Week 8: Lab 8

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SDEV 300
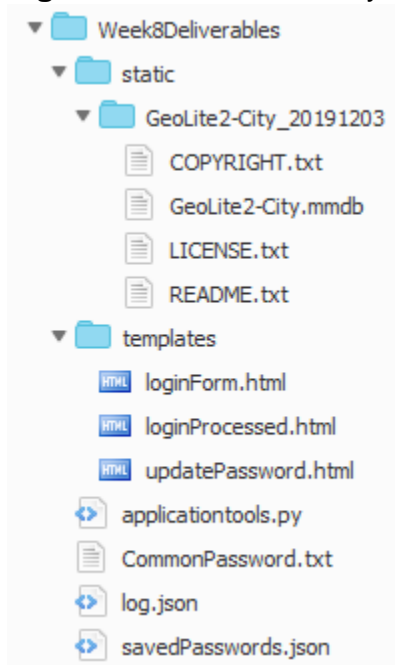
11 December 2019

Python Application Tools

NOTES:

- For this Lab, I used the template you provided and added the following files of my own: **updateForm.html**, **log.json**, **savedPasswords.json**. I also used **CommonPassword.txt**, **GeoLite2-City.mmdb**, **loginForm.html**, and **loginProcessed.html**. My folders look like this:

- I included this whole "Week8Deliverables" folder in my submission. The main Python code to run is the file titled **applicationtools.py**.
- Even if **log.json** and **savedPasswords.json** are missing, the program will create them anyways.
- PRESETS: Username = **Bob**, Password = **HelloWorld1234@!**
- I switched to Arial font for this analysis documentation since all the screenshots already show Times New Roman.

Week 8: Lab 8

HOW IT LOOKS (webpage in browser, 4 routes):

The IPv4 Public IP was 3.92.61.105, so I typed 3.92.61.105.205:8080/ into the search bar. My webpage successfully loaded in my browser.

Week 8: Lab 8

HOW IT LOOKS (code in Cloud9 IDE)


```python
75          Processing login
76          """
77          error_msg = ""
78          ipaddress = request.environ['REMOTE_ADDR']
79
80          # Get form data
81          form = LoginForm(request.form)
82 ▾        if request.method == 'POST' and form.validate():
83              username = request.form['username']
84              password = request.form['password']
85              password_encoded = hashlib.md5(password.encode()).hexdigest()
86
87              # Keeping track of time
88              currenttimeseconds = time.time()
89              eastern = timezone('US/Eastern')
90              rightnow = datetime.now(eastern)
91              today = datetime.today()
92              currenttimeest = str(rightnow.strftime('%H:%M:%S'))
93              currentdateest = str(today.strftime("%B %d, %Y"))
94
95              # After 15 failed attempts, deny login for 5 minutes
96 ▾            if currenttimeseconds <= STARTTIME15ATTEMPTS.value + 300:
97                  STARTTIME15ATTEMPTS.value = currenttimeseconds
98 ▾              with open('Week8Deliverables/log.json', 'r+') as logfile:
99                  logdict = json.load(logfile)
100                 logdict['attemptcount'] += 1
101                 failedstring = 'Failed Attempt'
102                 attempt = [ipaddress, currenttimeest, currentdateest]
103                 logdict.update({failedstring + str(logdict['attemptcount']): ', '.join(attempt)})
104                 logfile.seek(0)
105                 json.dump(logdict, logfile)
106 ▾            if currenttimeseconds < STARTTIMESECONDS.value + 300 and logdict['attemptcount'] > 10:
107                 failedstring = 'Failed Attempt'
108                 geolocate = DbIpCity.get(ipaddress)
109                 print(ipaddress, 'had', logdict['attemptcount'], 'failed login attempts'
110                     ' in a 5 minute period at',
111                     logdict[failedstring + str(logdict['attemptcount'])].strip(ipaddress + ','))
112                 print(ipaddress, 'has a Lat/Long of', geolocate.latitude, '/', geolocate.longitude)
```

