Assignment-1 **Chandrasekhar Reddy Muthyala**
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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:

Data can be posted into the form by using CURL at the command line like below curl –data "param1=value1&param2=value2" -X POST ¡URL¿ –data ¡data¿ Send specified data in POST request -X, –request The request method to use[1].

Example:

Let's print HTML page using "curl". This page " problem1.html" is created for test purpose. It makes it possible to post data using a web browser:

```
curl --data  "fname=chandu\&lname=muthyala" http://qav2.cs.odu.edu/
    chandu/WebSciences/A1/problem1.php -o problem1.html
```

Listing 1: Command:

```
<!DOCTYPE html>
<html>
<body>
<?php
      echo "<br>";
      echo "<br>";
      echo "<b>fname␣Posted:␣</b>" . $_POST['fname'] . "<br>";
      echo "<b>lname␣Posted:␣</b>" . $_POST['lname'] . "<br>";
?>

</body>
</html>
```

Listing 2: Output: The content of problem1.html

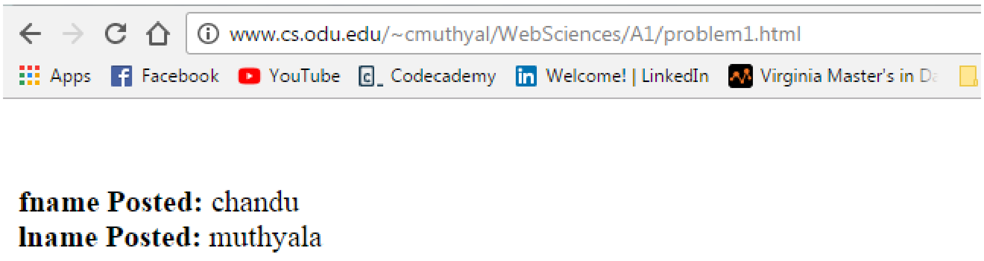
I created a problem1.php file which contain a HTML code and expects two parameters fname and lname and these two parameters are included inside html code to show they are posted correctly.

```
<!DOCTYPE html>
<html>
<body>
<br /><br /><b>fname Posted: </b>chandu<br /><b>lname Posted: </b>
    muthyala<br />
</body>
</html>
```

Listing 3: Output: The output of problem1.php

We can clearly see that the response is saved to a file named “problem1.html”.

