Let's Learn Python!

Young Coders at PyCon 2016

Meet your teachers:

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What we're doing today

- An overview of the basics
- Automating things with scripts
- Building a web site
- Making some games?

Let's talk to Python!

Math

Try doing some math
at the prompt:

```
>>> 1 + 2
>>> 12 - 3
>>> 9 + 5 - 15
>>> 6 * 5
>>> 10 * 5 * 3
>>> 6 / 2
```

Floats (decimals):

```
>>> 10/2
5.0
```

Integers:

```
>>> round(10/2)
5
```

Math

Comparison operators:

==	Equal to
!=	Not equal to
<	Less than
>	Greater than
<=	Less than or equal to
>=	Greater than or equal to

Practice:

```
>>> 5 < 4 + 3
>>> 12 + 1 >= 12
>>> 16 * 2 == 32
>>> 16 != 16
>>> 5 >= 6
```

Strings

A few examples:

```
>>> 'Hello!'
>>> '3 + 5'
```

What if you have a quote in your string?:

```
>>> 'When\'s lunch?'
>>> "When's lunch?"
```

Another way to return a string:

```
>>> print("Hello")
>>> print("Hello"[1])
```

Try typing one without quotes:

```
>>> apple
```

Strings

Concatenation:

```
>>> "Hi" + "there!"
```

Multiplying:

```
>>> "HAHA" * 250
```

Can you use other math operators on strings?

```
>>> "Hi" - "there"
>>> "Hi" / "there"
>>> "Hi" > "there"
```

Variables

Calculate a value:

```
>>> 12 * 12
 144
```

Store the value, give it a name:

```
>>> donuts = 12 * 12
>>> donuts
 144
```

Create a new variable,
give it a string value:

```
>>> color = "yellow"
>>> color
 'yellow'
```

Assign new values:

```
>>> color = "red"
>>> color = "fish"
>>> color = 12
```

Variables

Math operations

```
>>> donuts = 12 * 12
>>> fishes = 3
>>> fishes + donuts
```

String operations

```
>>> color = "yellow"
>>> day = “Monday”
>>> color + day
>>> color * fishes
>>> color + day * fishes
>>> (color + day) * fishes
```

Get an index from a string:

```
>>> fruit = "watermelon"
>>> print (fruit[2])
    't'
```

Do some math to get the index:

```
>>> mynum = 3
>>> print (fruit[mynum-2])
    'a'
```

Variables

Assigning values or making comparisons?

```
>>> fruit = "watermelon"
>>> 5 = 6


>>> fruit == "watermelon"
>>> 5 == 6
```

Errors

```
>>> "friend" + 5
Error

Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
TypeError: Can't convert 'int' object to str implicitly
```

What if we make 5 a string?

```
>>> "friend" + "5"
friend5
```

Errors

```
>>> 5 + "friend"
Error

Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
TypeError: unsupported operand type(s) for +: 'int' and 'str'
```

How can we fix this expression?

```
>>> 5 + len("friend")
11

>>> print(5, "friend")
5 friend
```

Data types

```
>>> type("Hi!")
<class ‘str'>
```

```
>>> type(27)
<class 'int'>
```

```
>>> type(15.238)
<class 'float'>
```

Is 1 equal to 1?

```
>>> 1 == 1
True
```

Is 15 less than 5?

```
>>> 15 < 5
False
```

```
>>> type(True)
<class ‘bool'>
>>> type(False)
<class 'bool'>
```

Data type: Booleans

What happens when we type Boolean values in the interpreter?

```
>>> True
>>> False
>>> true
>>> false
>>> type(True)
>>> type("True")
```

When the words 'True' and 'False' begin with *upper case* letters, Python knows to treat them like Booleans, not strings or integers.

Data type: Booleans

```
>>> 1==1 and 2==2
True

>>> 1==1 and 2==3
False

>>> 1==2 and 2==3
False
```

```
>>> 1==1 or 2==2
True

>>> 1==1 or 2!=2
True

>>> 1==2 or 2==3
False
```

```
>>> 1==1
True

>>> not 1==1
False

>>> not True
False
```

Data type: list

```
>>> fruit = ["apple", "banana", "grape"]
>>> numbers = [3, 17, -4, 8.8, 1]
>>> mylist = [1, "blue", 1.8]
>>> otherlist = [fruit, numbers, mylist]
```

```
>>> type(mylist)
<class ‘list'>

>>> fruit[0]
'apple'

['apple', 'banana', 'grape']
    0          1          2
```

Data type: dict

```
>>> mydict = {'mykey1':'apple', 'mykey2':3, ‘mykey3’:mylist}

>>> type(mydict)
<class ‘dict'>

>>> mydict[‘mykey1']
'apple'

>>> mydict.keys()
['mykey3', 'mykey2', ‘mykey1']

>>> type(mydict.keys())
<class ‘list'>
```

