

INF1343, Winter 2012

Data Modeling and Database Design

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Week 8

**Building
Database-Driven
Web Applications**

Interactivity

```
template = "Greetings, %s from %s!"
query_template = """select * from persona
where name="%s";"""
name = raw_input("What is your name? ")
query = fill_template(query_template, name)
execute_query(query)
for row in fetch_all_rows():
    world = get_row_value(row, "homeworld")
    if world==None:
        print greeting + name
    else:
        print fill_template(template,
                               name, world)
```

(We stopped here in class.)

Or Rather

```
template = "Greetings, %s from %s!"
query_template = """select * from persona
where name="%s";"""
name = raw_input("What is your name? ")
query = fill_template(query_template, name)
execute_query(query)

if get_row_count() > 0 :
    rows = fetch_all_rows()
    row = rows[0]
    world = get_row_value(row, "homeworld")
    if world==None:
        print greeting + name
    else:
        print fill_template(template, name, world)
else :
    print "No such user!"
```

Worlds as Passwords

```
template = "Greetings, %s from %s!"
query_template = """select * from persona
where name="%s";"""
name = raw_input("What is your name? ")
world = raw_input("Where are you from? ")
query = fill_template(query_template, name)
execute_query(query)

if get_row_count() > 0 :
    rows = fetch_all_rows()
    row = rows[0]
    real_world = get_row_value(row, "homeworld")
    if world==real_world:
        print fill_template(template, name, world)
    else:
        print "Access denied!"
else :
    print "No such user!"
```

Worlds as Passwords

```
template = "Greetings, %s from %s!"
query_template = """select * from persona
where name="%s";"""
name = raw_input("What is your name? ")
world = raw_input("Where are you from? ")
query = fill_template(query_template, name)
execute_query(query)

if get_row_count() > 0 :
    rows = fetch_all_rows()
    row = rows[0]
    real_world = get_row_value(row, "homeworld")
    if world==real_world:
        print fill_template(template, name, world)
else :
    print "Access denied!"
```

Worlds as Passwords

```
template = "Greetings, %s from %s!"
query_template = """select * from persona
where name="%s" and world="%s";"""
name = raw_input("What is your name? ")
world = raw_input("Where are you from? ")
query = fill_template(query_template, name, world)
execute_query(query)

if get_row_count() > 0 :
    print fill_template(template, name, world)

else :
    print "Access denied!"
```

What about Inserts?

```
from padawan import *
connect_to_db("okenobi", "okenobi")
query_template = """insert into persona(name)
values ("%s");"""
name = raw_input("What is your name? ")
query = fill_template(query_template, name)
execute_query(query)

print "You are now in our database!"
```


'%' in Queries

```
from padawan import *
connect_to_db("okenobi", "okenobi")
query_template = """select * from persona
where name like "%%s%%";"""
name = raw_input("What is your name? ")
query = fill_template(query_template, name)
print query
```

Use %% in the template when you want to have % in the query:

like "%s%" → like "%Bob%"

Email

Keep me logged in

Password

Login

[Forgot your password?](#)

Sign Up

MySQL at Facebook is on Facebook

Sign up for Facebook to connect with MySQL at Facebook.



Devoted to making MySQL better. Written by people who work at Facebook.

Information

Founded:
2009

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Martin
Prayoga

MySQL at Facebook



Wall

Info

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MySQL at Facebook + Others

Just MySQL at Facebook

Just Others



MySQL at Facebook I just registered for PgWest 2010. I look forward to learning more about current work on PostgreSQL.



PgWest 2010 | The PostgreSQL Conference
www.postgresqlconference.org

Thursday at 12:18pm · Comment · Like

Paul Saab, Bill Blum, Chetan Tanna and 51 others like this.

View all 7 comments



MySQL at Facebook I think they both have awesome technology and continue to improve.
Yesterday at 9:24am · 2 people · Flag



Ricky Elrod Indeed they do, I was just pulling your leg. Have fun at the conference :)
Yesterday at 9:26am · Flag



MySQL at Facebook Kristian Nielsen had a very interesting presentation on making replication better in MariaDB. Perhaps one day he will share that (hint, hint).