Figure 1: Screenshot of The file problem1.html opened in a web browser



fname Posted: chandu
lname Posted: muthyala

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:

```
#!/usr/bin/env python3
import sys
import requests
from bs4 import BeautifulSoup
import urllib.request
from urllib.error import URLError
from urllib.parse import urlparse
class Assignment1:
    def __init__(self):
        self.title = "*** Extracting all the Links from a web-page. ***"
        self.vistitedLinks= []
        self.pdfList = {}
        self.movedLinks = []
        self.linkList = []

    def printSysArguments(self):
        length = len(sys.argv)
        if length>1:
            self.siteUrl = sys.argv[1]
            print(”Entered␣URL:␣”, self.siteUrl)
    def returnPdfs(self, url):
        try:
            responsed = requests.get(url)
            if(responsed.history):
                res = urllib.request.urlopen(responsed.url)
                print(”Final␣URL:”,responsed.url)
            else:
                res = urllib.request.urlopen(url)
                print(”Final␣URL:”,url)

            intialStatus = responsed.status_code
            if(intialStatus==200):
                info = res.info()
                redditHtml = res.read()
                soup = BeautifulSoup(redditHtml, ”html.parser”)
                for link in soup.find_all(’a’):
                    if not link.get(’href’)==None:
                        if not link.get(’href’).startswith(”#”) and not link.get(’href’)==”” and not link.get(’href’).startswith(”?”):
                            if not bool(urlparse(link.get(’href’)).netloc):
                                finalUrl = url+link.get(’href’)
                                linkreq = urllib.request.Request(url+link.get(’href’))
                            else:
                                finalUrl = link.get(’href’)
                                linkreq = urllib.request.Request(link.get(’href’))
                            try:
                                linkRes = urllib.request.urlopen(linkreq)
                                linkStatus = linkRes.getcode()
                                linkContentType = linkRes.info().get_content_type()
                                if linkStatus==200:
                                    if linkContentType == ”application/pdf”:
                                        self.linkList.append(finalUrl)
                                        self.pdfList[link.get(’href’)]=linkRes.headers[’content-length’]
                                    elif linkContentType == ”text/html”:
                                        self.linkList.append(finalUrl)
                                        if  link.get(’href’) not in self.vistitedLinks:
                                            self.vistitedLinks.append(link.get(’href’))
                                elif linkStatus>=300 and linkStatus<400:
                                    if link.get(’href’) not in self.vistitedLinks and linkRes.geturl() not in movedLinks:
                                        self.vistitedLinks.append(link.get(’href’))
                                        self.vistitedLinks.append(linkRes.geturl())
                                        self.movedLinks.append(linkRes.geturl())
                    self.returnPdfs(linkRes.geturl())
              except URLError as e:
                  if hasattr(e, 'reason'):
                    # print('Reason: ', e.reason)
                    pass
                  elif hasattr(e, 'code'):
                    # print('Error code: ', e.code)
                    pass
    except URLError as e:
        if hasattr(e, 'reason'):
          # print('Reason: ', e.reason)
          pass
        elif hasattr(e, 'code'):
          # print('Error code: ', e.code)
          pass

    return self.pdfList

obj = Assignment1()
if(len(sys.argv)==2):
  obj.printSysArguments()
  listOfLinks = obj.returnPdfs(obj.siteUrl)
  if(len(listOfLinks)>0):
    print("Pdfs in the link:")
    for link in listOfLinks:
      print("\t",link,":",listOfLinks[link]," Bytes")
    for link in obj.movedLinks:
      print("moved:", link)
  else:
    print("Pdfs in the link: None")

  print("All the links in the given link:")
  for link in obj.linkList:
    print("\t",link)

else:
  print("Please provide URL along with file name.")
```

Listing 4: The content of Assignment1.py

Running the program:

The main aim of the below program is to extract all the Pdfs from the given URI. This program was done using python classes. When the program runs Assignment1.py, it first check whether URI is provided in the command line, if not provided will throw an error saying Please provide URI along with file name. If the checking condition is true, the URI is passing to the member function returnPdfs of Assignment1 class. In the returnPdfs function initially checking passed URI has redirections by using requests library and getting the final URI of the passed URI . Making a first request using urllib library in the try block, I have include an error reporting

library to avoid exceptions which causes from http connection and urls.. By using urllib.request library I am extracting the all the HTML content of the URI and passing to beautiful soap to get all the links. Checking whether link is absolute or not by using urlparse library, based on that I am finding the final URL and request is made for link in a try block to avoid http connection errors and URL errors. Getting the info of each link and extracting the header information, checking the status code of the link If the link is with status code 200and then checking the content-type is application/pdf and I am storing the link and its file size in to a dictionary. If content type is text/html I am moving that link into a visited list so that I can avoid duplicate links in displaying all the links in provided URI. In case if status code is in the range of 300-399 the URI is passed to the returnPdfs function and process repeated as stated above.
First Test Case: Let's test the link:
http://www.gmail.com
The link above is redirected to the link:
https://accounts.google.com/ServiceLogin?service=mail&passive=true&rm=false&continue=https://mail.goo
Pdfs in the links: None

```
python Assignment1.py ”http://www.gmail.com”
```