bash - "ip-172-31× | Immediate (Javas× | **Week8Deliveral**🔆 ⊕

🟥 Stop ⟳ | [   ] | Command: | Week8Deliverables/applicationtools.py

```
* Serving Flask app "applicationtools" (lazy loading)
* Environment: production
  WARNING: This is a development server. Do not use it in a production deployment.
  Use a production WSGI server instead.
* Debug mode: off
* Running on http://0.0.0.0:8080/ (Press CTRL+C to quit)
```

pylint analysis of Python Application Tools code: 8.90/10 (PASSING)

```
vocstartsoft:~/environment $ pylint Week8Deliverables/applicationtools.py
************* Module applicationtools
Week8Deliverables/applicationtools.py:106:0: C0301: Line too long (102/100) (line-too-long)
Week8Deliverables/applicationtools.py:111:0: C0301: Line too long (102/100) (line-too-long)
Week8Deliverables/applicationtools.py:112:0: C0301: Line too long (103/100) (line-too-long)
Week8Deliverables/applicationtools.py:113:0: C0301: Line too long (114/100) (line-too-long)
Week8Deliverables/applicationtools.py:142:0: C0301: Line too long (105/100) (line-too-long)
Week8Deliverables/applicationtools.py:154:0: C0301: Line too long (101/100) (line-too-long)
Week8Deliverables/applicationtools.py:189:0: C0301: Line too long (102/100) (line-too-long)
Week8Deliverables/applicationtools.py:240:0: C0301: Line too long (111/100) (line-too-long)
Week8Deliverables/applicationtools.py:243:0: C0301: Line too long (129/100) (line-too-long)
Week8Deliverables/applicationtools.py:246:0: C0301: Line too long (119/100) (line-too-long)
Week8Deliverables/applicationtools.py:45:0: R0903: Too few public methods (1/2) (too-few-public-methods)
Week8Deliverables/applicationtools.py:73:0: R0914: Too many local variables (19/15) (too-many-locals)
Week8Deliverables/applicationtools.py:124:16: R1705: Unnecessary "else" after "return" (no-else-return)
Week8Deliverables/applicationtools.py:73:0: R0915: Too many statements (70/50) (too-many-statements)
Week8Deliverables/applicationtools.py:232:28: R1705: Unnecessary "else" after "return" (no-else-return)


--------------------------------------------------------------
Your code has been rated at 8.90/10 (previous run: 8.90/10, +0.00)
```

Week 8: Lab 8

NOTE: Screenshots are under each respective test case. I should've started doing this a long time ago.

Test Case	Input	Expected Output	Actual Output	Pass?
1	(into login form) Press "Clear Form"	Text fields are cleared	Text fields are cleared	Yes

Screenshots before and after pressing "Clear Form":

Username: gsdfgb   Password: ●●●
Submit
Clear Form

Username: Password:
Submit
Clear Form

| 2 | (into login form) Enter wrong username: dfgdf | Return to main login form with error message "Username does not exist. Please try again." | Return to main login form with error message "Username does not exist. Please try again." | Yes |

Username does not exist. Please try again.

Username: dfgdf   Password:
Submit
Clear Form

| 3 | (into login form) Enter wrong password: asdfasd | Return to main login form with error message "Password is incorrect. Please try again." | Return to main login form with error message "Password is incorrect. Please try again." | Yes |

Password is incorrect. Please try again.

Username: Bob   Password:
Submit
Clear Form

Week 8: Lab 8

4	(into login form) Enter correct username and password: "Bob", "HelloWorld1234@!"	Redirect to "loginProcessed" form with correct username and password listed	Redirect to "loginProcessed" form with correct username and password listed	Yes

You successfully logged in.

Username: Bob Password: HelloWorld1234@!

