UNIVERSITY OF LEEDS	School of Computing University of Leeds **Coursework 2 - Answers**	**Module Code** **COMP3211**

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Coursework Title: Web services
Deadline Date: 22/11/2019

Question 1 (4 marks)

Web service No. 1	*Fill in this table*
Name	REST COUNTRIES
SOAP-based or RESTful	RESTful
Name of publisher	REST COUNTRIES
Brief description	The api returns information of the required country. Information retrieved is in json format containing population, demonym, capital, latlng and many more. We fetch the capital of the selected country by parsing the JSON format.
URL	https://restcountries.eu/rest/v2/name/Spain

Web service No. 2	*Fill in this table in case you have considered 3 Web services*
Name	Weatherstack
SOAP-based or RESTful	RESTful
Name of publisher	Weatherstack
Brief description	The RESTful api provides current weather conditions for a given city. We consider the current temperature for a capital city which we receive from the 1st web service.
URL	http://api.weatherstack.com/current?access_key=07a27e7c5eac1a83378e327935d003bb&query=Madrid

Web service No. 3	*Provide the details of the Web service YOU have developed*
Name	Places2Visit
SOAP-based or RESTful	RESTful
Brief description	The api recommends places to visit in the capital city based on current weather conditions.

Composition of Originality (10 marks)

Provide details in the table below.

Web Service	**Input**	**Output**	**Output Parsing**
1	Name of the country	Capital of the country	JSON

2	Name of the capital city and auth key	Current weather condition	JSON
3	Current weather condition of the Capital, Capital of the country	Recommended places to visit in the city.	Output is displayed in text format.

Implementation details

Web Service 1 (8 marks)

Explain how it is invoked. You may include relevant snippet of source code

Using a web page, user is asked to choose a country where he is willing to travel. Once the user submits the choice, 'REST COUNTRIES' Web Service is accessed using an URL. Selected country is passed as a parameter. The Web Service returns data in JSON format containing population, demonym, capital, latlng and many more as shown in **Fig,1**. Further, the JSON is parsed to retrieve Capital of the country.

Include evidence of its execution through a client, e.g. screen shot

```
127.0.0.1 - - [19/Nov/2019 23:31:37] "GET / HTTP/1.1" 200 -
API response for 1st Web Service: [{'name': 'Australia',
'topLevelDomain': ['.au'], 'alpha2Code': 'AU', 'alpha3Code': 'AUS',
'callingCodes': ['61'], 'capital': 'Canberra', 'altSpellings':
['AU'], 'region': 'Oceania', 'subregion': 'Australia and New
Zealand', 'population': 24117360, 'latlng': [-27.0, 133.0],
'demonym': 'Australian', 'area': 7692024.0, 'gini': 30.5,
'timezones': ['UTC+05:00', 'UTC+06:30', 'UTC+07:00', 'UTC+08:00',
'UTC+09:30', 'UTC+10:00', 'UTC+10:30', 'UTC+11:30'], 'borders': [],
'nativeName': 'Australia', 'numericCode': '036', 'currencies':
[{'code': 'AUD', 'name': 'Australian dollar', 'symbol': '$'}],
'languages': [{'iso639_1': 'en', 'iso639_2': 'eng', 'name':
'English', 'nativeName': 'English'}], 'translations': {'de':
'Australien', 'es': 'Australia', 'fr': 'Australie', 'ja': 'オーストラリ
ア', 'it': 'Australia', 'br': 'Austrália', 'pt': 'Austrália', 'nl':
'Australië', 'hr': 'Australija', 'fa': 'استرالیا'}, 'flag':
'https://restcountries.eu/data/aus.svg', 'regionalBlocs': [],
'cioc': 'AUS'}]
127.0.0.1 - - [19/Nov/2019 23:31:40] "POST /select HTTP/1.1" 200 -
```

Fig 1.

Web Service 2 (8 marks)

Explain how it is invoked. You may include relevant snippet of source code if you wish

Weatherstack Web Service is used to access current weather information for a city. The Capital received from Web Service 1 is used as a parameter to 2nd Web Service. The api returns weather status for the Capital in JSON format. Temperature, wind-speed, humidity, cloud cover, weather descriptions are few statistics obtained from the api as shown in **Fig.2**. We fetch the current temperature to decide the current weather

scenario (Sunny, Winter) and weather description to inform the user about the present weather.

