Lab 6: Session Data in Flask

GW CS 2541W: Database Systems and Team Projects - 2024

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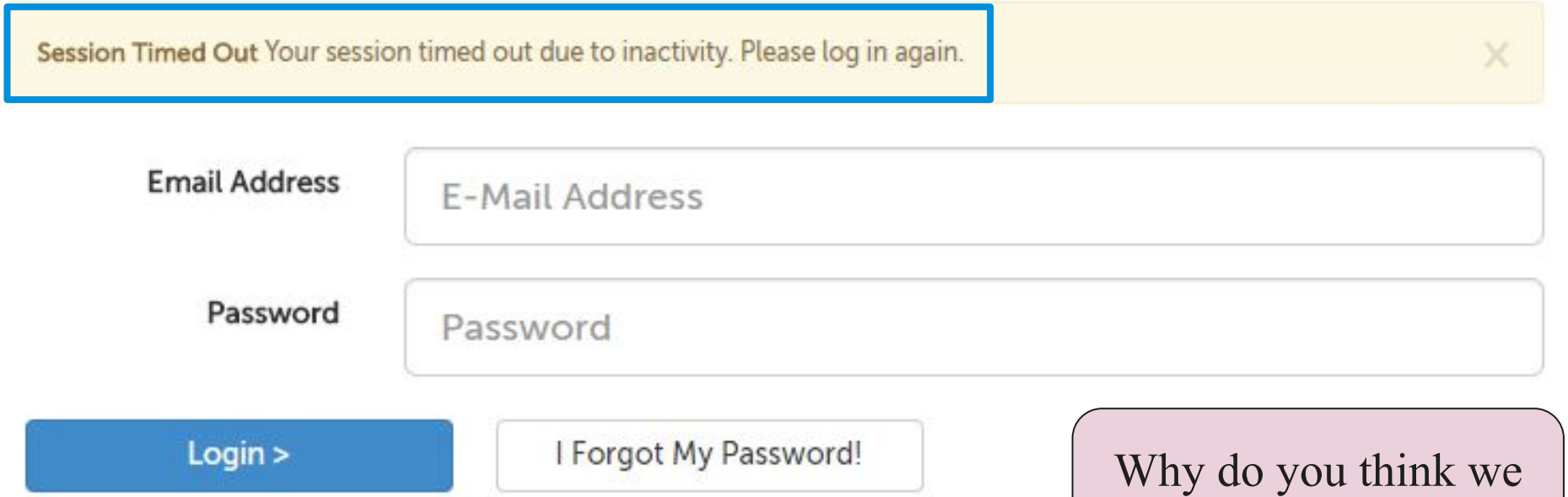
Has this ever happened to you?



Why do you think we need this feature?

Session Data

- “Session” refers to the time between a client logging in to the server and logging out of the server
- With Flask, Session data is stored in the client’s browser on top of cookies
- Each client has their own session that is assigned a **Session ID**
- Use Cases
  - Remember a user when they log in
  - Store items in a cart while shopping online
- Sessions last for 31 days unless SESSION_PERMANENT is set to false (in which case they last until the browser or tab is closed)

Using Session with Flask

- The Session object is a dictionary object with key-value pairs of session variables and associated values
- For session data to be encrypted, also set a SECRET_KEY

To set a **'username'** session variable:

```
session['username'] = "admin"
```

To release a session variable:

```
session.pop('username', None)
```

To set the session secret key:

```
app.secret_key = "any string"
```

To clear all session variables:

```
session.clear()
```

Redirecting in Flask

```
from flask import Flask, redirect, url_for
app = Flask('app')

@app.route('/')
def login():
      ...

@app.route('/logout')
def logout():
      session.clear()
      return redirect('/')

app.run(host='0.0.0.0', port=8080)
```

- The redirect() function allows us to redirect users to a URL that we specify
- Instead of specifying a URL, we can also redirect to a function using url_for()
- For example, the following lines would be equivalent for our code example:

```
redirect('/')
```

```
redirect(url_for('login'))
```

Session Example

```
from flask import Flask, session, redirect
app = Flask('app')
app.secret_key = "secret"

...
@app.route('/home')
def home():
      if 'name' in session:
            return render_template("home.html")
      return redirect('/')

app.run(host='0.0.0.0', port=8080)
```

Why do we check the session to make sure a user is logged in?

home.html

```
<html>
<body>
      <h1> Welcome, {{ session['name'] }} </h1
</body>
</html>
```

We can access our session variables in templates, too!

Session Refresher

- Session data allows us to temporarily store data that we want to preserve across different pages (i.e. a logged in user or a shopping cart of products)

Setting session variables:

```
session['username'] = "admin"
```

Checking if a session variable is set:

```
if 'username' in session:
```

Clearing session variables:

```
session.pop('username')
session.clear()
```

Using session variables in templates:

```
<p> Hello, {{ session['username'] }} </p>
```

Refresher: Form Data

```
from flask import Flask, render_template, request
app = Flask('app')

@app.route('/', methods=['GET', 'POST'])
def get_username():
      if request.method == 'POST':
            uname = request.form["username"]
      return render_template('simple_form.html')
 app.run(host='0.0.0.0', port=8080)
```

```
<body>
 <form action="/" method="POST">
   <input type="text" name="username">
   <input type="submit" name="submit">
 </form>
</body>
```

Common Mistakes & Tips!

1. You must set up your database connection and create a cursor object **within each function** in your Flask app
2. If you are getting a Python indentation / tab error but everything looks aligned on your screen, this is likely due to a collaboration lag in Repl. Have every group member check the spacing on their own screen and adjust!
3. If you want styling tips or aren't sure about syntax for HTML / CSS, w3schools.com is a great resource!
4. If you need to reset your database, run the following command in the **Shell**:

```
sqlite3 <db file name> ".read <sql file name>"
```

Activity 1: Login Page

1. Create a login page (*login.html*) that takes a username and password, verifies the user is in the database, and signs them in
   - Display an error message on the login page if authentication fails
2. Upon successful login, the user should be redirected to a homepage (*home.html*) that displays "Welcome, <NAME> " at the top (using **session variables**!)
   - Add a Sign Out button on the homepage that clears the session and redirects the user back to the login page
   - Users should not be able to access the home page if not signed in

Activity 2: User Login

1. Extend Activity 1 so that when a username and password are determined to be in the database, also store the type of user in a session variable (The three user roles are: Student, TA, and Professor)
2. When signed in, the home page (*home.html*) should display different things based on the type of user stored in the session
    - Students can view the student roster (name, ID, and email of all students)
    - TAs can view the student roster and engagement points
    - Professors can view the student roster, engagement points, and grades