Project 2:

Web Client

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Contents

I. Project Preview

- Make a Simple Web Client with any Language
- You have to handle message received from Auto marking Web server.
- You have to know how to handle Restful methods. We'll handle GET, POST and http client header.
- HTTP request header format is must be same as below.
  Student Number/Name/Program name/Subject
- Test your WebClient by using Auto marking (URL : http://52.79.241.196:1919/index.html , Passwd:COMNET2018)

II. Code Explanation

webClient.java

```
1  package webClient;
2
3  import java.awt.image.BufferedImage;
10
11
12 public class webClient {
13     public static void main(String[] args) throws IOException {
14         String buffer;
15         Scanner scanner=new Scanner(System.in);
16         String u1=scanner.nextLine();
17         buffer = getWebContentByGet(u1, "UTF-8", 2000);
18         System.out.println(buffer);
19         String data = "2016024902/"+scanner.nextLine();
20         String u2=scanner.nextLine();//picReesult
21         buffer = getWebContentByPost(u2, data, "UTF-8", 2000);
22         System.out.println(buffer);
23         String u3=scanner.nextLine();
24         String s2=getWebContentByPost(u3, "2016024902", "UTF-8", 2000);
25         System.out.println(s2);
26     }
27     public static String getWebContentByGet(String urlString, final String charset, int timeout) throws IOException{
28         if (urlString == null || urlString.length() == 0){
29             return null;
30         }
31         urlString = (urlString.startsWith("http://")||urlString.startsWith("https://")) ? urlString
32                 : ("http://"+urlString).intern();
33         URL url =new URL(urlString);
34         HttpURLConnection conn = (HttpURLConnection) url.openConnection();
35         conn.setRequestMethod("GET");
36         conn.setRequestProperty("User-Agent",
37                 "2016024902/SERYOUNGYOON/WebClient/ComputerNetwork");
38         conn.setRequestProperty("Accept", "text/html");
39         conn.setConnectTimeout(timeout);
40         try{
41             if (conn.getResponseCode() != HttpURLConnection.HTTP_OK){
42                 return null;
43             }
44         }catch (IOException e){
45             e.printStackTrace();
46             return null;
47         }
48         InputStream input = conn.getInputStream();
49         BufferedReader reader = new BufferedReader(new InputStreamReader(input,charset));
50         String line = null;
51         StringBuffer sb = new StringBuffer();
52         while ((line = reader.readLine()) != null){
53             sb.append(line).append("\r\n");
54         }
55         if (reader != null){
56             reader.close();
57         }
58         if(conn != null){
59             conn.disconnect();
60         }
61         return sb.toString();
62         }
```

- Main()

Enter the url through Scanner and execute get and post method in order. The results are configured to be stored in the buffer immediately after execution. The original post method will be proceed in the form of enter url first then input the number of picResult, but in my code, I reversed the order of input parameters.

- getWebContentByGet (String urlString, final String charset, int timeout)

Change the USER-AGENT's header according to the right form . The most part of code is implemented by reffering to sample code.

```java
    public static String getWebContentByPost(String urlString, String data, final String charset, int timeout) throws IOException{
        if (urlString == null || urlString.length() == 0){
            return null;
        }
        urlString = (urlString.startsWith("http://") || urlString.startsWith("https://")) ? urlString
                : ("http://" + urlString).intern();
        URL url = new URL(urlString);
        HttpURLConnection connection = (HttpURLConnection) url.openConnection();
        connection.setDoOutput(true);
        connection.setDoInput(true);
        connection.setRequestMethod("POST");
        connection.setUseCaches(false);
        connection.setInstanceFollowRedirects(true);
        connection.setRequestProperty("Content-Type", "text/html;charset=UTF-8");
        connection.setRequestProperty("User-Agent", "2016024902/SERYOUNGYOON/WebClient/ComputerNetwork");
        connection.setRequestProperty("Accept", "*/*");
        connection.setConnectTimeout(timeout);
        connection.connect();
        DataOutputStream out = new DataOutputStream(connection.getOutputStream());
        byte[] content = data.getBytes("UTF-8");
        out.write(content);
        out.flush();
        out.close();
        try {
            if (connection.getResponseCode() != HttpURLConnection.HTTP_OK)
                return null;
        } catch (IOException e) {
            e.printStackTrace();
            return null;
        }
        BufferedReader reader = new BufferedReader(new InputStreamReader(connection.getInputStream(), charset));
        String line=null;
        StringBuffer sb = new StringBuffer();
        while ((line = reader.readLine()) != null)
            sb.append(line).append("\r\n");
        if (reader != null)
            reader.close();
        if (connection != null)
            connection.disconnect();
        return sb.toString();
        }
}
```

- getWebContentByPost (String urlString, String data, final String charset, int timeout)

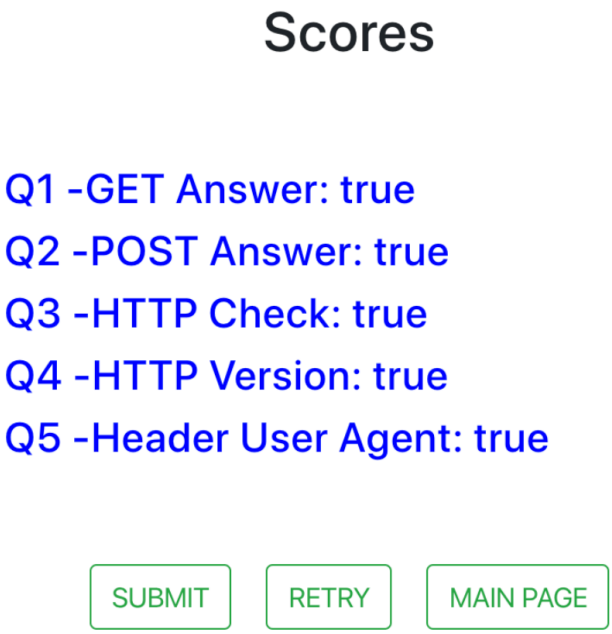
Change the USER-AGENT's header according to the right form , and try-catch part is set as same as get method.