Listing 5: Command:

```
Entered URL:
 http://www.gmail.com
Final URL:
https://accounts.google.com/ServiceLogin?service=mail\&passive=true\&rm=false\&continue=https://mail.google.com/mail/\&ss=1\&scc=1\&ltmpl=default\&ltmplcache=2\&emr=1\&osid=1
Pdfs in the link: None
All the links in the given link:
    https://accounts.google.com/signin/usernamerecovery?continue=https\%3A\%2F\%2Fmail.google.com\%2Fmail\%2F\&service=mail\&ss=1\&scc=1\&rm=false\&osid=1\&hl=en
    https://accounts.google.com/AccountChooser?continue=https\%3A\%2F\%2Fmail.google.com\%2Fmail\%2F\&service=mail\&rm=false\&ltmpl=default\&scc=1\&ss=1\&osid=1\&emr=1
    https://accounts.google.com/SignUp?service=mail\&continue=https\%3A\%2F\%2Fmail.google.com\%2Fmail\%2F\&ltmpl=default
    https://www.google.com/intl/en/about
    https://accounts.google.com/TOS?loc=US\&hl=en\&privacy=true
    https://accounts.google.com/TOS?loc=US\&hl=en
    http://www.google.com/support/accounts?hl=en
```

Listing 6: Output:

Required Test Case: http://www.cs.odu.edu/˜mln/teaching/cs532-s17/test/pdfs.html

```
python Assignment1.py ”␣http://www.cs.odu.edu/˜mln/teaching/cs532-s17/test/pdfs.html”
```

Listing 7: Command:

```
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
Pdfs in the link:
    http://www.cs.odu.edu/~mln/pubs/ht-2015/hypertext-2015-temporal-violations.pdf : 2184076  Bytes
    http://www.cs.odu.edu/~mln/pubs/tpdl-2015/tpdl-2015-annotations.pdf : 622981  Bytes
    http://arxiv.org/pdf/1512.06195 : 1748961  Bytes
    http://www.cs.odu.edu/~mln/pubs/tpdl-2015/tpdl-2015-off-topic.pdf : 4308768  Bytes
    http://www.cs.odu.edu/~mln/pubs/tpdl-2015/tpdl-2015-stories.pdf : 1274604  Bytes
    http://www.cs.odu.edu/~mln/pubs/tpdl-2015/tpdl-2015-profiling.pdf : 639001  Bytes
    http://www.cs.odu.edu/~mln/pubs/jcdl-2014/jcdl-2014-brunelle-damage.pdf : 2205546  Bytes
    http://bit.ly/1ZDatNK : 720476  Bytes
    http://www.cs.odu.edu/~mln/pubs/jcdl-2015/jcdl-2015-mink.pdf : 1254605  Bytes
    http://www.cs.odu.edu/~mln/pubs/jcdl-2015/jcdl-2015-arabic-sites.pdf : 709420  Bytes
    http://www.cs.odu.edu/~mln/pubs/jcdl-2015/jcdl-2015-dictionary.pdf : 2350603  Bytes
All the links in the given link:
    http://twitter.com/webscidl
    http://www.dlib.org/dlib/november15/vandesompel/11vandesompel.html
    http://arxiv.org/abs/1508.02315
    http://arxiv.org/abs/1508.02315
    http://www.cs.odu.edu/~mln/pubs/ht-2015/hypertext-2015-temporal-violations.pdf
    http://www.cs.odu.edu/~mln/pubs/tpdl-2015/tpdl-2015-annotations.pdf
    http://arxiv.org/pdf/1512.06195
    http://www.cs.odu.edu/~mln/pubs/tpdl-2015/tpdl-2015-off-topic.pdf
    http://www.cs.odu.edu/~mln/pubs/tpdl-2015/tpdl-2015-stories.pdf
    http://www.cs.odu.edu/~mln/pubs/tpdl-2015/tpdl-2015-profiling.pdf
    http://dx.doi.org/10.1007/s00799-015-0150-6
    http://www.cs.odu.edu/~mln/pubs/jcdl-2014/jcdl-2014-brunelle-damage.pdf
    http://arxiv.org/abs/1506.06279
    http://dx.doi.org/10.1007/s00799-015-0155-1
    http://bit.ly/1ZDatNK
    http://www.cs.odu.edu/~mln/pubs/jcdl-2015/jcdl-2015-mink.pdf
    http://www.cs.odu.edu/~mln/pubs/jcdl-2015/jcdl-2015-arabic-sites.pdf
    http://www.cs.odu.edu/~mln/pubs/jcdl-2015/jcdl-2015-dictionary.pdf
    http://bit.ly/jcdl-pdf
    http://dx.doi.org/10.1007/s00799-015-0140-8

------------------------------------------------
```

