Web Programming
Login

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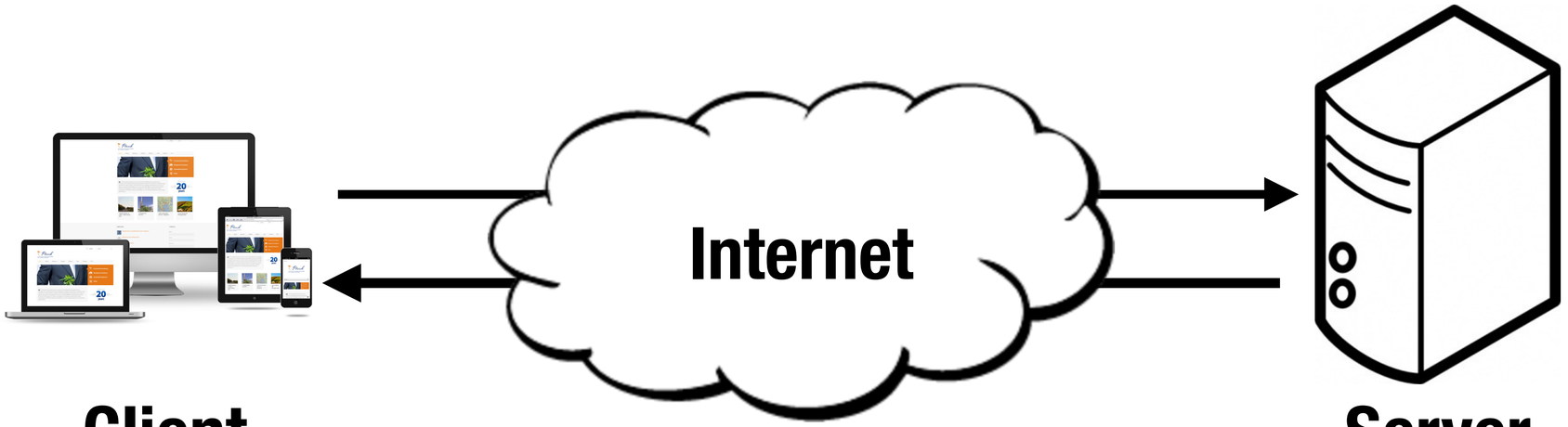
Login

- This lecture: Simple login using sessions.
  - Has some security flaws
- Deployment alternatives:
  - Flask-Login
  - OAuth provider, e.g. firebase.google.com

Storing data

Files

Database



Client

Server

Cookie

Session

Storing Passwords

- Do not store passwords in plaintext
- When application/server is compromised, all passwords will be stolen.
- Affects other sites.

Password Hashes

- One way function

`“In goes a string of arbitrary length”`

Out comes fixed size string

`“628649fb210… “`

Password Hashes

```
from werkzeug.security import generate_password_hash, check_password_hash
```

- Create a salted password hash to store

```
hash = generate_password_hash("Joe123")
```

```
"pbkdf2:sha256:150000$oMxlb0Oa$125a8c19b39e0fc7e903e7775a45e40667663ed01382f9b5adcb5e0eb3d80937"
```

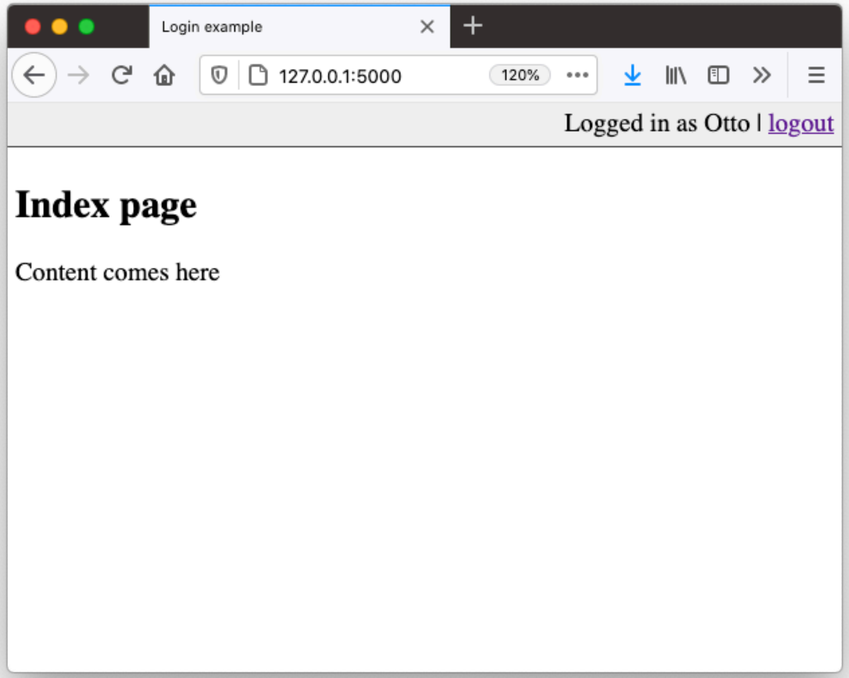
Includes a random **salt**, so no two passwords have the same hash