Logic: `if` Statements

If a condition is met, perform an action:

```
>>> name = "Katie"
>>> if name == "Katie":
        print("Hi Katie!")

Hi Katie!
```

Add a choice with the *else clause*:

```
>>> if name == "Katie":
        print("Hi Katie!")
    else:
        print("Impostor!")
```

`if` Statements

Add more choices with the *elif clause*:

```
>>> if name == "Katie":
        print("Hi Katie!")
    elif name == "Barbara":
        print("Hi Barbara!")
    else:
        person = input("Who are you? ")
        print('Hello', person)
```

`if` Statements: Practice

Write an if statement that prints the word “Yay!"
if the variable *mycolor* is "yellow".

Add an *elif clause* and an *else clause* to print
two different messages for other values of *mycolor*.

`if` Statements: Practice

Write an if statement that prints the word “Yay!" if the variable *mycolor* is "yellow".

Add an *elif clause* and an *else clause* to print two different messages for other values of *mycolor*.

```
>>> color = "blue"
>>> if color == "yellow":
        print("Yay!")
    elif color == "purple":
        print("Try again!")
    else:
        print("We want yellow!")
```

Loops

Loops are chunks of code
that repeat a task over and over again.

★*Counting* loops repeat a certain number of times.

★*Conditional* loops keep going until a certain thing happens (or as long as some condition is True).

Loops

Counting loops repeat a certain number of times - they keep going until they get to the end of a count.

```
>>> for mynum in [1, 2, 3, 4, 5]:
        print("Hello", mynum)

Hello 1
Hello 2
Hello 3
Hello 4
```

The *for* keyword is used to create this kind of loop, so it is usually just called a *for loop*.

Loops

Conditional loops repeat until something happens
(or as long as some condition is True).

```
>>> count = 0
>>> while (count < 4):
        print("The count is:", count)
        count = count + 1

The count is: 0
The count is: 1
```

The *while* keyword is used to create this kind of loop,
so it is usually just called a *while loop*.

Functions

Define a simple function:

```
>>> def say_hello():
        print("Hello")
```

Call the function:

```
>>> say_hello()
Hello
```

Define a function with arguments:

```
>>> def say_hello(myname):
        print("Hello", myname)
```

Call the function:

```
>>> say_hello("Katie")
Hello Katie

>>> say_hello("Barbara")
Hello Barbara
```

Functions: Practice

Create a function that takes **two numbers**, multiplies them together, and prints out the result.

Functions: Practice

Create a function that takes **two numbers**, multiplies them together, and prints out the result.

```
>>> def multiply(num1, num2):
        print(num1 * num2)

>>> multiply(4, 5)
20

>>> multiply("hello", 5)
hellohellohellohellohello
```

Functions: Output

```
>>> def dub(mynum):
        print(mynum*2)

>>> newnum = double(12)
24

>>> newnum
```

```
>>> def dub(mynum):
        return mynum*2

>>> newnum = double(12)

>>> newnum
24
```

Functions

- Functions are **defined** using **`def`**.
- Functions are **called** using **parentheses**.
- Functions take **arguments** and can return **outputs**.
- `print` *displays* information, but does not give a value
- `return` gives a **value** that can be reused

Modules

Lots of modules are included in the Python Standard Library.
Here's how you can use a few of these modules:

Generate a random number between 1-100:

```
>>> import random
>>> random.randint(1,100)
```

What timezone does your computer think it's in?:

```
>>> import time
>>> time.tzname
```

Print a calendar for this month!:

```
>>> import calendar
>>> calendar.prmonth(2016, 6)
```

Modules

Print the names of all the files in a directory:

```
>>> import os
>>> for file in os.listdir("/home/pi"):
        print(file)
```

Open a web page and read it:

```
>>> import urllib.request
>>> myurl = "http://www.google.com"
>>> data = urllib.request.urlopen(myurl).read()
>>> print(data)
```

Modules

Turtles!

```
>>> import turtle
>>> turtle.reset()
>>> turtle.forward(20)
>>> turtle.right(20)
>>> turtle.forward(20)
>>> turtle.bye()
```

You can find out about other modules at: http://docs.python.org

Objects

Objects

In the real world, objects have:

- things that you can do to them (actions)
- words that describe them (properties)

In Python:

- "things you can do" to an object are called *methods*
- "words that describe" an object are called *attributes*

Objects

If this ball is an *object* named myBall, it might have these *attributes*:

```
myBall.color
myBall.size
myBall.weight
```

You can display them:

```
print myBall.size
```

You can assign values to them:

```
myBall.color = 'green'
```

You can assign them to attributes in other objects:

```
anotherBall.color = myBall.color
```

Objects

The ball object might have these *methods*:

```
myBall.kick()
myBall.throw()
myBall.inflate()
```

Methods are the things you can *do* with an object.