Listing 8: Output:

Additional Test Case: http://www.cs.odu.edu/ mweigle/

```
python Assignment1.py ”␣http://www.cs.odu.edu/~mweigle/”
```

Listing 9: Command:

```
Entered URL:  http://www.cs.odu.edu/~mweigle/
Final URL: http://www.cs.odu.edu/~mweigle/
Pdfs in the link:
    http://www.cs.odu.edu/~mweigle/files/CV.pdf : 101583  Bytes
    http://www.cs.odu.edu/~mweigle/papers/alkwai-tois17-preprint.pdf : 1430568  Bytes
    http://www.cs.odu.edu/~mweigle/papers/alam-jcdl17.pdf : 1600140  Bytes
    http://www.cs.odu.edu/~anwala/files/publications/NwalaJCDL_LMP.pdf : 17623699  Bytes
    http://www.cs.odu.edu/~mweigle/papers/alnoamany-websci17.pdf : 6962016  Bytes
    http://www.cs.odu.edu/~mweigle/papers/brunelle-jcdl17.pdf : 1276346  Bytes
    http://www.cs.odu.edu/~mkelly/papers/2017_jcdl_wail.pdf : 412476  Bytes
    http://www.cs.odu.edu/~mkelly/papers/2017_jcdl_countingMementos.pdf : 274265  Bytes
    http://www.cs.odu.edu/~mln/pubs/jcdl-2015/jcdl-2015-mink.pdf : 1254605  Bytes
    http://www.cs.odu.edu/~mln/pubs/jcdl-2015/jcdl-2015-arabic-sites.pdf : 709420  Bytes
    http://www.cs.odu.edu/~mweigle/papers/mohrehkesh-misenet14.pdf : 1231147  Bytes
    http://www.cs.odu.edu/~mln/pubs/jcdl-2014/jcdl-2014-brunelle-damage.pdf : 2205546  Bytes
    http://www.cs.odu.edu/~mweigle/papers/olariu-misenet13.pdf : 405542  Bytes
    http://www.cs.odu.edu/~mln/pubs/tpdl-2013/paper_149.pdf : 813692  Bytes
    http://www.cs.odu.edu/~mweigle/papers/yan-soli09.pdf : 278184  Bytes
All the links in the given link:
    http://www.cs.odu.edu
    http://www.odu.edu
```

```
http://www.cs.odu.edu/~mweigle/Main/Home?action=login
http://www.cs.odu.edu/~mweigle/Main/Home
http://www.cs.odu.edu/~mweigle/Main/Research
http://www.cs.odu.edu/~mweigle/Main/PubsByYear
http://www.cs.odu.edu/~mweigle/Main/Students
http://www.cs.odu.edu/~mweigle/files/CV.pdf
http://www.cs.odu.edu/~mweigle/Resources/WorkingWithMe
http://www.cs.odu.edu/~mweigle/Resources/ResearchMethods
http://www.cs.odu.edu/~mweigle/Resources/InfoVis
http://www.cs.odu.edu/~mweigle/Main/Teaching
http://www.cs.odu.edu/~mweigle/Main/Sched
http://www.cs.odu.edu/~mweigle/Main/Personal
http://www.cs.odu.edu/~mweigle/CS725-S18/Home
https://graduate.cs.odu.edu/
http://www.cs.odu.edu/~yaohang
https://securegrants.neh.gov/publicquery/main.aspx?f=1&gn=HAA-256368-17
https://www.neh.gov/divisions/odh/grant-news/announcing-new-2017-odh-grant-awards
http://ws-dl.blogspot.com
http://ws-dl.blogspot.com/2018/01/2018-01-08-introducing-reconstructive.html
http://ws-dl.blogspot.com/2018/01/2018-01-07-review-of-ws-dls-2017.html
http://ws-dl.blogspot.com/2018/01/2018-01-06-two-wsdl-classes-offered-for.html
http://ws-dl.blogspot.com/2018/01/2018-01-02-link-to-web-archives-not.html
http://ws-dl.blogspot.com/2017/12/2017-12-31-digital-blackness-in-archive.html
http://www.cs.odu.edu/~mweigle/Research/InfoVis-Gallery
https://arxiv.org/abs/1712.03140
http://www.cs.odu.edu/~mweigle/Main/Home?action=bibentry&bibfile=Main.bibtex&bibref=aturban-arxiv17
https://arxiv.org/abs/1708.05790
http://www.cs.odu.edu/~mweigle/Main/Home?action=bibentry&bibfile=Main.bibtex&bibref=mccoy-arxiv17
http://www.cs.odu.edu/~mweigle/papers/alkwai-tois17-preprint.pdf
http://www.cs.odu.edu/~mweigle/Main/Home?action=bibentry&bibfile=Main.bibtex&bibref=alkwai-tois17
http://www.cs.odu.edu/~mweigle/papers/alam-jcdl17.pdf
http://www.cs.odu.edu/~mweigle/Main/Home?action=bibentry&bibfile=Main.bibtex&bibref=alam-jcdl17
