Testing Framework For Read the Docs

CSCI 362

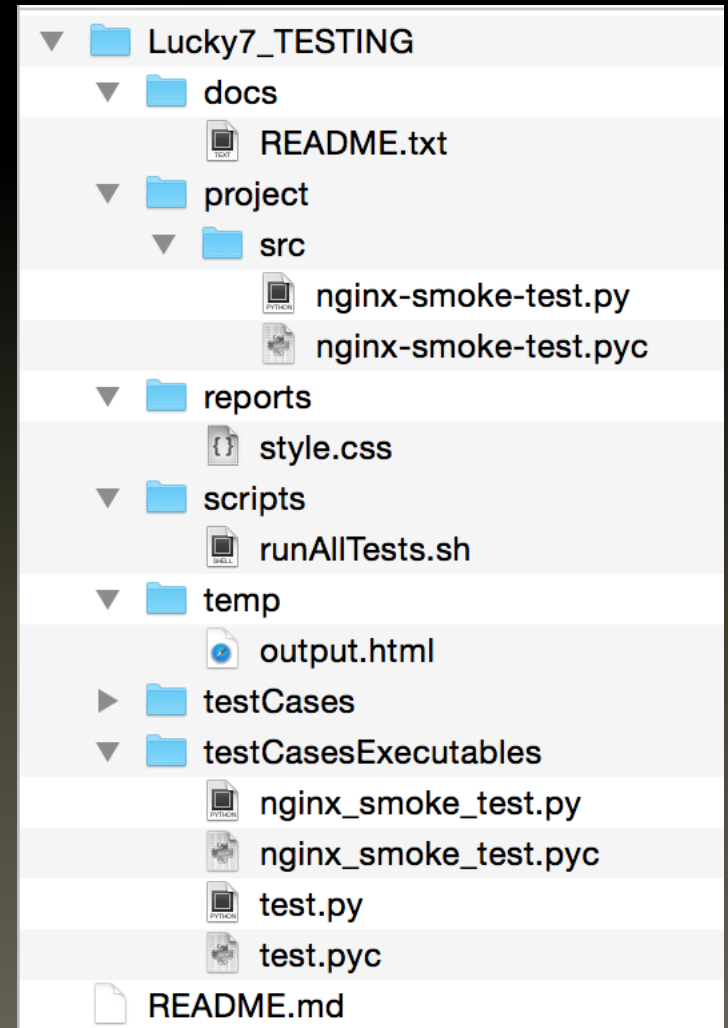Laura Barber, Venessa Johansen-Barrera, and Michael Blackburn

Read the Docs

Create, host, and browse documentation.

- Documentation hosting

- Fully searchable

- Import using major version control systems

- Supports webhooks so docs are built when you commit code

- Versioning support

Framework Structure

• runAllTests.sh

  handles all testing

Tested Methods

- Methods test whether a url is served by nginx, django, perl

    - Each accepts a url, checks status code

- If status code returned is 200, url is served by specified server

```python
def served_by_nginx(url):
    """Return True if url returns 200 and is served by Nginx."""
    r = requests.get(url, allow_redirects=False)
    status = (r.status_code == 200)
    nginx = ('x-served' in r.headers and r.headers['x-served'] == 'Nginx')
    return all([status, nginx])
```

Test Cases

```
10
url is served by nginx and return 200 OK
served_by_nginx
https://ericholschercom.readthedocs.org/en/latest/
True
```

- Test number

- Requirement being tested

- Method name being tested

- Input for test (url)

- Expected outcome (oracle)

Driver

- test.py contains only one method: runMethod()

- Calls method to be tested

- Detects whether file is executed

```python
import nginx_smoke_test #import proxy
import sys

def runMethod(method,url):
    print(getattr(nginx_smoke_test, method)(url))


if __name__ == '__main__':
    runMethod(*sys.argv[1:])
```