Would you like to change your password?
update password

5	(into loginProcessed page) Press "update password" button	Redirect to "updatePassword" form	Redirect to "updatePassword" form	Yes

Keep in mind, your password must:

- Be at least 8 characters long
- Be no more than 64 characters
- Not be easy-to-guess (for example: "password")

You will be redirected to the login page if your new password is valid.
Current Password: [   ]   New Password: [   ]
Submit
Clear Form

6	(into updatePassword form) Press "Clear form" button	Text fields are cleared	Text fields are cleared	Yes

Screenshots before and after pressing "Clear Form":

Keep in mind, your password must:

- Be at least 8 characters long
- Be no more than 64 characters
- Not be easy-to-guess (for example: "password")

You will be redirected to the login page if your new password is valid.
Current Password: erger   New Password: ●●●●●●
Submit
Clear Form

Keep in mind, your password must:

- Be at least 8 characters long
- Be no more than 64 characters
- Not be easy-to-guess (for example: "password")

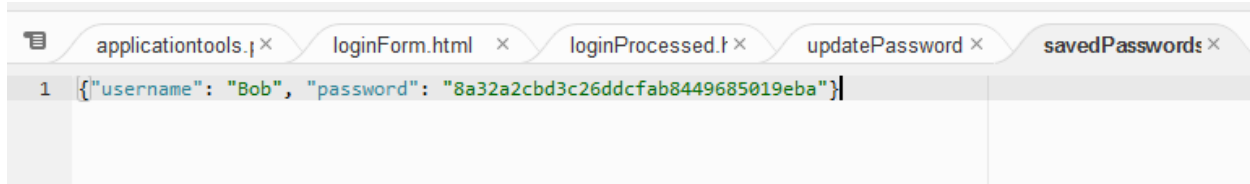You will be redirected to the login page if your new password is valid.
Current Password: New Password:
Submit
Clear Form

7	(into updatePassword form) enter incorrect old password	Return to update form with error message "Old password is incorrect. Please try again."	Return to update form with error message "Old password is incorrect. Please try again."	Yes

Old password is incorrect. Please try again.

Keep in mind, your password must:

- Be at least 8 characters long
- Be no more than 64 characters
- Not be easy-to-guess (for example: "password")

You will be redirected to the login page if your new password is valid.
Current Password: wweww   New Password:
Submit
Clear Form

8	(into updatePassword form) enter new password below 8 characters	Return to update form with error message "Your new password must be at least 8 characters long. Please choose something longer."	Return to update form with error message "Your new password must be at least 8 characters long. Please choose something longer."	Yes

Your new password must be at least 8 characters long. Please choose something longer.

Keep in mind, your password must:

- Be at least 8 characters long
- Be no more than 64 characters
- Not be easy-to-guess (for example: "password")

You will be redirected to the login page if your new password is valid.
Current Password: [HelloWorld1234@!]   New Password: [   ]
[Submit]
[Clear Form]

9	(into updatePassword form) enter new password over 64 characters	Return to update form with error message "Your new password must be no more than 64 characters long. Please choose something shorter."	Return to update form with error message "Your new password must be no more than 64 characters long. Please choose something shorter."	Yes

Your new password must be no more than 64 characters long. Please choose something shorter.

Keep in mind, your password must:

- Be at least 8 characters long
- Be no more than 64 characters
- Not be easy-to-guess (for example: "password")

You will be redirected to the login page if your new password is valid.
Current Password: [HelloWorld1234@!]   New Password: [   ]
[Submit]
[Clear Form]

Week 8: Lab 8

10	(into updatePassword form) enter new password that is in CommonPassword.txt (I entered "jennifer")	Return to update form with error message "This new password is too common. Choose one that is more complex."	Return to update form with error message "This new password is too common. Choose one that is more complex."	Yes

This new password is too common. Choose one that is more complex.

Keep in mind, your password must:

- Be at least 8 characters long
- Be no more than 64 characters
- Not be easy-to-guess (for example: "password")

You will be redirected to the login page if your new password is valid.
Current Password: HelloWorld1234@!   New Password: [   ]

Submit

Clear Form

Week 8: Lab 8

11	(into updatePassword form) enter password that meets requirements (I entered "yeahyeahyeah")	New password is stored, encrypted. Redirect to main login form. New password "yeahyeahyeah" works for logging in.	New password is stored, encrypted. Redirect to main login form. New password "yeahyeahyeah" works for logging in.	Yes

New password is stored, encrypted (this is the correct encryption for "yeahyeahyeah")

	applicationtools.p ×	loginForm.html ×	loginProcessed.h ×	updatePassword ×	savedPasswords ×
1	{"username": "Bob", "password": "8a32a2cbd3c26ddcfab8449685019eba"}				

Redirected to main login form:

Username: [   ]   Password: [   ]
Submit
Clear Form

New password "yeahyeahyeah" works for logging in:

You successfully logged in.