Methods are chunks of code - *functions* - that are included inside the object.

Objects

In Python, a *class* is like a description - or blueprint - of an object.

```
class Ball:

  color = ‘red’
  size = ‘small’
  direction = ‘’

  def bounce(self):
    if self.direction == ‘down’:
      self.direction == ‘up’
```

Objects

Once we create an object by defining its class, we can call it in a program by creating an instance of it.

Creating multiple instances of an object:

```
>>> my_ball = Ball()
>>> your_ball = Ball()
>>> her_ball = Ball()
```

Giving these instances some attributes:

```
>>> my_ball.color = “purple”
>>> your_ball.color = “red”
>>> her_ball.color = “yellow”
```

Now let’s try out one of the methods:

```
>>> my_ball.bounce()
```

Let’s write some scripts

Script: Math Homework

homework.py

```
input_file = 'math_problems.txt'

def test_problems():
    f = open(input_file)
    lines = f.read().splitlines()
    f.close()
    for line in lines:
        answer = eval(line)
        print str(line) + " = " + str(answer)

def main():
    test_problems()

if __name__ == "__main__":
    main()
```

Script: Math Homework

```
input_file = 'math_problems.txt'

def test_problems():
    f = open(input_file)
    lines = f.read().splitlines()
    f.close()
    for line in lines:
        answer = eval(line)
        print str(line) + " = " + str(answer)

def main():
    test_problems()

if __name__ == "__main__":
    main()
```

Script: Urls

Ned's List of Programming Language URLs: http://memweb.newsguy.com/~nedbush/proglang.htm

urls.py

```
import urllib.request

input_file = 'urls.txt'
valid_output_file = 'valid_urls.txt'

def test_urls():
    f = open(input_file)
    lines = f.read().splitlines()
    f.close()

    v = open(valid_output_file, "w")

    for line in lines:
        try:
            urllib.request.urlopen(line)
            v.write(line)
        except urllib.error.URLError as error:
            print(line, error)
       except urllib.error.HTTPError as error:
            print(line, error.code)

    v.close

def main():
    ...
```

```
import urllib.request

input_file = 'urls.txt'
valid_output_file = 'valid_urls.txt'

def test_urls():

    f = open(input_file)
    lines = f.read().splitlines()
    f.close()

    v = open(valid_output_file, "w")

    for line in lines:
        try:
            urllib.request.urlopen(line)
            v.write(line)
        except urllib.error.URLError as error:
            print(line, error)
        except urllib.error.HTTPError as error:
            print(line, error.code)

    v.close

def main():
    ...
```

Script: web requests

weather.py

```
import json
import urllib.request
from pprint import pprint


def get_local_weather():

    weather_base_url = 'http://forecast.weather.gov/MapClick.php?FcstType=json&'

    places = {
        'Austin': ['30.3074624', '-98.0335911'],
        'Portland': ['45.542094', '-122.9346037'],
        'NYC': ['40.7053111', '-74.258188']
    }

    for place in places:
        latitude = places[place][0]
        longitude = places[place][1]

        weather_url = weather_base_url + "lat=" + latitude + "&lon=" + longitude

        page_response = urllib.request.urlopen(weather_url).read()
        weather_data = json.loads(page_response.decode('utf-8'))

        forecast = parse_weather_data(weather_data)

        print("Today's date is", forecast['date'],
            "and the current temperature in", place, forecast['state'],
            "is", forecast['temp'], "degrees")

def parse_weather_data(json_object):
    weather_obj = json_object

    todays_date = weather_obj['currentobservation']['Date']
    current_temp = weather_obj['currentobservation']['Temp']
    outlook = weather_obj['currentobservation']['Weather']
    state = weather_obj['currentobservation']['state']

    current_weather = {
        'date': todays_date,
        'temp': current_temp,
        'outlook': outlook,
        'state': state,
    }

    return current_weather


def main():
```

```
import json
import urllib.request
from pprint import pprint

def get_local_weather():
    weather_base_url = 'http://forecast.weather.gov/MapClick.php?FcstType=json&'

    places = {
        'Austin': ['30.3074624', '-98.0335911'],
        'Portland': ['45.542094', '-122.9346037'],
        'NYC': ['40.7053111', '-74.258188']
    }

    for place in places:
        latitude, longitude = places[place][0], places[place][1]
        weather_url = weather_base_url + "lat=" + latitude + "&lon=" + longitude

        page_response = urllib.request.urlopen(weather_url).read()
        weather_data = json.loads(page_response.decode('utf-8'))

        forecast = parse_weather_data(weather_data)
        print("Today's date is", forecast['date'],
            "and the current temperature in", place, forecast['state'],
            "is", forecast['temp'], "degrees")

def parse_weather_data(json_object):
    weather_obj = json_object

    todays_date = weather_obj['currentobservation']['Date']
    current_temp = weather_obj['currentobservation']['Temp']
    outlook = weather_obj['currentobservation']['Weather']
    state = weather_obj['currentobservation']['state']

    current_weather = {
        'date': todays_date,
        'temp': current_temp,
        'outlook': outlook,
        'state': state,
    }

    return current_weather
```

