

Assignment 1

CS532-s16: Web Sciences

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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 form using `curl` we must first consult the man pages to see what options are available.

From the man pages of `curl`:

```
-d, --data <data>
    (puHTTP) Sends the specified data in a POST request to the HTTP
    server, in the same way that a browser does when a user has
    filled in an HTML form and presses the submit button. This will
    cause curl to pass the data to the server using the content-type
    application/x-www-form-urlencoded. Compare to -F, --form.
```

The man pages of `curl` state it can be used to post data to a form using this syntax:

```
curl -d "formValX=x&formValY=y" http://www.someform.com
```

From my recent work with the WS-DL tool `mink` I believe we can use `curl` send a uri to WebCite for archival using this command:

```
curl -I -d "url=http://docs.python-requests.org/en/latest/&email=
jberlin@cs.odu.edu" http://webcitation.org/archive
```

The `curl` commands posts and we receive the following response:

```
HTTP/1.1 200 OK
Date: Thu, 28 Jan 2016 01:40:12 GMT
Server: Apache/2.0.63 (Unix) mod_ssl/2.0.63 OpenSSL/0.9.8e-fips-
      rhel5 mod_auth_passthrough/2.1 mod_bwlimited/1.4 PHP/5.2.9
X-Powered-By: PHP/5.2.9
Content-Length: 5993
Content-Type: text/html
```

The form that was used is shown in Figure 1

WebCite archive page - Mozilla Firefox

WebCite archive page x

www.webcitation.org/archive

READPAPERS schoolSites Most Visited Getting Started JSHint Documentation From Google Chrome conspiracy streams NO CLEAN SINGING Chegg Tu

[HOME | FAQ | NEWS | APPLY | MEMBERS | SEARCH | COMB | ARCHIVE | BOOKMARKLET]

WebCite® archive form

This page allows you to submit a single URL for instant archiving with WebCite®, a member of the International Internet Preservation Consortium. Archiving in WebCite® allows anybody (particularly authors) to create a stable version of a Web page (including Blogs, Wiki, PDF file, and other webdocuments), making it "citable" in an academic context. It also provides the cited author and the academic community with WebCite®.

The content of the page requested below will be immediately archived, including any inline images and / or media (up to a maximum size). WebCite® automatically determines if the webpage is already archived. As part of the archiving process, an e-mail will be sent to the address of the citing author below, containing the unique URL that can be used to access the archived content, which should be used for any other purposes than sending a confirmation or failure email.

URL to Archive [url]:

Your (citing author) E-mail Address [email]:

Language of archived file:

Please select in which language you want the website to be archived, we will then try to archive the webpage in that language. (Default website language is used when preferred language is not available.)

Metadata (optional)

These are Dublin Core elements. Entering these will help you to correctly cite the URL. Any information here will take precedence over metadata extracted from the cited webpage.

Title [title]:

Author(s) [author]:

Cited Author's E-mail [authoremail]:

Publisher [source]:

Date [date]:

Subject Keywords [subject]:

Instructions for webauthors (cited authors) who want to link directly to this form

Figure 1: WebCite Archival Form

The -I option from the man pages for curl:

```
-I, --head
(HTTP/FTP/FILE)  Fetch the HTTP-header only!
HTTP-servers feature the command HEAD which this uses to get nothing
but the header of a document. When used on an FTP or FILE file,
curl displays the file size and last modification time only.
```

As expected only the headers were returned to in the response. To receive back the html the -I option is removed and curl is executed with these arguments:

```
curl -d "url=http://docs.python-requests.org/en/latest/&email=
jberlin@cs.odu.edu" http://webcitation.org/archive
```