Testing Output

- Tabled results for

  each test case

| Test	Requirement	Method	Input	Oracle	Output	Result
1	⬀	served_by_nginx	https://pip.readthedocs.org/en/latest/	True	True	✔
2	⬀	served_by_nginx	http://docs.fabfile.org/en/latest/	True	True	✔
3	⬀	served_by_nginx	https://pip.readthedocs.org/en/latest/usage.html	True	True	✔
4	⬀	served_by_nginx	https://pip.readthedocs.org/en/1.4.1/	True	True	✔
5	⬀	served_by_nginx	https://pip.readthedocs.org/en/1.4.1/news.html	True	True	✔
6	⬀	served_by_nginx	http://docs.fabfile.org/en/latest/usage/execution.html	True	True	✔
7	⬀	served_by_nginx	http://phpmyadmin.readthedocs.org/ja/latest/	True	True	✔
8	⬀	served_by_nginx	http://phpmyadmin.readthedocs.org/cs/latest/	True	True	✔
9	⬀	served_by_nginx	http://phpmyadmin.readthedocs.org/en/latest/	True	True	✔
10	⬀	served_by_nginx	https://ericholschercom.readthedocs.org/en/latest/	True	True	✔
11	⬀	served_by_nginx	https://ericholschercom.readthedocs.org/about/	True	True	✔
12	⬀	served_by_nginx	https://ericholschercom.readthedocs.org/en/latest/about/	True	True	✔
13	⬀	served_by_nginx	http://docs.pylonsproject.org/projects/pyramid/en/latest/	True	True	✔
14	⬀	served_by_nginx	http://docs.pylonsproject.org/projects/pyramid-amon/en/latest/genindex.html	True	True	✔
15	⬀	served_by_django	https://readthedocs.org/search/	True	True	✔
16	⬀	served_by_django	https://readthedocs.org/api/v1/?format=json	True	True	✔
17	⬀	served_by_django	https://readthedocs.org/accounts/login/	True	True	✔
18	⬀	served_by_django	https://readthedocs.org/accounts/login/	True	True	✔
19	⬀	served_by_perl	http://www.perl.org/	False	False	✔
20	⬀	served_by_perl	https://ericholschercom.readthedocs.org/	False	False	✔
21	⬀	served_by_perl	http://www.microsoft.com	False	False	✔
22	⬀	served_by_nginx	http://www.microsoft.com	False	False	✔
23	⬀	served_by_perl	http://my.cofc.edu	False	False	✔
24	⬀	served_by_nginx	http://my.cofc.edu	False	False	✔
25	⬀	served_by_django	http://my.cofc.edu	True	True	✔

Fault Injection

- Errors typical to programming

- Introduction of logical errors

- Introduction of typographical errors

```python
#fault injection -- logic error: changing "200" to "404"
#fault injection -- typographical error: changing "==" to "="
def served_by_nginx(url):
    """Return True if url returns 200 and is served by Nginx."""
    r = requests.get(url, allow_redirects=False)
    status = (r.status_code == 404)
    nginx = ('x-served' in r.headers and r.headers['x-served'] = 'Nginx')
    return all([status, nginx])
```

Fault Injection (cont.)

Test	Requirement	Method	Input	Oracle	Output	Result
1	⬈	served_by_nginx	https://pip.readthedocs.org/en/latest/	True	False	✖
2	⬈	served_by_nginx	http://docs.fabfile.org/en/latest/	True	False	✖
3	⬈	served_by_nginx	https://pip.readthedocs.org/en/latest/usage.html	True	False	✖
4	⬈	served_by_nginx	https://pip.readthedocs.org/en/1.4.1/	True	False	✖
5	⬈	served_by_nginx	https://pip.readthedocs.org/en/1.4.1/news.html	True	False	✖
6	⬈	served_by_nginx	http://docs.fabfile.org/en/latest/usage/execution.html	True	False	✖
7	⬈	served_by_nginx	http://phpmyadmin.readthedocs.org/ja/latest/	True	False	✖
8	⬈	served_by_nginx	http://phpmyadmin.readthedocs.org/cs/latest/	True	False	✖
9	⬈	served_by_nginx	http://phpmyadmin.readthedocs.org/en/latest/	True	False	✖
10	⬈	served_by_nginx	https://ericholschercom.readthedocs.org/en/latest/	True	False	✖
11	⬈	served_by_nginx	https://ericholschercom.readthedocs.org/about/	True	False	✖
12	⬈	served_by_nginx	https://ericholschercom.readthedocs.org/en/latest/about/	True	False	✖
13	⬈	served_by_nginx	http://docs.pylonsproject.org/projects/pyramid/en/latest/	True	False	✖
14	⬈	served_by_nginx	http://docs.pylonsproject.org/projects/pyramid-amon/en/latest/genindex.html	True	False	✖
22	⬈	served_by_nginx	http://www.microsoft.com	False	False	✔
23	⬈	served_by_perl	http://my.cofc.edu	False	False	✔
24	⬈	served_by_nginx	http://my.cofc.edu	False	False	✔

Fault Injection (cont.)