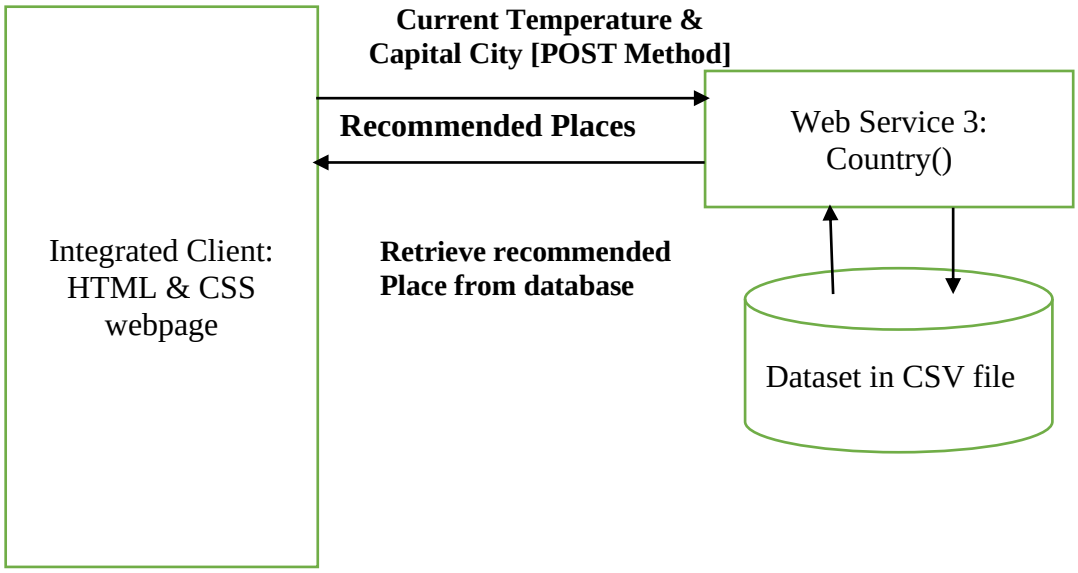
Include evidence of its execution through a client, e.g. screen shot

```
127.0.0.1 - - [19/Nov/2019 23:33:50] "POST /select HTTP/1.1" 200 -
API response for 2nd Web Service: {'request': {'type': 'City', 'query': 'Canberra, Australia', 'language':
'en', 'unit': 'm'}, 'location': {'name': 'Canberra', 'country': 'Australia', 'region': 'Australian Capital
Territory', 'lat': '-35.283', 'lon': '149.217', 'timezone_id': 'Australia/Sydney', 'localtime': '2019-11-20
10:28', 'localtime_epoch': 1574245680, 'utc_offset': '11.0'}, 'current': {'observation_time': '11:28 PM',
'temperature': 19, 'weather_code': 113, 'weather_icons': ['https://assets.weatherstack.com/images/
wsymbols01_png_64/wsymbol_0001_sunny.png'], 'weather_descriptions': ['Sunny'], 'wind_speed': 9, 'wind_degree':
330, 'wind_dir': 'NNW', 'pressure': 1017, 'precip': 0, 'humidity': 49, 'cloudcover': 0, 'feelslike': 19,
'uv_index': 5, 'visibility': 10, 'is_day': 'yes'}}
```

Fig 2.

Web Service 3 – This is YOUR Web service (20 marks)

Explain its design



Client is accessing the api using HTML webpage. Using a POST method, the form data is stored in a variable called 'country'**.** Desired country is further used in accessing 1st api. Once we receive capital of the country from Web service 1, we get current weather conditions using Web service 2. In 3rd Web Service, backend is accessed using read_csv() method and stored in data frame. Utilizing the outputs of Web service 2, IF-Else conditions are used to derive the desired output. Render Template is used to render HTML files and display out to user through a webpage.

Explain its implementation

The Places2Visit api recommends user two most famous places to visit in the Capital of the selected Country. It suggests tourist destination according to the current weather condition. The api uses name of the capital from 1st Web Service and its corresponding current weather condition from 2nd Web Service as two input parameters. If the temperature is equal or below 15 degree Celsius, it recommends places to visit during winter. On the other hand, if the temperature is above 15 degree Celsius it proposes destinations which are favourable to summer conditions. Data regarding tourist places are saved in a csv file which is copied in pandas data frame 'df' using read method. The current weather description, name of the Capital and list

of places to visit are displayed using a web page. The HTML file is rendered through render_template() method.

Explain how it is invoked. You may include relevant snippet of source code

Once the user submits the desired country, an action associated with the button is executed as shown in **Fig.3.** Further, based on the action the built-in wrapper i.e. app.route() routes the control to the correct logic function. The function retrieves input parameters using two api and passes them to logic which subsequently recommends the famous places.

```
}
</style>
<body>
<h2><font size="5" color="white"><u> Select the Country to visit </u></font></h2>
<form id="select" action="/select" method="POST" enctype="multipart/form-data" position:center-left>
    <br>
    <select id="mySelect" name = "country">
      <option value="Australia">Australia(Canberra)</option>
      <option value="Spain">Spain(Madrid)</option>
      <option value="United States of America"> United States of America(Washington D.C)</option>

    </select>

    <button class="button button" type="submit" value="Submit">Submit</button>
  </form>

</body>
</html>
```

Fig.3

Include evidence of its execution through a client, e.g. screen shot

Fig.4

Integration / User Interface (10 marks)

Provide details of the Web services integration

A HTML webpage is used to gather user input. User input is retrieved using request.form.get() method. The country is passed as input in web service 1 and the out is parsed to get the Capital. Further, the Capital city is used as input for Web Service 2. The results are obtained in JSON format which is parsed to obtain current weather conditions such as temperature and weather description. Another HTML webpage is used to display results of Web service 3.