III. Instructions

Approach 166.104.143.225/index through my web browser. Next move to "Computer Network" and click "Go Test". Then Fill in the blanks. Then it will show you two missions.

1. Fix user-agent in http header as Student "Number/Name/Program name/Subject"
2. Send get method to server that you are assigned and answer how many picture you received. Send Post request to http://166.104.143.225:Assigned Port/test/postHandleTest

IV. Program Operating & Results




```
<terminated> webClient [Java Application] /Library/Java/JavaVirtualMachines/jdk-12.0.2.jdk/Contents/Home/bin/java (Nov 13, 2019, 4:58:12 PM)
http://52.79.241.196:53927/test/index.html
<html>
 <head>
  <title>Sub Testing Server</title>
 </head>
 <body>
  <table>
   <tbody>
    <tr>
     <th>*Student Number   </th>
     <th>*Access Web Client IP Address   </th>
     <th>*Access Web Client Port   </th>
    </tr>
    <tr>
     <td id="sno">2016024902</td>
     <td id="sip">/218.235.241.52</td>
     <td id="sport">51359</td>
    </tr>
   </tbody>
  </table>
  <br>
  <br>
  <img id="image1" src="null" width="250" height="150" alt="">
  <img id="image2" src="null.jpg" width="250" height="150" alt="">
  <img id="image3" src="index/images/3.jpg" width="250" height="150" alt="">
  <img id="image4" src="null.jpg" width="250" height="150" alt="">
  <img id="image5" src="index/images/5.jpg" width="250" height="150" alt="">
  <img id="image6" src="null.jpg" width="250" height="150" alt="">
  <img id="image7" src="null.jpg" width="250" height="150" alt="">
  <img id="image8" src="index/images/8.jpg" width="250" height="150" alt="">
  <img id="image9" src="index/images/9.jpg" width="250" height="150" alt="">
  <img id="image10" src="null.jpg" width="250" height="150" alt="">
  <img id="image11" src="null.jpg" width="250" height="150" alt="">
  <img id="image12" src="index/images/12.jpg" width="250" height="150" alt="">
  <img id="image13" src="null.jpg" width="250" height="150" alt="">
  <img id="image14" src="null.jpg" width="250" height="150" alt="">
  <img id="image15" src="null.jpg" width="250" height="150" alt="">
  <img id="image16" src="null.jpg" width="250" height="150" alt="">
  <br>
  <br>
  <p> </p>
  <form action="result.html" method="Post">
   <div>
    <label>How many Picture did you receive??</label>
    <input type="text" name="stuAnswer">
    <input type="Submit" value="submit">
   </div>
   <h3>******Notice******</h3>
   <h3>If you are only using Command Line, send your answer to use the Post method to "Server Address:Port(that you assigned)/test/picResult"</h3>
   <input type="hidden" name="sno1" id="hiddenfield" value="2016024902">
  </form>
  <p></p>
 </body>
```

```
5
http://52.79.241.196:53927/test/picResult
<html>
 <head>
 </head>
 <body>
  <table>
   <tbody>
    <tr>
     <th>*Student Number   </th>
     <th>*Access Web Client IP Address   </th>
     <th>*Access Web Client Port   </th>
    </tr>
    <tr>
     <td id="sno">2016024902</td>
     <td id="sip">/218.235.241.52</td>
     <td id="sport">51360</td>
    </tr>
   </tbody>
  </table>
  <div>
   <h2 id="sentPic" style="color:blue">Correct: I sent you 5 pictures</h2>
  </div>
  <div>
   <h2 id="ansPic">You answered that you received 5 pictures</h2>
  </div>
  <br>
  <br>
  <br>
  <div>
   <h1>About your header</h1>
  </div>
  <div id="headerTest"> Accept=[*/*]
   <br>Connection=[keep-alive]
   <br>Host=[52.79.241.196:53927]
   <br>Pragma=[no-cache]
   <br>User-agent=[2016024902/SERYOUNGYOON/WebClient/ComputerNetwork]
   <br>Content-type=[text/html;charset=UTF-8]
   <br>Content-length=[12]
   <br>Cache-control=[no-cache]
   <br>
  </div>
  <div>
   <h2 id="warning"></h2>
  </div>
 </body>
</html>

http://52.79.241.196:53927/test/postHandleTest
4034205777
```

Step5. Check your Result

***Your Information**

Student Name	Student Number	Web Client IP	Web Client Port	Access Time	Score
SERYOUNG+YOON	2016024902	172.20.10.3	8888	2019-11-13 04:59:30	75/100

From Mission1 to Mission3 is essential Requirements

Mission Index	Result	Comment
Mission 1: Set header-Useragent(HEADER)	true	
Mission2: Answer Number of Pictures(GET)	true	
Mission3: Select Correct Number(POST)	true	
Optional: Select Correct Picture(GET, DataStructure, UI)	false	To check the image, you have to implement your client with GUI OR save it as .jpg file after receive

V. My Opinion

The process of requesting and receiving a response directly from the Web server was interesting. I wanted to implement GUI-which is an optional task, but I regret that it was not completed due to lack of time. I'll have to give it a try personally.