APIs

Some APIs you might look at later:

http://sunlightfoundation.com/

- lots of government data, state voting records, etc.

https://developers.google.com/maps/documentation/static-maps/

- create custom maps based on url parameters

https://developers.google.com/apis-explorer/#p/

- all of Google's other APIs

https://www.flickr.com/services/api/

https://dev.twitter.com/

What can you do with scripting?

- Math homework
- Ping urls
- Get the latest weather
-

What are some other ideas?

For later:

Hopefully, you said something like “Hello” and Brobot said something that sounded like a greeting in reply. For the “greet the robot” use case, we can use simple keyword matching, similar to how ELIZA and other early conversational UIs were modeled. Here’s the relevant code:

```
# Sentences we'll respond with if the user greeted us
GREETING_KEYWORDS = ("hello", "hi", "greetings", "sup", "what's up",)

GREETING_RESPONSES = ["'sup bro", "hey", "*nods*", "hey you get my snap?"]

def check_for_greeting(sentence):
    """If any of the words in the user's input was a greeting, return a greeting response"""
    for word in sentence.words:
        if word.lower() in GREETING_KEYWORDS:
            return random.choice(GREETING_RESPONSES)
```

This is the simplest possible implementation of a chatbot: it searches the user’s utterance for one or more known keywords and returns one of several possible responses. In practice you won’t want your bot to pick a truly random response—it’s better to cycle through a set of responses and avoid repeats. To keep the tutorial simple I’ve made Brobot completely stateless, so pure randomness will have to do.

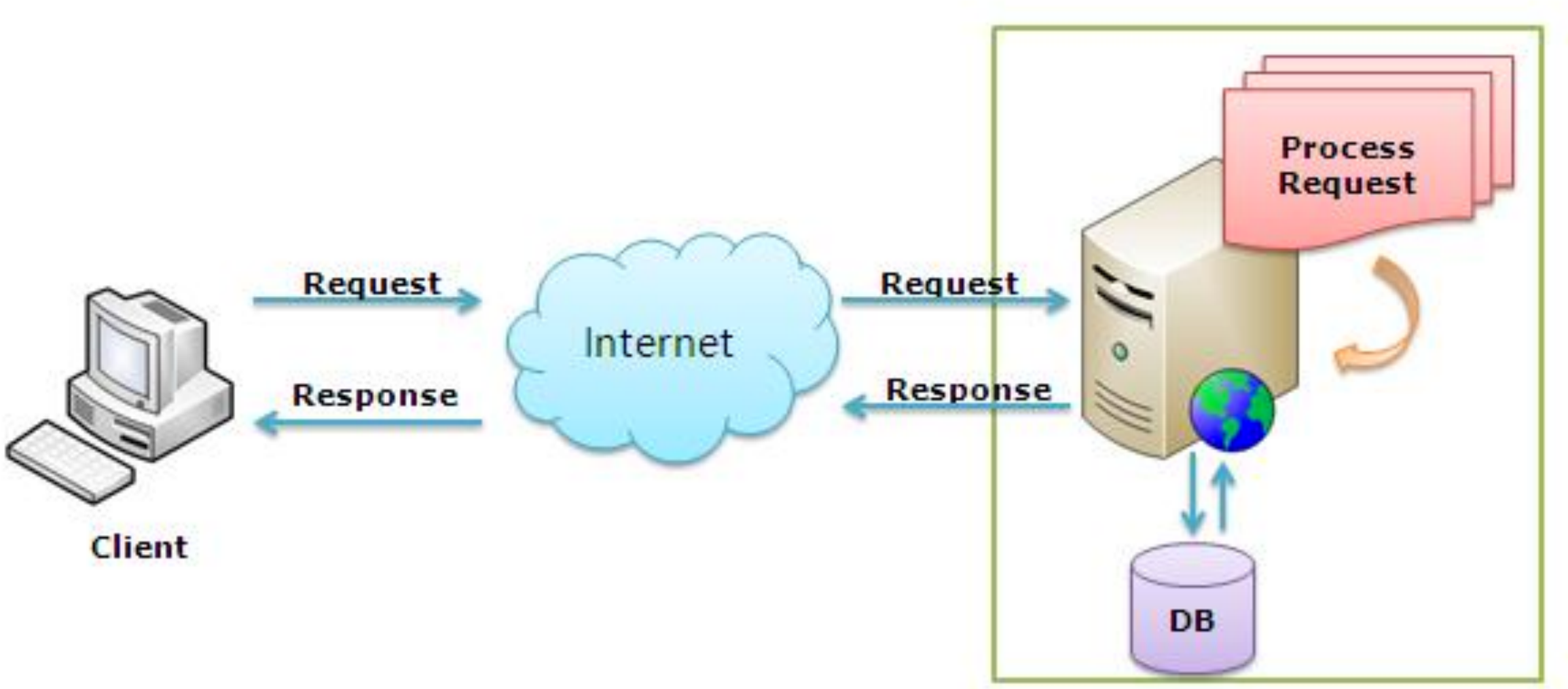
Go ahead and modify the code above, right in the browser, to change Brobot’s behavior. Try returning only one response, or responding to more greetings. (If your code has an error, Brobot will pass along the Python message.)