Username: Bob Password: yeahyeahyeah

Would you like to change your password?
update password

12	(into login form) make 16 failed login attempts	redirect to "too_many_attempts" page, displays "You made over 15 failed login attempts. Try again in 5 minutes." with a button to return to login page	redirect to "too_many_attempts" page, displays "You made over 15 failed login attempts. Try again in 5 minutes." with a button to return to login page	Yes

You made over 15 failed login attempts. Try again in 5 minutes.

return to login page

Week 8: Lab 8

13	(into "too many attempt" page) press "return to login page" button	redirect to login form	redirect to login form	Yes

Username: [   ]   Password: [   ]
Submit
Clear Form

14	(into login form) make another login attempt before 5 minutes have passed	Return to main login form with error message "It has not been at least 5 minutes since previous failed attempt. Please wait 5 minutes."	Return to main login form with error message "It has not been at least 5 minutes since previous failed attempt. Please wait 5 minutes."	Yes

Timer for denying login for 5 minutes starts here. Until the 5 minutes is up, whenever another attempt is made, the timer resets and the subscriber must wait for 5 minutes again.

It has not been at least 5 minutes since previous failed attempt. Please wait 5 minutes.

Username: sgsdg   Password: [   ]
Submit
Clear Form

15	(into login form) WAIT 5 minutes after previous failed attempt, make a failed attempt	Return to main login form with error message "Password is incorrect. Please try again." No error message about waiting 5 minutes.	Return to main login form with error message "Password is incorrect. Please try again." No error message about waiting 5 minutes.	Yes

Password is incorrect. Please try again.

Username: Bob   Password: [   ]
Submit
Clear Form

Week 8: Lab 8

| 16 | (into login form) WAIT 5 minutes after previous failed attempt, make a correct attempt | Login successful, Redirect to "loginProcessed" form with correct username and password listed | Login successful, Redirect to "loginProcessed" form with correct username and password listed | Yes |

You successfully logged in.

Username: Bob Password: HelloWorld1234@!

Would you like to change your password?
update password

| 17 | (into login form) make 1 failed attempt | log.json shows the date, time, and IP address for Failed Attempt 1 | log.json shows the date, time, and IP address for Failed Attempt 1 | Yes |

applicationtools.| ×   loginForm.html ×   loginProcessed.l×   updatePassword ×   savedPasswords ×   **log.json**   ×

1 {"IP Address": "151.200.247.128", "attemptcount": 1, "Failed Attempt1": "151.200.247.128, 00:57:43, December 13, 2019"}

Week 8: Lab 8

18	(into login form) make 11th failed attempt in 5 minute period	log.json shows the date, time, and IP address for Failed attempt 11. Logger statements are printed into the console: 151.200.247.128 had 11 failed login attempts in a 5 minute period at 00:51:53, December 13, 2019 151.200.247.128 has a Lat/Long of 38.8948932 / -77.0365529	log.json shows the date, time, and IP address for Failed attempt 11. Logger statements are printed into the console: 151.200.247.128 had 11 failed login attempts in a 5 minute period at 00:51:53, December 13, 2019 151.200.247.128 has a Lat/Long of 38.8948932 / -77.0365529	Yes

Screenshots of updated log.json and console:

Week 8: Lab 8

19	(into login form) make 13th failed attempt in 5 minute period	log.json shows the date, time, and IP address for Failed attempt 13. Logger statements are printed into the console: 151.200.247.128 had 13 failed login attempts in a 5 minute period at 00:52:36, December 13, 2019 151.200.247.128 has a Lat/Long of 38.8948932 / -77.0365529	log.json shows the date, time, and IP address for Failed attempt 13. Logger statements are printed into the console: 151.200.247.128 had 13 failed login attempts in a 5 minute period at 00:52:36, December 13, 2019 151.200.247.128 has a Lat/Long of 38.8948932 / -77.0365529	Yes

Screenshots of updated log.json and console:

Week 8: Lab 8

20	(into login form) make another login attempt before 5 minutes have passed	Treated as a failed attempt, whether the input is correct or not. log.json shows the date, time, and IP address for new Failed attempt (17). Logger statements are printed into the console: 151.200.247.128 had 17 failed login attempts in a 5 minute period at 01:09:00, December 13, 2019 151.200.247.128 has a Lat/Long of 38.8948932 / -77.0365529	Treated as a failed attempt, whether the input is correct or not. log.json shows the date, time, and IP address for new Failed attempt (17). Logger statements are printed into the console: 151.200.247.128 had 17 failed login attempts in a 5 minute period at 01:09:00, December 13, 2019 151.200.247.128 has a Lat/Long of 38.8948932 / -77.0365529	Yes

"Failed Attempt16": "151.200.247.128, 01:08:51, December 13, 2019", "Failed Attempt17": "151.200.247.128, 01:09:00, December 13, 2019"}

```
151.200.247.128 had 17 failed login attempts in a 5 minute period at  01:09:00, December 13, 2019
151.200.247.128 has a Lat/Long of 38.8948932 / -77.0365529
151.200.247.128 - - [13/Dec/2019 06:09:01] "POST /process_login HTTP/1.1" 200 -
```

21	(into login form) make 2 failed attempts, then correct input	Counter for failed attempts for subscriber reset to 0. However, details for previous failed attempts in the log REMAIN.	Counter for failed attempts for subscriber reset to 0. However, details for previous failed attempts in the log REMAIN.	Yes

Screenshots of BEFORE and AFTER the correct input: Attempt counter is reset to 0, but previous failed attempt details remain.

1 {"IP Address": "151.200.247.128", "attemptcount": 2, "Failed Attempt1": "151.200.247.128, 01:14:50, December 13, 2019", "Failed Attempt2": "151.200.247.128, 01:14:52, December 13, 2019"}

1 {"IP Address": "151.200.247.128", "attemptcount": 0, "Failed Attempt1": "151.200.247.128, 01:14:50, December 13, 2019", "Failed Attempt2": "151.200.247.128, 01:14:52, December 13, 2019"}

Week 8: Lab 8

<u>Secret Message Decryption</u>

a. - .... / ... -.. . ...- / ...-- ----- ----- / -.-. .-.. .- ... ... / .... .- ... / ... --- -- . / ... - .-. .- -. . -
-. . / .-. . --.- ..- . ... - ... .-.-.-
   is in **Morse Code**. When decoded, it says:

   THIS/SDEV/300/CLASS/HAS/SOME/STRANGE/REQUESTS.

   I narrowed it down to Morse Code from seeing the use of dots and dashes.

b. U28gdGhpcyBpcyBiYXNlNjQuIE5vdyBJIGtub3cu
   is in **Base64**. When decoded, it says:

   So this is base64. Now I know.

   I narrowed it down to Base64 after seeing that it was a jumble of uppercase and lowercase letters with some numbers.

c. --- Psuwb Ysm ----
   W oa gc qzsjsf. Bc cbs qcizr dcggwpzm twuifs hvwg cih.
   --- Sbr Ysm ---
   is in **Caesarian shift**. When decoded, it says:

   --- Begin Key ----
   I am so clever. No one could possibly figure this out.
   --- End Key ---

   I narrowed it down to Caesarian Shift after seeing that it seemed like a normal sentence using the English alphabet, just with substituted letters. Uppercase letters were at the lead of each "sentence", followed by lowercase letters. Then, it was just a matter of using rumkin.com and going through each value of "N" to see which would turn decode the sentence into some sensible message. The result was **N = 12 for decryption**.