

Assignment 1

CS532, Web Science, Spring 2017
Old Dominion University, Computer Science Dept

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Question 1:

Demonstrate that you know how to use “curl” well enough to correctly POST data to a form. Show that the HTML response that is returned is “correct”. That is, the server should take the arguments you POSTed and build a response accordingly. Save the HTML response to a file and then view that file in a browser and take a screen shot.

Answer:

To post data to a form using “curl” command, we need to use the “-X POST” option, and then add the option “-F” for each “field=value” in the form we want to post to.

Example:

Let's print HTML form a page using “curl”. This page “index.html” is created for test purpose. It makes it possible to post data using a web browser:

Listing 1: Command:

```
root@ima-app:/var/www/Hussam# curl http://www.cs.odu.edu/~hhallak/532/A1/Q1/index.html
```

Listing 2: Output: The content of index.html

```
<html>
<body>
<form action="welcome.php" method="post">
Name: <input type="text" name="name"><br>
E-mail: <input type="text" name="email"><br>
<input type="submit">
</form>
</body>
</html>
```

The page “welcome.php” expects data to be posted, name and email. Let's see what it looks like without data posted to it. The Superglobal array \$_POST should be empty:

Listing 3: Command:

```
root@ima-app:/var/www/Hussam# curl www.cs.odu.edu/~hhallak/532/A1/Q1/welcome.php
```

Listing 4: Output: The output of welcome.php

```
<html>
<body>
Array()
</body>
</html>
```

Note: The code we use to print out the elements of the Superglobal array \$_POST is what we see if we open “welcome.php” in a code editor:

Listing 5: The content of welcome.php

```
<html>
<body>
<?php print_r ($_POST); ?>
</body>
</html>
```

Now it's time to use “curl” command to post data to the page “welcome.php” and see how it works. The Superglobal array \$_POST should contain our data that we posted:

Listing 6: Command:

```
root@ima-app:/var/www/Hussam# curl -X POST -F 'name=Hussam' -F 'email=me@hussam.us'
http://www.cs.odu.edu/~hhallak/532/A1/Q1/welcome.php
```

Listing 7: Output: The output of welcome.php

```
<html>
<body>
Array
(
    [name] => Hussam
    [email] => me@hussam.us
)
</body>
</html>
```

Now let's save our response to a file. We can easily do that by adding “-o” option, and add the name of the file where we want to save the response, to our previous “curl” command: **Note:** If the option “-O” is used, that is UPPERCASE O, there is no need to add a file name after it; the response will be saved to a file with the same page name.

Listing 8: Command:

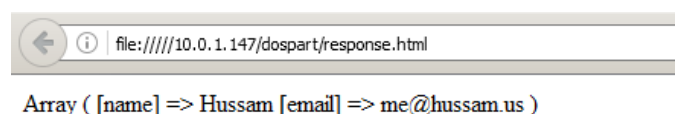
```
root@ima-app:/var/www/Hussam# curl -X POST -o response.html -F 'name=Hussam' -F
'email=me@hussam.us' http://www.cs.odu.edu/~hhallak/532/A1/Q1/welcome.php
```

Listing 9: Output:

```
% Total    % Received % Xferd Average Speed Time   Time     Time Current
                         Dload  Upload  Total   Spent    Left  Speed
100  348    0   97  100   251    999   2586 --:--:-- --:--:-- --:--:-- 3691
root@ima-app:/var/www/Hussam# ls
response.html
```

We can clearly see that the response is saved to a file named “response.html”.

Figure 1: Screenshot of The file response.html opened in a web browser



Included Files:

index.html, welcome.php, response.html, screen_shot.png, session.txt

Question 2:

Write a Python program that:

1. Takes as a command line argument a web page
2. Extracts all the links from the page
3. Lists all the links that result in PDF files, and prints out the bytes for each of the links.
(note: be sure to follow all the redirects until the link terminates with a “200 OK”.)
4. show that the program works on 3 different URIs, one of which needs to be:
<http://www.cs.odu.edu/~mln/teaching/cs532-s17/test/pdfs.html>

Answer:

Listing 10: The content of extractPDF.py

```
import sys
from bs4 import *
import urllib2
import re
if len(sys.argv) != 2:
    print "Usage: Python extracrPDF.py <url>"
    print "e.g: Python extracrPDF.py http://example.com/page.html"
else:
    url = sys.argv[1]
    print "Entered URL:"
    print url
    html_page = urllib2.urlopen(url)
    print "Final URL:"
    print html_page.geturl()
    print "*****"
    soup = BeautifulSoup(html_page, "html.parser")
    links = []
    for link in soup.findAll('a', attrs={'href': re.compile("^http://")}):
        links.append(link.get('href'))
    for link in links:
        try:
            r = urllib2.urlopen(link)
            if r.headers['content-type'] == "application/pdf" and r.getcode() == 200:
                print "Extracted link:"
                print link
                print "Extracted link final URL:"
                print r.geturl()
                print "Size: " + r.headers['Content-Length']
                print "-----"
        except urllib2.HTTPError as e:
            print "There is an error extracting PDF files in this link:"
            print "Error Code:"
            print e.code
```

Running the program:

The program takes a link as a command line argument. It follows all the redirects until it terminates with a "200 OK". Then it begins to extract all links to PDF files and prints the PDF link, the final destination for the link, and file size.

First Test Case:

Let's test the link:

`http://hussam.us`

The link above is redirected to the link:

`http://www.cs.odu.edu/~hhallak/`

This page: `http://www.cs.odu.edu/~hhallak/` does not contain any links to PDF documents.

Listing 11: Command:

```
root@ima-app:/var/www/Hussam# python extractPDF.py http://hussam.us
```

Listing 12: Output:

```
Entered URL:
http://hussam.us
Final URL:
http://www.cs.odu.edu/~hhallak/
*****
```

Required Test Case:

`http://www.cs.odu.edu/~mln/teaching/cs532-s17/test/pdfs.html`

Listing 13: Command:

```
root@ima-app:/var/www/Hussam# python extractPDF.py
http://www.cs.odu.edu/~mln/teaching/cs532-s17/test/pdfs.html
```

Listing 14: Output:

```
Entered URL:
http://www.cs.odu.edu/~mln/teaching/cs532-s17/test/pdfs.html
Final URL:
http://www.cs.odu.edu/~mln/teaching/cs532-s17/test/pdfs.html
*****
Extracted link:
http://www.cs.odu.edu/~mln/pubs/ht-2015/hypertext-2015-temporal-violations.pdf
Extracted link final URL:
http://www.cs.odu.edu/~mln/pubs/ht-2015/hypertext-2015-temporal-violations.pdf
Size: 2184076
-----
Extracted link:
http://www.cs.odu.edu/~mln/pubs/tpdl-2015/tpdl-2015-annotations.pdf
Extracted link final URL:
http://www.cs.odu.edu/~mln/pubs/tpdl-2015/tpdl-2015-annotations.pdf
Size: 622981
-----
Extracted link:
http://arxiv.org/pdf/1512.06195
Extracted link final URL:
```

<https://arxiv.org/pdf/1512.06195.pdf>
Size: 1748961

Extracted link:

<http://www.cs.odu.edu/~mln/pubs/tpdl-2015/tpdl-2015-off-topic.pdf>

Extracted link final URL:

<http://www.cs.odu.edu/~mln/pubs/tpdl-2015/tpdl-2015-off-topic.pdf>

Size: 4308768

Extracted link:

<http://www.cs.odu.edu/~mln/pubs/tpdl-2015/tpdl-2015-stories.pdf>

Extracted link final URL:

<http://www.cs.odu.edu/~mln/pubs/tpdl-2015/tpdl-2015-stories.pdf>

Size: 1274604

Extracted link:

<http://www.cs.odu.edu/~mln/pubs/tpdl-2015/tpdl-2015-profiling.pdf>

Extracted link final URL:

<http://www.cs.odu.edu/~mln/pubs/tpdl-2015/tpdl-2015-profiling.pdf>

Size: 639001

Extracted link:

<http://www.cs.odu.edu/~mln/pubs/jcdl-2014/jcdl-2014-brunelle-damage.pdf>

Extracted link final URL:

<http://www.cs.odu.edu/~mln/pubs/jcdl-2014/jcdl-2014-brunelle-damage.pdf>

Size: 2205546

Extracted link:

<http://bit.ly/1ZDatNK>

Extracted link final URL:

<http://www.cs.odu.edu/~mln/pubs/jcdl-2015/jcdl-2015-temporal-intention.pdf>

Size: 720476

Extracted link:

<http://www.cs.odu.edu/~mln/pubs/jcdl-2015/jcdl-2015-mink.pdf>

Extracted link final URL:

<http://www.cs.odu.edu/~mln/pubs/jcdl-2015/jcdl-2015-mink.pdf>

Size: 1254605

Extracted link:

<http://www.cs.odu.edu/~mln/pubs/jcdl-2015/jcdl-2015-arabic-sites.pdf>

Extracted link final URL:

<http://www.cs.odu.edu/~mln/pubs/jcdl-2015/jcdl-2015-arabic-sites.pdf>

Size: 709420

Extracted link:

<http://www.cs.odu.edu/~mln/pubs/jcdl-2015/jcdl-2015-dictionary.pdf>

Extracted link final URL:

<http://www.cs.odu.edu/~mln/pubs/jcdl-2015/jcdl-2015-dictionary.pdf>

Size: 2350603

Additional Test Case:

<http://www.cs.odu.edu/~hhallak/pdfs/index.html>

Listing 15: Command:

```
root@ima-app:/var/www/Hussam# python extractPDF.py
http://www.cs.odu.edu/~hhallak/pdfs/index.html
```

Listing 16: Output:

```
Entered URL:
http://www.cs.odu.edu/~hhallak/pdfs/index.html
Final URL:
http://www.cs.odu.edu/~hhallak/pdfs/index.html
*****
Extracted link:
http://www.cs.odu.edu/~hhallak/pdfs/A4.pdf
Extracted link final URL:
http://www.cs.odu.edu/~hhallak/pdfs/A4.pdf
Size: 191976
-----
Extracted link:
http://www.cs.odu.edu/~hhallak/pdfs/cs772A2.pdf
Extracted link final URL:
http://www.cs.odu.edu/~hhallak/pdfs/cs772A2.pdf
Size: 2036216
-----
Extracted link:
http://www.cs.odu.edu/~hhallak/pdfs/cs772all.pdf
Extracted link final URL:
http://www.cs.odu.edu/~hhallak/pdfs/cs772all.pdf
Size: 1297575
-----
Extracted link:
http://www.cs.odu.edu/~hhallak/pdfs/des-s-boxes.pdf
Extracted link final URL:
http://www.cs.odu.edu/~hhallak/pdfs/des-s-boxes.pdf
Size: 90917
-----
Extracted link:
http://www.cs.odu.edu/~hhallak/pdfs/hashes_message_digests.pdf
Extracted link final URL:
http://www.cs.odu.edu/~hhallak/pdfs/hashes_message_digests.pdf
Size: 126965
-----
Extracted link:
http://www.cs.odu.edu/~hhallak/pdfs/introduction_authentication.pdf
Extracted link final URL:
http://www.cs.odu.edu/~hhallak/pdfs/introduction_authentication.pdf
Size: 50308
-----
Extracted link:
http://www.cs.odu.edu/~hhallak/pdfs/introduction_cryptography.pdf
Extracted link final URL:
http://www.cs.odu.edu/~hhallak/pdfs/introduction_cryptography.pdf
Size: 55243
-----
Extracted link:
```

http://www.cs.odu.edu/~hhallak/pdfs/introduction_general.pdf
Extracted link final URL:
http://www.cs.odu.edu/~hhallak/pdfs/introduction_general.pdf
Size: 26124

Extracted link:
http://www.cs.odu.edu/~hhallak/pdfs/introduction_openssl.pdf
Extracted link final URL:
http://www.cs.odu.edu/~hhallak/pdfs/introduction_openssl.pdf
Size: 33765

Extracted link:
<http://www.cs.odu.edu/~hhallak/pdfs/kerberos.pdf>
Extracted link final URL:
<http://www.cs.odu.edu/~hhallak/pdfs/kerberos.pdf>
Size: 30051

Extracted link:
<http://www.cs.odu.edu/~hhallak/pdfs/lectures.pdf>
Extracted link final URL:
<http://www.cs.odu.edu/~hhallak/pdfs/lectures.pdf>
Size: 31128

Extracted link:
<http://www.cs.odu.edu/~hhallak/pdfs/Number Theory.pdf>
Extracted link final URL:
<http://www.cs.odu.edu/~hhallak/pdfs/Number Theory.pdf>
Size: 145137