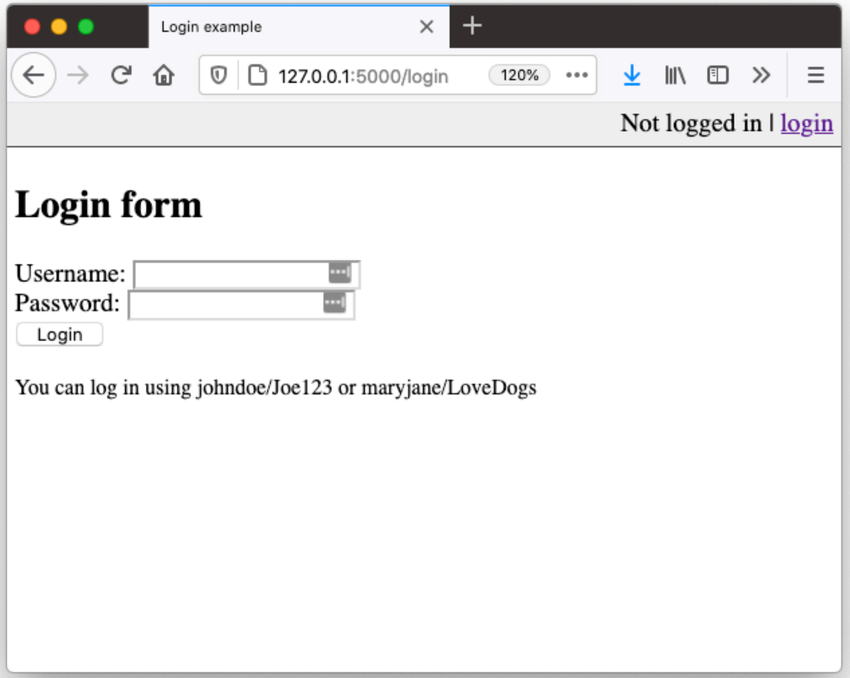
- Check password

```
ok = check_password_hash(hash,”Joe123")
```

Example

examples/python/flask/9_login/app.py





Example

examples/python/flask/9_login/app.py

- on login, check password hash and add username to session

```
@app.route("/login", methods=["GET", "POST"])
def login():
    username = request.form["username"]
    password = request.form["password"]

    if valid_login(username,password):
        session["username"] = username
        return redirect(url_for("index"))
```

Example

examples/python/flask/9_login/app.py

- on logout, remove username from session

```
@app.route("/logout")
def logout():
    session.pop("username")
    return redirect(url_for("index"))
```

Exercise #1, #2, #3

github.com/dat310-2025/info/tree/master/
exercises/python/flask5

Walkthrough in lecture!

Exercise #1 Solution

github.com/dat310-2023/info/tree/master/
solutions/python/flask5

- Use id instead of username

```
"userid INTEGER PRIMARY KEY"
```

- Id is generated on insert

```
sql = ("INSERT INTO users (username, passwordhash) VALUES (?,?)")
cur.execute(sql, (username, hash))
conn.commit()
return cur.lastrowid
```

- Separate functions for user details and pw_hash

```
def get_user_by_name(conn, username):

def get_hash_for_login(conn, username):
```

Exercise #2 Solution

github.com/dat310-2023/info/tree/master/
solutions/python/flask5

- Relies on UNIQUE for checking dublicates

```
    conn = get_db()
    id = add_user(conn, username, hash)
    if id == -1:
        flash("Username already taken")
```

Exercise #3 Solution

github.com/dat310-2023/info/tree/master/
solutions/python/flask5

- Store role on session:

```
if not session.get("role",None) == "admin":
    abort(403)
```

Cross-site request forgery (CSRF)

- A web security flaw
- Attacker induces user to make unintended actions
  - e.g. change email

```
app.config.update(
    SESSION_COOKIE_HTTPONLY=True,
    # do not allow to access session in JS
    REMEMBER_COOKIE_HTTPONLY=True,
    SESSION_COOKIE_SAMESITE="Strict",
)
```

Set SAMESITE=“Strict” on session cookies to prevent most CSRF.

Limitation

- To further improve security session should include:
  - Unique token for every time you login
- Further, requests should contain CSRF token.
  - https://owasp.org/www-community/attacks/csrf
  - https://portswigger.net/web-security/csrf