Week 9
last time
Python
def main():
    print("hello, world")

if __name__ == "__main__":
    main()
Flask
web development,
one drop at a time
from flask import Flask, render_template

app = Flask(__name__)

@app.route("/")
def index():
    return render_template("index.html")
<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CREATE . . .

INSERT . . .

SELECT . . .

UPDATE . . .

DELETE . . .

. . .
CREATE TABLE 'registrants'
    ('id' INTEGER PRIMARY KEY, 'name' TEXT, 'dorm' TEXT)

INSERT INTO 'registrants' (name, dorm)
    VALUES('David', 'Matthews')

SELECT * FROM 'registrants'

UPDATE 'registrants' SET name = 'David Malan' WHERE id = 1

DELETE FROM 'registrants' WHERE id = 1

...
PRIMARY KEY
UNIQUE
INDEX
NOT NULL
FOREIGN KEY
...
...
db = cs50.SQL("sqlite:///lecture.db")
SQL injection attack
Login required

You may establish Yale authentication now in order to access protected services later.

NetID: 

Password: 

Warn me before logging me in to other sites.

Login
Please Log In

To log in, please select your login type from the tabs below and enter your credentials. If you’re not sure what login type to use, look here for how you login with HarvardKey.

<table>
<thead>
<tr>
<th>HarvardKey</th>
<th>HUID</th>
<th>eCommons</th>
<th>XID</th>
</tr>
</thead>
</table>

Login Name (in the form of an email address):

me@exampleemailprovider.com

Password:

Login
Please Log In

To log in, please select your login type from the tabs below and enter your credentials. If you’re not sure what login type to use, look here for how you login with HarvardKey.

<table>
<thead>
<tr>
<th>HarvardKey</th>
<th>HUID</th>
<th>eCommons</th>
<th>XID</th>
</tr>
</thead>
</table>

Login Name (in the form of an email address):

me@exampleemailprovider.com

Password:

' OR '1' = '1
username = request.form["username"]
password = request.form["password"]

db.execute("SELECT * FROM users
WHERE username = '{0}' AND password = '{1}'".format(username, password))
username = request.form["username"]
password = request.form["password"]

db.execute("SELECT * FROM users
WHERE username = 'me@examplemailprovider.com' AND password = '__OR '1' = '1'"
username = request.form["username"]
password = request.form["password"]

db.execute("SELECT * FROM users
WHERE username = 'me@examplemailprovider.com' AND password = '__OR '1' = '1'\n")
username = request.form["username"]
password = request.form["password"]

db.execute("SELECT * FROM users
WHERE username = :username AND password = :password", username=username, password=password)
username = request.form["username"]
password = request.form["password"]

db.execute("SELECT * FROM users
WHERE username = 'me@examplemailprovider.com' AND password = '\1 OR \1\1 = \1'")
Hi, this is your son's school. We're having some computer trouble.

Oh, dear - did he break something? In a way...

Did you really name your son Robert'); DROP TABLE Students;-- ?

Oh, yes. Little Bobby Tables, we call him.

Well, we've lost this year's student records. I hope you're happy.

And I hope you've learned to sanitize your database inputs.
Week 9