YOU: Run code

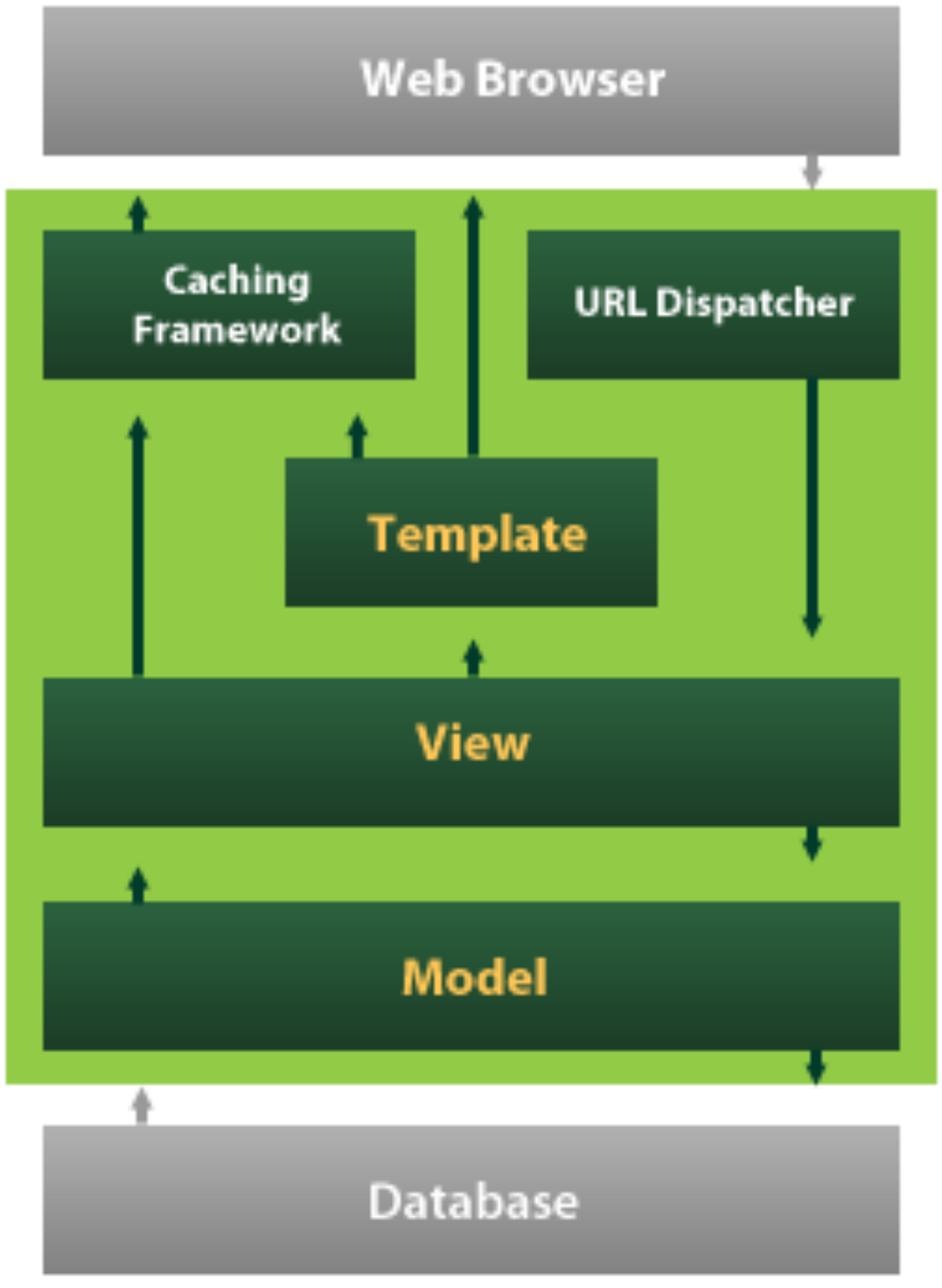
https://apps.worldwritable.com/tutorials/chatbot/