http://www.cs.odu.edu/~anwala/files/publications/NwalaJCDL_LMP.pdf
http://www.cs.odu.edu/~mweigle/Main/Home?action=bibentry&bibfile=Main.bibtex&bibref=nwala-jcdl17
http://www.cs.odu.edu/~mweigle/papers/alnoamany-websci17.pdf
http://www.cs.odu.edu/~mweigle/Main/Home?action=bibentry&bibfile=
    Main.bibtex&bibref=alnoamany-websci17
http://www.cs.odu.edu/~mweigle/papers/brunelle-jcdl17.pdf
http://www.cs.odu.edu/~mweigle/Main/Home?action=bibentry&bibfile=
    Main.bibtex&bibref=brunelle-jcdl17
http://dx.doi.org/10.1109/JCDL.2017.7991619
http://www.cs.odu.edu/~mkelly/papers/2017_jcdl_wail.pdf
http://www.cs.odu.edu/~mweigle/Main/Home?action=bibentry&bibfile=
    Main.bibtex&bibref=berlin-jcdl17
http://dx.doi.org/10.1109/JCDL.2017.7991601
http://www.cs.odu.edu/~mkelly/papers/2017_jcdl_countingMementos.
    pdf
http://www.cs.odu.edu/~mweigle/Main/Home?action=bibentry&bibfile=
    Main.bibtex&bibref=kelly-jcdl17
http://arxiv.org/abs/1705.06218
http://www.cs.odu.edu/~mweigle/Main/Home?action=bibentry&bibfile=
    Main.bibtex&bibref=alnoamany-arxiv17
http://dx.doi.org/10.1109/JCDL.2017.7991601
http://www.cs.odu.edu/~mkelly/papers/2017_jcdl_countingMementos.
    pdf
http://www.cs.odu.edu/~mweigle/Main/Home?action=bibentry&bibfile=
    Main.bibtex&bibref=kelly-jcdl17
http://www.cs.odu.edu/~mln/pubs/jcdl-2015/jcdl-2015-mink.pdf
http://www.cs.odu.edu/~mweigle/Main/Home?action=bibentry&bibfile=
    Main.bibtex&bibref=jordan-jcdl15
http://www.cs.odu.edu/~mln/pubs/jcdl-2015/jcdl-2015-arabic-sites.
    pdf
http://www.cs.odu.edu/~mweigle/Main/Home?action=bibentry&bibfile=
    Main.bibtex&bibref=alkwai-jcdl15
http://dx.doi.org/10.1109/MASS.2014.91
http://www.cs.odu.edu/~mweigle/papers/mohrehkesh-misenet14.pdf
http://www.cs.odu.edu/~mweigle/Main/Home?action=bibentry&bibfile=
    Main.bibtex&bibref=mohrehkesh-misenet14
http://dx.doi.org/10.1109/JCDL.2014.6970187
http://www.cs.odu.edu/~mln/pubs/jcdl-2014/jcdl-2014-brunelle-
    damage.pdf
http://www.cs.odu.edu/~mweigle/Main/Home?action=bibentry&bibfile=
    Main.bibtex&bibref=brunelle-jcdl14
http://www.cs.odu.edu/~mweigle/papers/olariu-misenet13.pdf
http://www.cs.odu.edu/~mweigle/Main/Home?action=bibentry&bibfile=
    Main.bibtex&bibref=olariu-misenet13
http://dx.doi.org/10.1007/978-3-642-40501-3_35
http://www.cs.odu.edu/~mln/pubs/tpdl-2013/paper_149.pdf
http://arxiv.org/abs/1309.4016
http://www.cs.odu.edu/~mweigle/Main/Home?action=bibentry&bibfile=
    Main.bibtex&bibref=alnoamany-tpdl13
http://dx.doi.org/10.1109/SOLI.2009.5203967
http://www.cs.odu.edu/~mweigle/papers/yan-soli09.pdf
http://www.cs.odu.edu/~mweigle/Main/Home?action=bibentry&bibfile=
    Main.bibtex&bibref=yan-soli09
```

```
https://securegrants.neh.gov/publicquery/main.aspx?f=1&gn=HAA-256368-17
https://mellon.org/grants/grants-database/grants/old-dominion-university/11600663/
http://www.nsf.gov/awardsearch/showAward?AWD_ID=1526700
http://www.imls.gov/grants/awarded/lg-71-15-0077-15
http://www.cs.odu.edu/~mweigle/files/CV.pdf
http://www.cs.odu.edu/~acmw
http://www.ncwit.org/alliances/aa
http://www.cs.odu.edu/
http://www.odu.edu/
http://www.clemson.edu/ces/departments/computing/
http://www.clemson.edu
http://www.cs.unc.edu
http://www.unc.edu
http://www.ulm.edu/cba/computerscience/index.html
http://www.ulm.edu/honors
http://www.ulm.edu
http://www.cs.odu.edu/~mweigle/Main/Home?action=print
http://www.cs.odu.edu/~mweigle/Site/Search
http://www.cs.odu.edu/~mweigle/Main/Home?action=login

------------------------------------------------------------
```