The rendered html returned by this curl command is shown in Figure 2

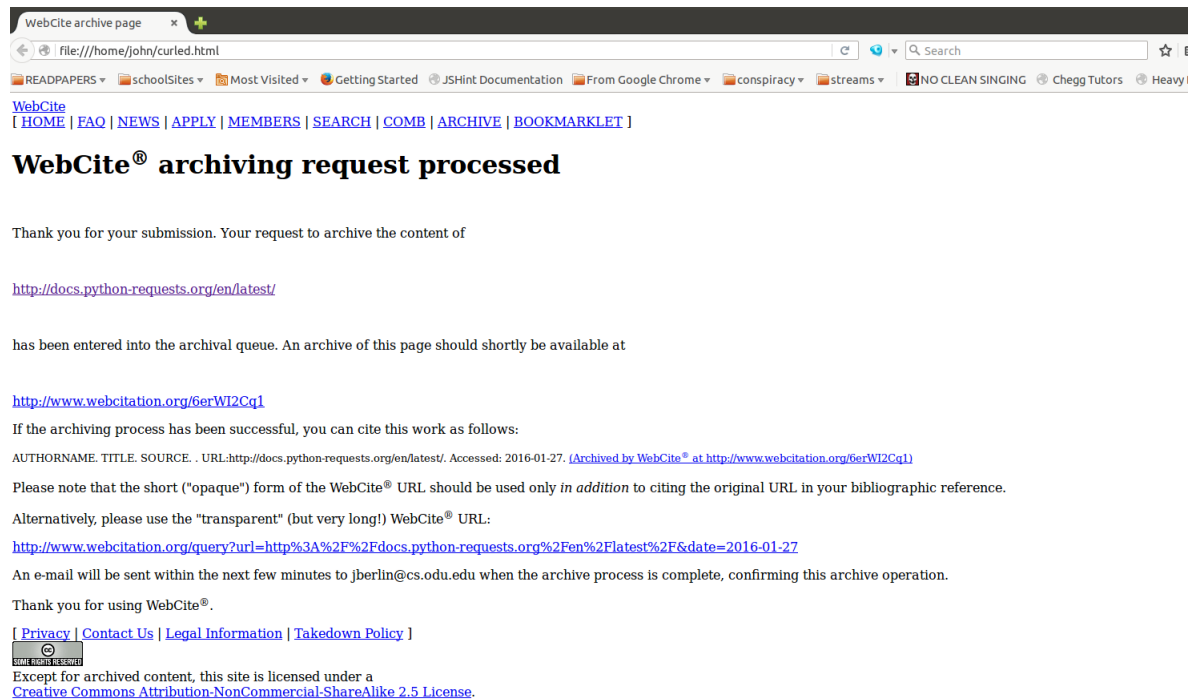


Figure 2: The output of the curl command, rendered in Mozilla Firefox

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-s16/test/pdfs.html>

Answer

```

1 #!/usr/bin/env python3
2 import argparse
3 import re
4 from collections import deque
5
6 import requests
7 from urllib.parse import urljoin
8
9 from bs4 import BeautifulSoup
10
11 reg_s = "((( [A-Za-z]{3,9}:(?\\|\\/)? )?(?:[\\-;:&=\\+\\$,\\w]+@)?[A-Za-z0-9\\.\\-]+|" + \
12         "(?:www\\.|[\\-;:&=\\+\\$,\\w]+@[A-Za-z0-9\\.\\-]+)" + \
13         "((?:\\/[\\+~%\\\\\\.\\w\\-]*)?" + \
14         "\\/?(?:[\\-\\+&%@\\.\\w]*)#(?:[\\.|\\/\\\\\\w]*)?)?)\""
15
16 # my standard url regex found a while ago
17 url_re = re.compile(reg_s, re.IGNORECASE)
18
19 relative = re.compile("(^?!www\\.|(? : http | ftp ) s ? : / / [A-Za-z]: \\| / / )"
20     .*")
21
22 def print_headers(r):
23     print("printing headers for url=", r.url)
24     for headerk, headerv in r.headers.items():
25         print(headerk + ":" + headerv)
26     print("+++++")
27
28 def ispdf(rq):
29     if rq.headers['Content-type'].lower() in 'application/pdf':
30         return True
31     else:
32         return False
33
34 def strip_href(request, que, saw):
35     try:
36         s = BeautifulSoup(request.text, 'html5lib')
37     except:

```

```

38         # just because if this fails there are problems
39         s = BeautifulSoup(request.text)
40     all_a = s.find_all('a', href=True)
41
42     for link in map(lambda a: a['href'], all_a):
43         if link not in saw:
44             if url_re.match(link):
45                 que.append(link)
46             else:
47                 if relative.match(link):
48                     link = urljoin(request.url, link)
49                     que.append(link)
50                 else:
51                     print("The input uri %s failed to pass my regex "
52                           % link, reg-s)
53
54     return s
55
56 if __name__ == '__main__':
57     parser = argparse.ArgumentParser()
58     parser.add_argument("uri", type=str, help="the url to extract
59                        from")
60     parser.add_argument("-v", help="verbose", action="store_true")
61     parser.add_argument("-ph", help="print all headers", action="
62                        store_true")
63
64     args = parser.parse_args()
65
66     # your on Ubuntu and you will like it
67     useragent = 'Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:44.0)
68                Gecko/20100101 Firefox/44.01'
69     session = requests.Session()
70     session.headers.update({'User-Agent': useragent})
71     seen = set()
72     q = deque()
73     q.append(args.uri) # ("http://tinyurl.com/gv8jnso")
74     uri = q.popleft()
75
76     if re.match(url_re, uri):
77         if args.v:
78             print("it matches")
79         else:
80             print("The input uri %s failed to pass my regex " % uri,
81                   reg-s)
82
83     request = session.get(uri)
84     """ :type : requests.Response """
85     if ispdf(request):
86         print("The link %s was a link to an actual pdf file " % uri
87               ,
88               ("but it was misleading %s its length is " % request.
89                url)
89               if uri != request.url else "its length is",
90               request.headers['Content-Length']
91               )
92         print("No other links are in a pdf have nice day")
93     if request.is_redirect or request.is_permanent_redirect:

```

```

88         print("It was dirty reditect ;)")
89     exit()
90     soup = strip_href(request, q, seen)
91     if args.ph:
92         print_headers(request)
93
94     while True:
95         try:
96             uri = q.popleft()
97         except IndexError:
98             break
99         if re.match(url_re, uri):
100             if args.v:
101                 print("the uri %s was valid" % uri)
102         else:
103             print("Bad url %s" % uri)
104             continue
105         seen.add(uri)
106
107         request = session.get(uri)
108         """type : requests.Response """
109
110         if args.ph:
111             print_headers(request)
112
113         if ispdf(request):
114             if request.ok:
115                 print("The link %s was a link to an actual pdf file
116                     " % uri,
117                       ("\n\tbut it was misleading %s its length is
118                       " % request.url)
119                       if uri != request.url else "its length is",
120                       request.headers['Content-Length']
121                       )
122                 continue
123
124             if args.v:
125                 print("so far I have processed these uris: ", seen)
126                 print("I still have these to go", q)
127
128             if request.ok:
129                 print("\nHey were are ok! %i" % request.status_code, "
130                     Done going down the rabbit hole for %s\n" % uri)
131             elif request.is_permanent_redirect or request.is_redirect:
132                 soup = strip_href(request, q, seen)
133
134     session.close()

```

Listing 1: Python program for extracting links from a web page to look for pdf files

The code is shown in Listing 1 starting on page 4:

- Takes an argument uri specifying the web page to extract links from (line 49)
- Takes an optional argument to print extra data (line 50)

- Takes an optional argument to print the headers of all received requests (line 51)
- Open a session for (line 57), Set our user agent (line 58), Download starting URI (line 70), check to see if won on first uri(line 72), otherwise get all hrefs(line 81), and consume each one in web page informing user if pdf was found(lines 87-120)

The core libraries used are

- **argparse**: I do not like sys.args and closest thing to Commons CLI
- **re**: for regular expression support. Do not want some arbitrary href=file.js or malformed uri
- **requests**: better urllib, it will handle sneaky redirects automatically
- **bs4**: get the web soup even tho I like my soup hot and sour

strip.href (lines 31 to 44) takes the html text and retrieves all *a* tags and extracts the uri content and adds it the queue. Return the hot soup after extraction.

Since requests library handles the redirects for us a check to see if there was some trickery the statement `uri != request.url` checks if the uri found in the extraction is not the same as was the final link. If its not a redirect happened for sure.