Let's build a web site

How the internet works



Frameworks


Web Browser
Caching Framework
URL Dispatcher
Template
View
Model
Database

Frameworks

https://www.djangoproject.com/
https://code.djangoproject.com/

http://www.web2py.com/

http://flask.pocoo.org/

Frameworks

- Source code (Python)

  - what the web site should do

- Templates (HTML)

  - how the web site should look

Resources:

https://www.codecademy.com/en/tracks/htmlcss

http://www.w3schools.com/default.asp

pythonanywhere.com

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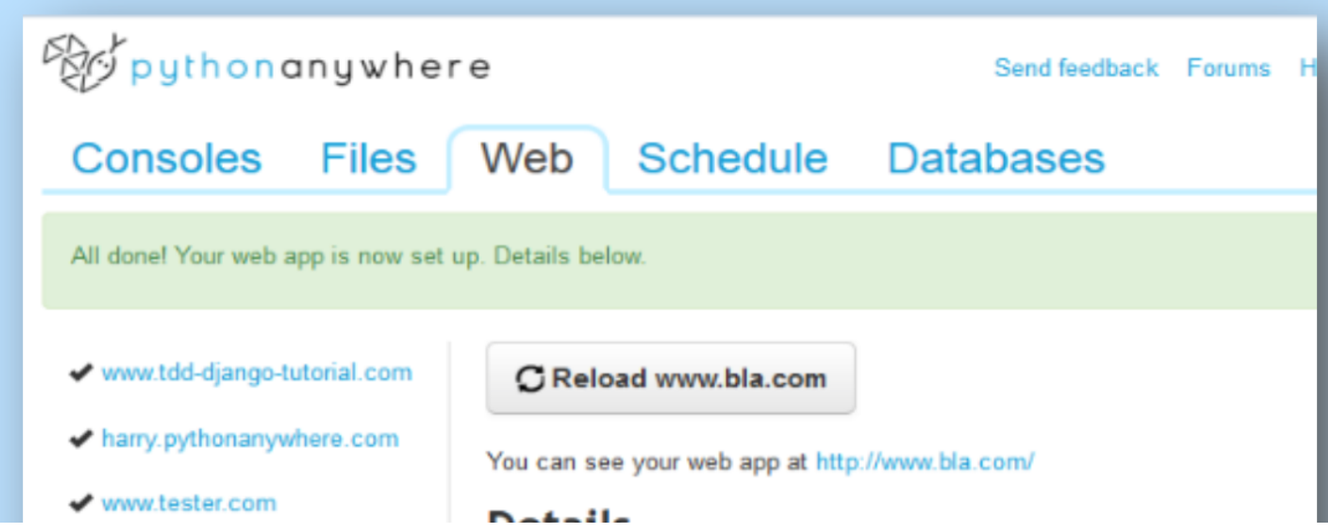

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Email:

Password:

Password (again):

I agree to the Terms and Conditions

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We promise not to spam or pass your details on to anyone else.

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Unconfirmed email address

Consoles Files Web Schedule Databases

Thank you!

You're now signed up and logged in to your PythonAnywhere account: **barbaras**.

We've sent an email to **bshaurette@outlook.com**. If you click the link in the email to confirm your email address, we'll be able to reset your password if you forget it in the future.

What next?

We've got some helpers to get you started with some common tasks — why not try one out? Alternatively, if you don't want any help, just click the "X" button above and to the right.

- I want to start learning Python
- I want to follow the Django Tutorial
- I want to create a web application
- I have built a web app on my local PC and want to deploy it on PythonAnywhere
- I want to clone and hack on my GitHub project
- I want to check out the PythonAnywhere Education features

If there's something else you think we should have here, click here to let us know.
You can access these task helpers again at any time from the *Help* page

Start a new console:

Python: 3.4 / 3.3 / 2.7 / 2.6 IPython: 3.4 / 3.3 / 2.7 / 2.6 PyPy: 2.7
Other: Bash | MySQL
Custom:

0% used *(0.00s of your 100 second CPU allowance)*
Allowance resets in 23 hours, 59 minutes

Your consoles:

You have no consoles. Click a link above to start one.

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Consoles Files Web Schedule Databases

Add a new web app

You have no web apps

To create a PythonAnywhere-hosted web app, click the "Add a new web app" button to the left.

Create new web app

Your web app's domain name

Your account doesn't support custom domain names, so your PythonAnywhere web app will live at `flasksimpletutorial.pythonanywhere.com`.

Want to change that? Upgrade now!

Otherwise, just click "Next" to continue.

Cancel

« Back

Next »

Create new web app

Select a Python Web framework

...or select "Manual configuration" if you want detailed control.