October 11 at 8:21am · Comment · Like

Kian Sin Teo, Donald G. Lane Jr., Roja Rani Penmetsa and 38 others like this.

Telnet (1969)



"r2", "alice", "pumpkins"

"alice", "pumpkins"

ok

"alice@r2:~\$"

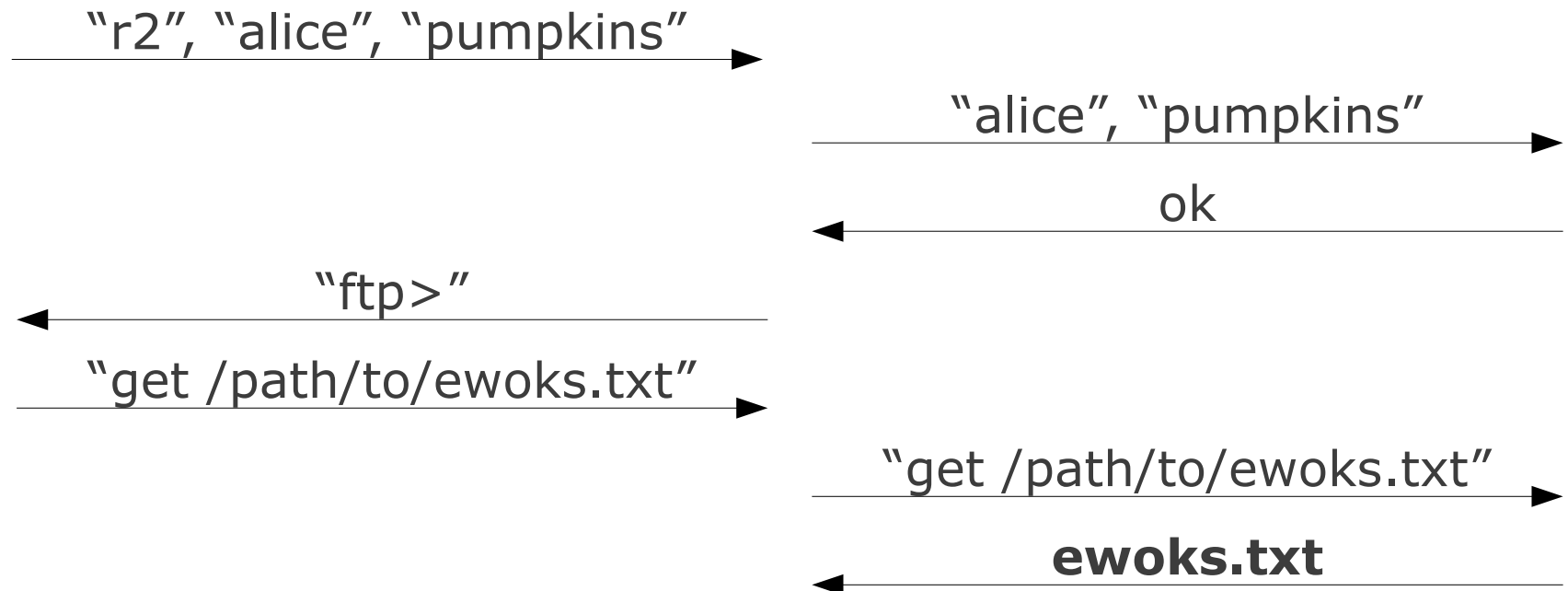
"python greetings.py"

"python greetings.py"

"What is your name?"

"What is your name?"

FTP (1971)



the file is saved locally

Anonymous FTP



"r2", "/path/to/ewoks.txt"

"get /path/to/ewoks.txt"

ewoks.txt

the file is saved locally

ftp://yoda/path/to/ewoks.txt

HTTP (1991)



"r2", "/path/to/ewoks.html" →

"GET /path/to/ewoks.html" →

← the **content** of ewoks.html

← ewoks.html is displayed

`http://yoda/path/to/ewoks.html`

HTML

```
<html xmlns="http://www.w3.org/1999/xhtml">
  <head>
    <title>
      Ewoks
    </title>
  </head>
  <body>
    <h1>
      The List of Ewoks
    </h1>
    ...
  </body>
</html>
```

See: <http://www.w3schools.com/html/default.asp>

Basic Web Setup

1. Create an HTML file.

Call it "test.html".