Executing: `python3 followLinks.py http://www.cs.odu.edu/~mln/teaching/cs532-s16/test/pdfs.html` gives the output

The link `http://www.cs.odu.edu/~mln/pubs/ht-2015/hypertext-2015-temporal-violations.pdf` was a link to an actual pdf file its length is 2184076

The link `http://www.cs.odu.edu/~mln/pubs/tpdl-2015/tpdl-2015-annotations.pdf` was a link to an actual pdf file its length is 622981

The link `http://arxiv.org/pdf/1512.06195` was a link to an actual pdf file but it was misleading
`http://arxiv.org/pdf/1512.06195.pdf` its length is 1748961

The link `http://www.cs.odu.edu/~mln/pubs/tpdl-2015/tpdl-2015-off-topic.pdf` was a link to an actual pdf file its length is 4308768

The link `http://www.cs.odu.edu/~mln/pubs/tpdl-2015/tpdl-2015-stories.pdf` was a link to an actual pdf file its length is 1274604

The link `http://www.cs.odu.edu/~mln/pubs/tpdl-2015/tpdl-2015-profiling.pdf`

was a link to an actual pdf file its length is 639001

The link <http://bit.ly/1ZDatNK> was a link to an actual pdf file
but it was misleading
<http://www.cs.odu.edu/~mln/pubs/jcdl-2015/jcdl-2015-temporal-intention.pdf>
its length is 720476

The link <http://www.cs.odu.edu/~mln/pubs/jcdl-2015/jcdl-2015-mink.pdf>
was a link to an actual pdf file its length is 1254605

The link <http://www.cs.odu.edu/~mln/pubs/jcdl-2015/jcdl-2015-arabic-sites.pdf>
was a link to an actual pdf file its length is 709420

The link <http://www.cs.odu.edu/~mln/pubs/jcdl-2015/jcdl-2015-dictionary.pdf>
was a link to an actual pdf file its length is 2350603

Now when executing it with a link straight to a pdf such as <http://arxiv.org/pdf/1512.06195.pdf>

The link <http://arxiv.org/pdf/1512.06195.pdf>
was a link to an actual pdf file its length is 1748961
No other links are in a pdf have nice day

For the third and final link I saw one in the full output of the program when running on the required link that looked oddly funky lets try it: <http://bit.ly/jcdl-pdf>

Hey were are ok! 200 Done going down the rabbit hole
for <http://twitter.com/webscidl>

The link
<http://www.cs.odu.edu/~mln/pubs/ht-2015/hypertext-2015-temporal-violations.pdf>
was a link to an actual pdf file its length is 2184076

The link <http://www.cs.odu.edu/~mln/pubs/tpdl-2015/tpdl-2015-annotations.pdf> was a link to a

The link <http://arxiv.org/pdf/1512.06195> was a link to an actual pdf file
but it was misleading
<http://arxiv.org/pdf/1512.06195.pdf> its length is 1748961

The link <http://www.cs.odu.edu/~mln/pubs/tpdl-2015/tpdl-2015-off-topic.pdf> was a link to an

The link <http://www.cs.odu.edu/~mln/pubs/tpdl-2015/tpdl-2015-stories.pdf>
was a link to an actual pdf file its length is 1274604

The link <http://www.cs.odu.edu/~mln/pubs/tpdl-2015/tpdl-2015-profiling.pdf> was a link to an actual pdf file its length is 639001

The link <http://bit.ly/1ZDatNK> was a link to an actual pdf file but it was misleading
<http://www.cs.odu.edu/~mln/pubs/jcdl-2015/jcdl-2015-temporal-intention.pdf>
its length is 720476

The link <http://www.cs.odu.edu/~mln/pubs/jcdl-2015/jcdl-2015-mink.pdf> was a link to an actual pdf file its length is 1254605

The link <http://www.cs.odu.edu/~mln/pubs/jcdl-2015/jcdl-2015-arabic-sites.pdf> was a link to an actual pdf file its length is 709420

The link <http://www.cs.odu.edu/~mln/pubs/jcdl-2015/jcdl-2015-dictionary.pdf> was a link to an actual pdf file its length is 2350603

Oddly familiar would you not agree with me.