- » **Django**
- » **web2py**
- » **Flask**
- » **Bottle**
- » **Manual configuration** (including virtualenvs)

What other frameworks should we have here? Send us some feedback using the link at the top of the page!

Cancel

« Back Next »

Create new web app

Select a Python version

- » **Python 3.4** (Flask 0.10.1)
- » **Python 3.3** (Flask 0.10.1)
- » **Python 2.7** (Flask 0.9)

Note: If you'd like to use a different version of Flask to the default version, you can use a virtualenv for your web app. There are instructions here.

Cancel

« Back

Next »

Create new web app

Quickstart new Flask project

Enter a path for a Python file you wish to use to hold your Flask app.
If this file already exists, its contents will be overwritten with the new app.

Path

/home/flasksimpletutorial/mysite/flasl

Cancel

« Back Next »

All done! Your web app is now set up. Details below.

✔ flasksimpletutorial.pythonanywhere.com

Add a new web app

Configuration for flasksimpletutorial.pythonanywhere.com

Reload:

Reload flasksimpletutorial.pythonanywhere.com

Traffic:

How busy is your site?

This month (previous month)	0	(0)
Today (yesterday)	0	(0)
Hour (previous hour)	0	(0)

Want some more data? Paying accounts get pretty charts ;-)

Code:

What your site is running.

Source code:	/home/flasksimpletutorial/mysite
WSGI configuration file:	/var/www/flasksimpletutorial_pythonanywhere_com_wsgi.py
Python version:	3.4

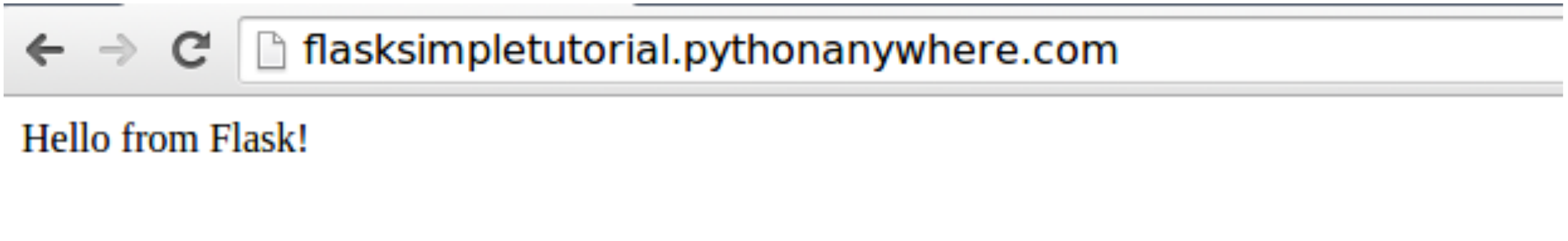
Virtualenv:

Use a virtualenv to get different versions of flask, django etc from our default system ones. More info here. You need to **Reload your web app** to activate it; NB - will do nothing if the virtualenv does not exist.

Enter path to a virtualenv, if desired

Log files:

The first place to look if something goes wrong.


flasksimpletutorial.pythonanywhere.com
Hello from Flask!

Today (yesterday)	1	(0)
Hour (previous hour)	1	(0)

Want some more data? Paying accounts get pretty charts ;-)

Code:

What your site is running.

Source code:	/home/barbaras/mysite
WSGI configuration file:	/var/www/barbaras_pythonanywhere_com_wsgi.py
Python version:	3.4

Virtualenv:

Use a virtualenv to get different versions of flask, django etc from our default system ones. More info here. You need to **Reload your web app** to activate it; NB - will do nothing if the virtualenv does not exist.

Enter path to a virtualenv, if desired

Log files:

The first place to look if something goes wrong.

Access log:	barbaras.pythonanywhere.com.access.log
Error log:	barbaras.pythonanywhere.com.error.log
Server log:	barbaras.pythonanywhere.com.server.log

Static files:

Files that aren't dynamically generated by your code, like CSS, JavaScript or uploaded files, can be served much faster straight off the disk if you specify them here. You need to **Reload your web app** to activate any changes you make to the mappings below.