Extracted link:
<http://www.cs.odu.edu/~hhallak/pdfs/openssl.pdf>
Extracted link final URL:
<http://www.cs.odu.edu/~hhallak/pdfs/openssl.pdf>
Size: 15481

Extracted link:
http://www.cs.odu.edu/~hhallak/pdfs/pem_smime.pdf
Extracted link final URL:
http://www.cs.odu.edu/~hhallak/pdfs/pem_smime.pdf
Size: 36764

Extracted link:
http://www.cs.odu.edu/~hhallak/pdfs/PKI_Certificates.pdf
Extracted link final URL:
http://www.cs.odu.edu/~hhallak/pdfs/PKI_Certificates.pdf
Size: 47536

Extracted link:
<http://www.cs.odu.edu/~hhallak/pdfs/Primes.pdf>
Extracted link final URL:
<http://www.cs.odu.edu/~hhallak/pdfs/Primes.pdf>
Size: 149857

Extracted link:
http://www.cs.odu.edu/~hhallak/pdfs/secret_key_cryptography.pdf

Extracted link final URL:
http://www.cs.odu.edu/~hhallak/pdfs/secret_key_cryptography.pdf
Size: 692743

Extracted link:
http://www.cs.odu.edu/~hhallak/pdfs/security_handshake.pdf
Extracted link final URL:
http://www.cs.odu.edu/~hhallak/pdfs/security_handshake.pdf
Size: 58099

Extracted link:
http://www.cs.odu.edu/~hhallak/pdfs/ssl_https.pdf
Extracted link final URL:
http://www.cs.odu.edu/~hhallak/pdfs/ssl_https.pdf
Size: 49048

Extracted link:
http://www.cs.odu.edu/~hhallak/pdfs/ssl_programming.pdf
Extracted link final URL:
http://www.cs.odu.edu/~hhallak/pdfs/ssl_programming.pdf
Size: 52201

Included Files:

extractPDF.py, README

Question 3:

Consider the “bow-tie” graph in the Broder et al. paper (fig 9): <http://www9.org/w9cdrom/160/160.html>

Now consider the following graph:

A \rightarrow B
B \rightarrow C
C \rightarrow D
C \rightarrow A
C \rightarrow G
E \rightarrow F
G \rightarrow C
G \rightarrow H
I \rightarrow H
I \rightarrow K
L \rightarrow D
M \rightarrow A
M \rightarrow N
N \rightarrow D
O \rightarrow A
P \rightarrow G

For the above graph, give the values for: IN, SCC, OUT, Tendrils, Tubes, Disconnected.

Answer:

IN: O, M, P

SCC: A, B, C G

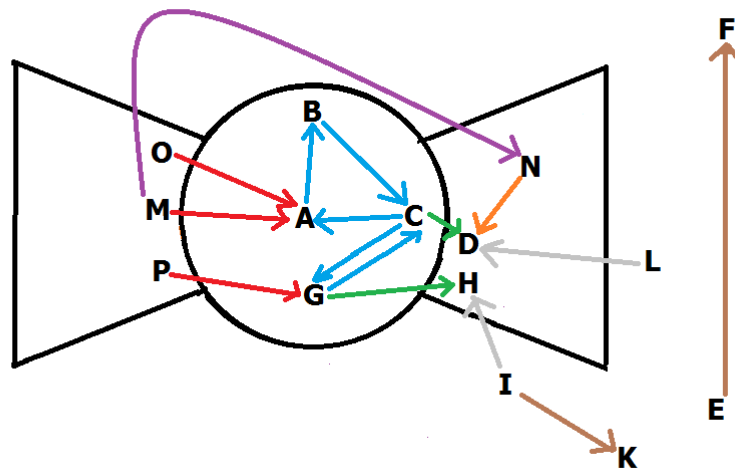
OUT: H, D, N

Tendrils: I, K, L

Tubes: there is one tube from M to N ($M \rightarrow N$).

Disconnected: E, F [h]

Figure 2: Bowtie graph



Included Files:

bowtie.png

References

- [1] Python For Beginners. Available from World Wide Web:(<http://www.pythonforbeginners.com/>).
- [2] Cambridge University Press. Available from World Wide Web: (<http://nlp.stanford.edu/IR-book/html/htmledition/the-web-graph-1.html>).