Test	Requirement	Method	Input	Oracle	Output	Result
1	⬀	served_by_nginx	https://pip.readthedocs.org/en/latest/	True		✖
2	⬀	served_by_nginx	http://docs.fabfile.org/en/latest/	True		✖
3	⬀	served_by_nginx	https://pip.readthedocs.org/en/latest/usage.html	True		✖
4	⬀	served_by_nginx	https://pip.readthedocs.org/en/1.4.1/	True		✖
5	⬀	served_by_nginx	https://pip.readthedocs.org/en/1.4.1/news.html	True		✖
6	⬀	served_by_nginx	http://docs.fabfile.org/en/latest/usage/execution.html	True		✖
7	⬀	served_by_nginx	http://phpmyadmin.readthedocs.org/ja/latest/	True		✖
8	⬀	served_by_nginx	http://phpmyadmin.readthedocs.org/cs/latest/	True		✖
9	⬀	served_by_nginx	http://phpmyadmin.readthedocs.org/en/latest/	True		✖
10	⬀	served_by_nginx	https://ericholschercom.readthedocs.org/en/latest/	True		✖
11	⬀	served_by_nginx	https://ericholschercom.readthedocs.org/about/	True		✖
12	⬀	served_by_nginx	https://ericholschercom.readthedocs.org/en/latest/about/	True		✖
13	⬀	served_by_nginx	http://docs.pylonsproject.org/projects/pyramid/en/latest/	True		✖
14	⬀	served_by_nginx	http://docs.pylonsproject.org/projects/pyramid-amon/en/latest/genindex.html	True		✖
15	⬀	served_by_django	https://readthedocs.org/search/	True		✖
16	⬀	served_by_django	https://readthedocs.org/api/v1/?format=json	True		✖
17	⬀	served_by_django	https://readthedocs.org/accounts/login/	True		✖
18	⬀	served_by_django	https://readthedocs.org/accounts/login/	True		✖
19	⬀	served_by_perl	http://www.perl.org/	False		✖
20	⬀	served_by_perl	https://ericholschercom.readthedocs.org/	False		✖
21	⬀	served_by_perl	http://www.microsoft.com	False		✖
22	⬀	served_by_nginx	http://www.microsoft.com	False		✖
23	⬀	served_by_perl	http://my.cofc.edu	False		✖
24	⬀	served_by_nginx	http://my.cofc.edu	False		✖
25	⬀	served_by_django	http://my.cofc.edu	True		✖

Test Script

```bash
1    #!/bin/bash
2
3    # check if temp directory is empty. If not, remove files.
4    DIR="temp/"
5    if [ "$(ls -A $DIR)" ]; then
6        echo "Removing files from temp folder."
7        rm temp/*
8    else
9        echo "Temp folder is already empty."
10   fi
11
12   # Static html elements and css styling
13   while read LINE; do
14       echo "$LINE" >> temp/output.html
15   done < "reports/style.css"
16
17   # perform these actions 25 times, once for each test.
18   # loops through all files contained in testCases directory.
19   for filename in testCases/*.txt; do
20       i="${filename//[^0-9]/}"
21       echo "Performing test $i."
22       # create an array and populate it with contents of testCase file
23       ARRAY=()
24       while read LINE; do
25           ARRAY+=("$LINE")
26       done < "$filename"
27
28       # creating the table row in output.html with appropriate information
29       echo "<tr id='colorme$i'>
30       <td id='colortext$i'>${ARRAY[0]}</td>
31       <td id='colortext$i'><a name='"${ARRAY[1]}"' class="tooltip"><i class='fa fa-external-link'></i></a></td>
32       <td id='colortext$i'>${ARRAY[2]}</td>
33       <td id='colortext$i'>${ARRAY[3]}</td>" >> temp/output.html
34       # color these fields in the table based on true/false
35       if [ "${ARRAY[4]}" == "True" ]; then
36           echo "<td id='truec'>${ARRAY[4]}</td>" >> temp/output.html
37       else
38           echo "<td id='falsec'>${ARRAY[4]}</td>" >> temp/output.html
39       fi
```

Test Script (cont.)

```
35      if  [ "${ARRAY[4]}" == "True" ]; then
36          echo "<td id='truec'>${ARRAY[4]}</td>" >> temp/output.html
37      else
38          echo "<td id='falsec'>${ARRAY[4]}</td>" >> temp/output.html
39      fi
40
41      # running actual test and receiving output, must cd for test.py to work
42      cd testCasesExecutables/
43      OUTPUT=$(python test.py ${ARRAY[2]} ${ARRAY[3]})
44      # also t/f color these fields in the table
45      if  [ "$OUTPUT" == "True" ]; then
46          echo "<td id='truec'>$OUTPUT</td>" >> ../temp/output.html
47      else
48          echo "<td id='falsec'>$OUTPUT</td>" >> ../temp/output.html
49      fi
50      cd ..
51
52      # Check if test passed or failed by comparing to oracle and output result in table
53      # color entire row and show icon based on pass/fail
54      if  [ "${ARRAY[4]}" == "$OUTPUT" ]; then
55          echo "<td id='colortext$i'><i class='fa fa-check'></i></td></tr>
56          <style>#colorme$i {background-color: #dff0d8;} #colortext$i {color:#3c763d;}</style>" >> temp/output.html
57      else
58          echo "<td id='colortext$i'><i class='fa fa-close'></i></td></tr>
59          <style>#colorme$i {background-color: #f2dede;} #colortext$i {color:#a94442;}</style>" >> temp/output.html
60      fi
61  done
62
63  # closing off the table
64  echo "</table>" >> temp/output.html
65
66  # open results in browser
67  echo "Tests complete; opening results in default browser."
68  xdg-open temp/output.html 2> /dev/null
```

Lessons Learned