Provide details of your Web-based application (Servlets/JSP/Other Frameworks)
Flask framework is used to interface HTML and CSS web pages with backend python server. Once we execute the python code, Flask invokes local host on which the web application is running. An instance of Flask i.e. app is created to invoke functions. The app.route() method maps to the functions which executes for the URL. HTML webpages are stored in Templates folder which are rendered to front end using render_template () function.

Successful Execution (10 marks)

Include evidence of the Web services integration execution, e.g. screen shot

Web Page 1:

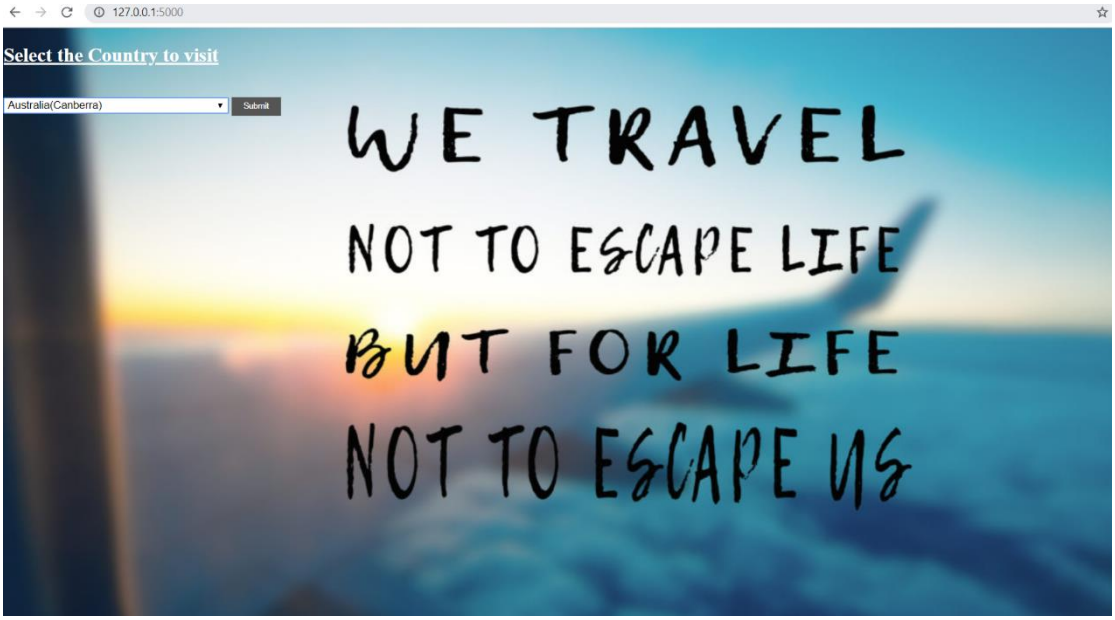


Fig.5

Web Page 2:

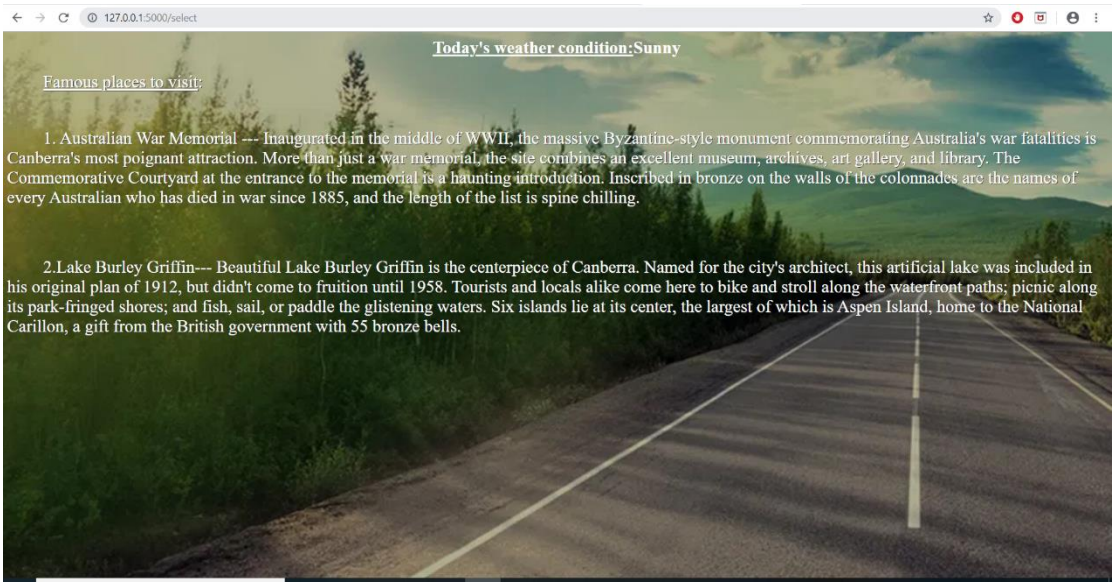


Fig.6

Other Comments