds to get all data.

```

Xivid@Xivid-MBP: ~/Documents/Study/SC/Lab1/CommHelper
Last login: Sat Dec 13 12:50:37 on console
[16:02:52] Xivid:CommHelper $ python query.py
请输入您的客户的手机号: 13029990587
您的客户来自黑龙江省哈尔滨市。
已将该地的生活指南保存在 result.html 中。
[16:03:25] Xivid:CommHelper $ 

```

**黑龙江省哈尔滨地区生活指南**

最后更新: 2014-12-13 15:56:27

### 今日概况

12月13日 多云

- 气温: -26°C/-17°C
- 风向和风力: 西北风3-4级转西风微风
- 天气趋势:  转 
- 今日天气实况: 气温: -17°C; 风向/风力: 西风 2级; 温度: 47%; 空气质量: 良好; 紫外线强度: 弱
- 生活指数:

太阳镜指数: 需要。白天天空晴朗, 请适时佩戴太阳镜。穿衣指数: 寒冷。建议着厚羽绒服等隆冬服装。旅游指数: 较不宜。风大寒冷, 需有选择性的进行出游。运动指数: 较不宜。天气寒冷, 推荐您进行室内运动。洗车指数: 较适宜。无雨且风力较小, 易保持清洁度。化妆指数: 保湿。请选择滋润保湿型化妆品。感冒指数: 较易发。天较凉, 增加衣服, 注意防护。空气污染指数: 良好。紫外线指数: 弱。辐射较弱, 涂擦SPF12-15、PA+护肤品。舒适度指数: 极不舒适。白天晴, 气温低, 十分寒冷, 注意保暖。

### 天气预报

12月14日 晴转多云

- 气温: -25°C/-16°C
- 风向和风力: 西风转东南风微风
- 天气趋势:  转 

12月15日 小雪转阵雪

- 气温: -21°C/-12°C
- 风向和风力: 东风转东北风3-4级
- 天气趋势:  转 

### 城市介绍

哈尔滨市是黑龙江省省会, 位于黑龙江省西南部, 地处东经126°38', 北纬45°45', 是全省政治、经济、文化、科技和交通中心, 也是全国省会城市中面积最大的城市。全市辖7个区、12个县(市)。哈尔滨历史悠久, 是中国金、清两代王朝的发祥地。其古时为满族祖先女真族村落, 19世纪末, 随着国内外移民大量定居, 哈尔滨成为中国北方较为发达的工商业城市。哈尔滨是一个多民族聚集的地区, 居民以汉族为多, 此外还居住着满、回、蒙古、朝鲜等40多个民族。哈尔滨的气候属中温带大陆性季风气候, 冬长夏短, 有“冰城”之称, 是旅游和避暑胜地。走进哈尔滨, 滑雪场、狩猎场、自然风景区、林海雪原...处处都可以感受到哈尔滨清新、自然的气息。哈尔滨人文历史悠久, 奥林匹克北方少数民族历史文化化于一身, 融合中外文化精要于一城。文庙、极乐寺、西方古典建筑、造型奇特的东正教、天主教、基督教的教堂, 将市区装扮得多么多彩。市内建筑中西合璧, 格调鲜明的各种建筑, 艺术复兴式、巴洛克式、拜占庭式等精典之作比比皆是, 使人仿佛置身于中世纪的欧洲, 充满浓郁的异国风情和民族风俗。特别是欧式建筑汇集的中央大街, 雅洁明快的建筑色调, 尽显繁华如锦的都市风貌。一年一度的“哈尔滨之夏”音乐会, “冰雪节”中的国际冰雕雪塑比赛, 以及“国际经贸洽谈会”, 处处折射出“东方小巴黎”的独特魅力。

### 邮政编码

**天气预报**

12月14日 晴转多云

- 气温: -25°C/-16°C
- 风向和风力: 西风转东南风微风
- 天气趋势:  转 

12月15日 小雪转阵雪

- 气温: -21°C/-12°C
- 风向和风力: 东风转东北风3-4级
- 天气趋势:  转 

### 城市介绍

哈尔滨市是黑龙江省省会, 位于黑龙江省西南部, 地处东经126°38', 北纬45°45', 是全省政治、经济、文化、科技和交通中心, 也是全国省会城市中面积最大的城市。全市辖7个区、12个县(市)。哈尔滨历史悠久, 是中国金、清两代王朝的发祥地。其古时为满族祖先女真族村落, 19世纪末, 随着国内外移民大量定居, 哈尔滨成为中国北方较为发达的工商业城市。哈尔滨是一个多民族聚集的地区, 居民以汉族为多, 此外还居住着满、回、蒙古、朝鲜等40多个民族。哈尔滨的气候属中温带大陆性季风气候, 冬长夏短, 有“冰城”之称, 是旅游和避暑胜地。走进哈尔滨, 滑雪场、狩猎场、自然风景区、林海雪原...处处都可以感受到哈尔滨清新、自然的气息。哈尔滨人文历史悠久, 奥林匹克北方少数民族历史文化化于一身, 融合中外文化精要于一城。文庙、极乐寺、西方古典建筑、造型奇特的东正教、天主教、基督教的教堂, 将市区装扮得多么多彩。市内建筑中西合璧, 格调鲜明的各种建筑, 艺术复兴式、巴洛克式、拜占庭式等精典之作比比皆是, 使人仿佛置身于中世纪的欧洲, 充满浓郁的异国风情和民族风俗。特别是欧式建筑汇集的中央大街, 雅洁明快的建筑色调, 尽显繁华如锦的都市风貌。一年一度的“哈尔滨之夏”音乐会, “冰雪节”中的国际冰雕雪塑比赛, 以及“国际经贸洽谈会”, 处处折射出“东方小巴黎”的独特魅力。

### 邮政编码

- 三姓七道街: 150000
- 阿什河街: 150000
- 鞍山街: 150001
- 巴陵街: 150001
- 巴山街: 150001
- 保安街: 150001
- 北京街: 150001
- 比乐街: 150001
- 崇德街: 150001
- 第四方圆里: 150001
- 第五方圆里: 150001
- 电动街: 150001
- 电工街: 150001
- 电源街: 150001
- 东大直街 31-120号: 150001
- 段家胡同: 150001
- 二方园里: 150001
- 分部街: 150001
- 奋斗路: 150001
- 崇乐街: 150001