2. Put it in ~/public_html.

Use an SCP client.

~ = your home directory.

3. Set permissions.

Make the file readable by "other".

4. Access it in the browser.

<http://r2.ischool.utoronto.ca/~okenobi/test.html>

(Replace "okenobi" with your username.)

Generated HTML

```
from padawan import *
connect_to_db("starwars", "okenobi")
query = "select * from persona"
execute_query(query)
html_template = """
<p><b>%s</b> is from <b>%s</b></p>
"""
for row in fetch_all_rows():
    name = get_row_value(row, "name")
    world = get_row_value(row, "homeworld")
    if world!=None:
        print fill_template(html_template,
                             name, world)
```

Run with Redirection

```
python personas.py > ~/public_html/personas.html
```

(You can use WinSCP to check that the file ended up in the right place and that the permissions are correct.)

CGI



`"r2", "/path/to/ewoks.py"`

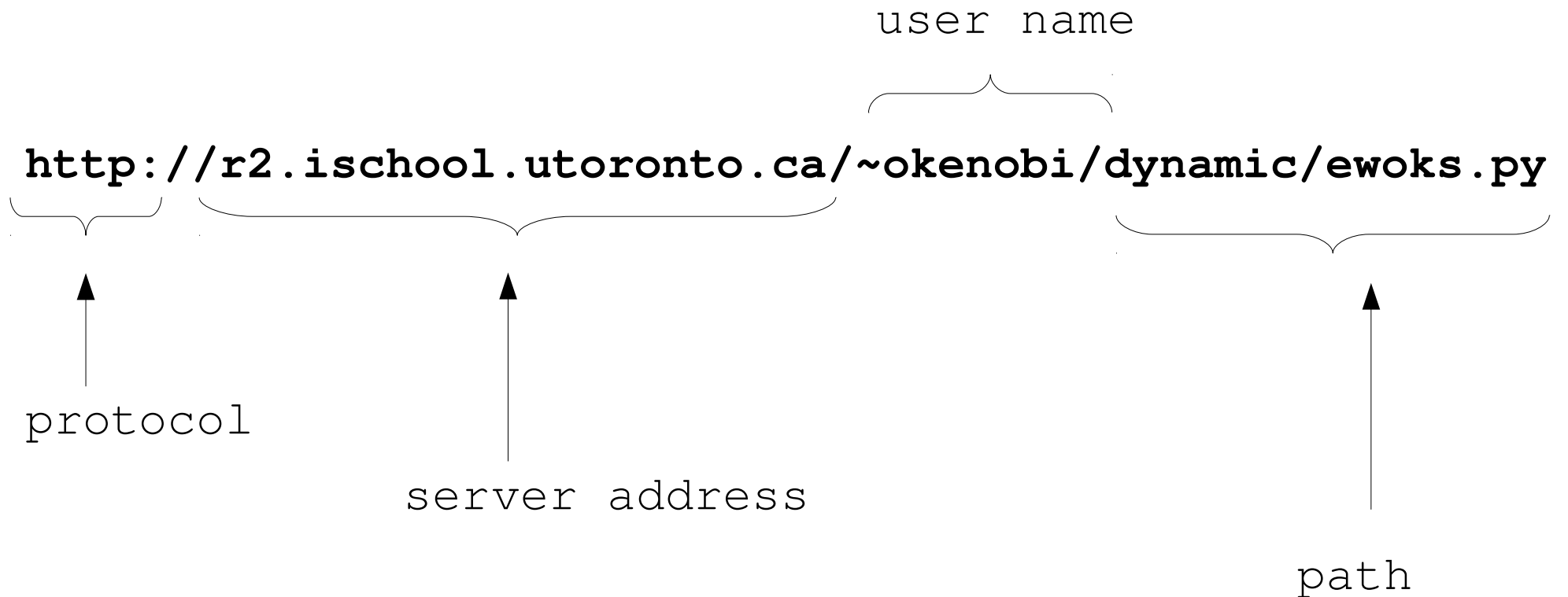
`"GET /path/to/ewoks.cgi"`

the html output of ewoks.py

html output is displayed

ewoks.py contains **code**, but **returns** HTML

personas.py



personas.py

```
#!/usr/bin/python  
  
print "Content-Type: text/html"  
print  
print "<h1>Personas</h1>"
```

Again, create locally, copy to r2 with WinSCP.
The file should be in `~/public_html/dynamic`.