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 --> B
B --> C
C --> D
C --> A
C --> G
E --> F
G --> C
G --> H
I --> H
I --> J
I --> K
J --> D
L --> D
M --> A
M --> N
N --> D
O --> A
P --> G
```

For the above graph, give the values for:

IN:
SCC:
OUT:
Tendrils:
Tubes:
Disconnected:

- **IN:** [M,O,P] nodes(pages) that can reach the SCC, but cannot be reached from it
- **SCC:** [A,B,C,G] central core, all of whose pages can reach one another along directed links
- **OUT:** [D,H]: pages that are accessible from the SCC, but do not link back to it
- **Tendrils:** [I,J,K,L] pages that cannot reach the SCC, and cannot be reached from the SCC

- **Tubes:** $[N]$ passage from a portion of IN to a portion of OUT without touching SCC
- **Disconnected:** $[E,F]$ pages who do not fit the descriptions above or has no links to the core or other pages

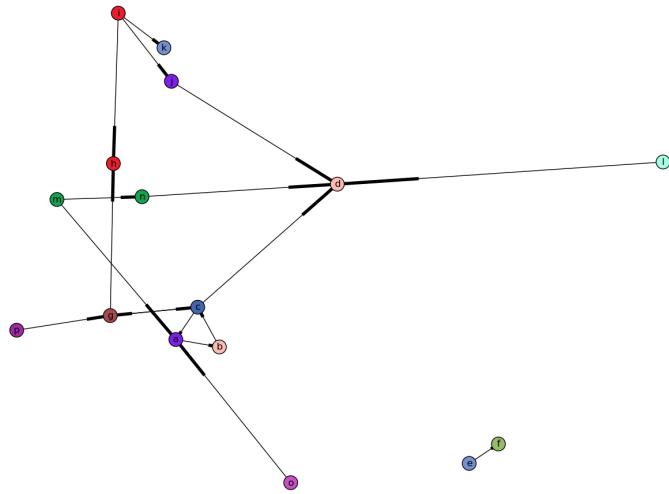


Figure 3: A different means of looking at the graph

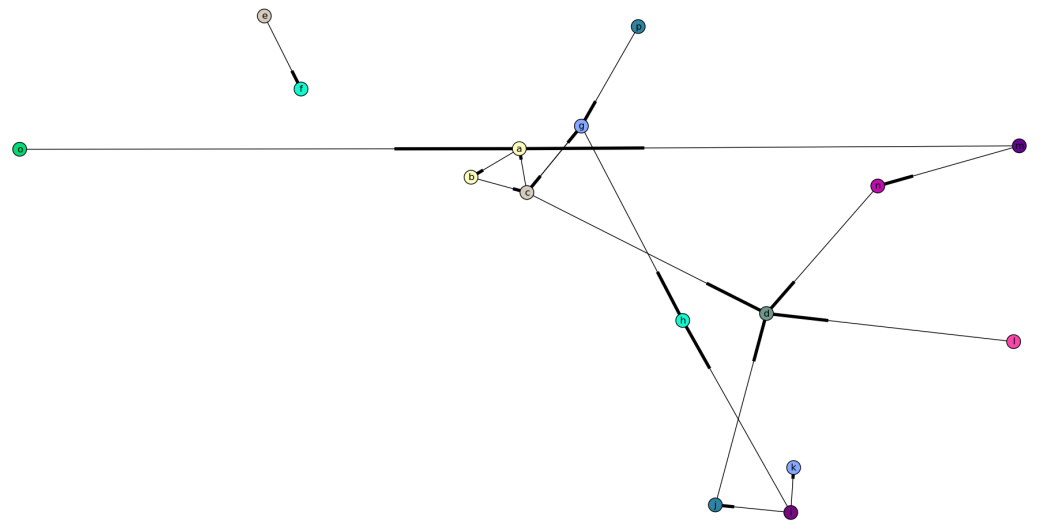


Figure 4: A different means of looking at the graph2