Listing 10: Output:

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 ⟶ K
L ⟶ D
M ⟶ A
M ⟶ N
N ⟶ D
O ⟶ A
P ⟶ G

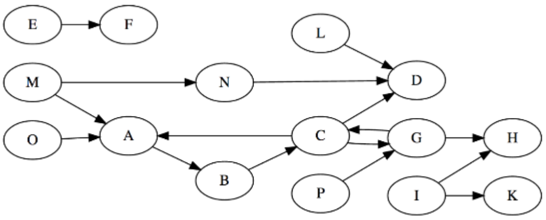
For the above graph, give the values for: IN, SCC, OUT, Tendrils, Tubes, Disconnected.

Answer:

IN: O, M, P
These values are considered the *IN* values due to the fact that they can reach values that are considered to be in the *SCC* and also because they can't be reached from the *SCC*
SCC: A, B, C G
These values are considered the *SCC* values because they are at the "heart of the graph." They either are all nodes that can reach another node along directed links. This can consist of links from the outside in, nodes inside the *SCC* pointing to other nodes inside, or nodes point from the inside out .
OUT: H, D
These values are part of the *OUT* because they are accessible from the *SCC* but they cannot link back into it .
Tendrils: I, K, L
These values don't reference the *SCC* at any point, but do have links to the *OUT* nodes and therefore they are considered the *tendrils*

Tubes: N. (There is one tube that runs from M to N to D).
This value isn't part of the "heart of the graph" but it does connect an *IN* node to an *OUT* node in one step, not touching the *SCC* in the process
Disconnected: E, F
These two values are as their title describes - disconnected. They aren't part of the *SCC* and don't connect to anything else on the graph.

Figure 2: Bowtie graph



Included Files:

bowtie.png

References

[1] ttps://gist.github.com/subfuzion/08c5d85437d5d4f00e58.