Set permissions to allow "other" and "group"
to **read** and **execute** but *not* to **write**.

CGI with Padawan

```
#!/usr/bin/padawan
print "Content-Type: text/html; encoding=utf8"
print
connect_to_db("starwars", "okenobi")
query = "select * from persona"
execute_query(query)
html_template = """
<p><b>%s</b> is from <b>%s</b></p>
"""
for row in fetch_all_rows():
    name = get_row_value(row, "name")
    world = get_row_value(row, "homeworld")
    if world!=None:
        print fill_template(html_template,
                            name, world)
```

Passing Parameters

Option 1, "GET" (in the URL)

<http://r2.ischool.utoronto.ca/~okenobi/dynamic/personas.py?species=Human>

`.../personas.py?species=Human`

Option 2, "POST" (invisibly)

(we'll get back to this)

Accessing Parameters

```
print_form()
```

```
if form_has_field("species") :  
    print "Species is defined!"
```

```
else :  
    print "Species is not defined. : ("
```

```
s = get_form_field_value("species")  
print "The species is " + s
```


The Wrong Way

```
template = """
select * from persona
where species='%s';
"""
```

Wrong!!!

```
if form_has_field("species") :
    s = get_form_field_value("species")
    query = fill_template(template, s)
    print query
    execute_query(query);
    count = get_row_count()
    print "Got ", count, "results!"
```

Here Is Why

[http://r2.ischool.utoronto.ca/~okenobi/dynamic/personas.py?](http://r2.ischool.utoronto.ca/~okenobi/dynamic/personas.py?species=Human%3Binsert+into+persona+(name,species)+values+('X','Human')%3Bselect+*+from+persona+where+)

[species=Human%3Binsert+into+persona+\(name,species\)+values+\('X','Human'\)%3Bselect+*+from+persona+where+](http://r2.ischool.utoronto.ca/~okenobi/dynamic/personas.py?species=Human%3Binsert+into+persona+(name,species)+values+('X','Human')%3Bselect+*+from+persona+where+)

Right

```
template = """
select * from persona
where species='%s';
"""

if form_has_field("species") :
    s = get_form_field_value("species")
    safe_s = escape_string(s)
    query = fill_template(template,
                          safe_s)

    print query
    execute_query(query);
    count = get_row_count()
    print "Got ", count, "results!"
```

HTML Forms

```
<form action="/~okenobi/dynamic/personas.py"
      method="get">
  Please select a species:
  <input type="text" name="species" />
  <input type="submit" />
</form>
```

HTML Forms

```
<form action="/~okenobi/dynamic/personas.py"
      method="get">
  Please select a species:
  <select name="species">
    <option value="Human">Human</option>
    <option value="Ewok">Ewok</option>
    <option value="Wookiee">Wookiee</option>
  </select>
  <input type="submit" />
</form>
```

HTML Forms: POST

```
<form action="/~kenobio1/cgi-bin/personas3.cgi"
      method="post">
  Please select a species:
  <select name="species">
    <option value="Human">Human</option>
    <option value="Ewok">Ewok</option>
    <option value="Wookiee">Wookiee</option>
  </select>
  <input type="submit" />
</form>
```



initial request (a URL)

an HTML page with a form

a new request (another URL)

an HTML page with a form

a request with parameters

an HTML page with hidden form elements

a request with parameters

an HTML page with hidden form elements



Prefilled Forms

Please select a species:

```
<input type="text" name="species"  
  value="Human" />
```


Hidden Elements

Please select a species:

```
<input type="hidden" name="species"  
value="Human" />
```

Or Just in Links

```
<a href="dynamic/personas.py?species=Human">  
Click here for the Humans  
</a>
```

Questions?