URL	Directory	Delete
Enter URL	*Enter path*	

pythonanywhere.com

mysite : /home/barbaras/mysite : Directory Listing : barbaras : PythonAnywhere | barbaras.pythonanywhere.com

pythonanywhere

Send feedback Forums Help Blog Dashboard Account Log out

Consoles Files Web Schedule Databases

/ > home > barbaras > mysite

Open Bash console here

Enter new directory name New

Enter new file name New

__pycache__/

Upload a file: Choose File no file selected

flask_app.py 2016-03-26 15:38 186 bytes

0% full *(64.0 KB of your 512.0 MB quota)*

pythonanywhere.com

flask_app.py : /home/barbaras/mysite/flask_app.py : Editor : barbaras : PythonAnywhere | barbaras.pythonanywhere.com

pythonanywhere

Send feedback Forums Help Blog Dashboard Account Log out

/ > home > barbaras > mysite > flask_app.py

Keyboard shortcuts: Normal Save Save as... >>>

```
1
2  # A very simple Flask Hello World app for you to get started with...
3
4  from flask import Flask
5
6  app = Flask(__name__)
7
8  @app.route('/')
9  def hello_world():
10     return 'Hello from Flask!'
11
12
```

>>> Run this file

pythonanywhere.com

flask_app.py : /home/barbaras/mysite/flask_app.py : Editor : barbaras : PythonAnywhere | barbaras.pythonanywhere.com

pythonanywhere

Send feedback Forums Help Blog Dashboard Account Log out

/ > home > barbaras > mysite > flask_app.py

Keyboard shortcuts: Normal Save Save as... >>>

```
1
2  # A very simple Flask Hello World app for you to get started with...
3
4  from flask import Flask
5
6  app = Flask(__name__)
7
8  @app.route('/')
9  def hello_world():
10     r = "Hello from Barbara!"
11     return r
```

>>> Run this file

barbaras.pythonanywhere.com

flask_app.py : /home/barbaras/mysite/flask_app.py : Editor : barbaras : PythonAnywhere

barbaras.pythonanywhere.com

Hello from Barbara!

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Consoles | Files | Web | Schedule | Databases

/ > home > barbaras > mysite

Open Bash console here

Enter new directory name | New

Enter new file name | New

__pycache__/

templates/

Upload a file: Browse… No file selected.

flask_app.py 2016-05-04 18:43 1.1 KB

0% full *(72.0 KB of your 512.0 MB quota)*

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Consoles | Files | Web | Schedule | Databases

/ > home > barbaras > mysite > templates

Open Bash console here

Enter new directory name | New

Enter new file name | New

Upload a file: Choose File no file selected

main_page.html 2016-03-28 16:03 0 bytes

0% full *(72.0 KB of your 512.0 MB quota)*

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Send feedback Forums Help Blog Dashboard Account Log out

/ > home > barbaras > mysite > templates > main_page.html

Keyboard shortcuts: Normal Save Save as...

1

```
<html>
<head>
<title>My comments page</title>
</head>

<body>

<div>This is the first placeholder comment.</div>
<div>This is the second placeholder comment. It's no more interesting than the
first.</div>
<div>This is the third placeholder comment. It's actually quite exciting!</div>

<div>
<form action="." method="POST">
<textarea name="contents" placeholder="Enter a comment"></textarea>
<input type="submit" value="Post comment">
</form>
</div>

</body>
</html>
```

```
1  <html>
2  <head>
3  <title>My comments page</title>
4  </head>
5
6  <body>
7
8  <div>This is the first placeholder comment.</div>
9  <div>This is the the second placeholder comment. It's no more interesting than the first.</div>
10 <div>This is the third placeholder comment. It's actually quite exciting!</div>
11
12 <div>
13 <form action="." method="POST">
14 <textarea name="contents" placeholder="Enter a comment"></textarea>
15 <input type="submit" value="Post comment">
16 </form>
17 </div>
18
19 </body>
20 </html>
```

pythonanywhere.com

main_page.html : /home/barbaras/mysite/templates/main... | flask_app.py : /home/barbaras/mysite/flask_app.py : E... | barbaras.pythonanywhere.com

pythonanywhere

Send feedback Forums Help Blog Dashboard Account Log out

/ > home > barbaras > mysite > flask_app.py

Keyboard shortcuts: Normal Save Save as... >>>

```
1  from flask import Flask, render_template
2
3  app = Flask(__name__)
4  app.config["DEBUG"] = True
5
6  @app.route('/')
7  def index():
8      return render_template("main_page.html")
9
```

>>> Run this file

pythonanywhere.com

pythonanywhere

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Consoles Files Web Schedule Databases

barbaras.pythonanywhere.com

Add a new web app

Configuration for barbaras.pythonanywhere.com

Reload:

Reload
barbaras.pythonanywhere.com

Best before date:

Free sites have a limited lifespan, but you can renew that here up to a maximum of three months from today's date. You can always extend it later too! We'll send you an email a week before it expires. See here for more details.

barbaras.pythonanywhere.com

main_page.html : /home/barbaras/mysite/templates/main...

flask_app.py : /home/barbaras/mysite/flask_app.

This is the first placeholder comment.
This is the the second placeholder comment. It's no more interesting than the first.
This is the third placeholder comment. It's actually quite exciting!

Enter a comment

Post comment

pythonanywhere.com

main_page.html : /home/barbaras/mysite/templates/main... | flask_app.py : /home/barbaras/mysite/flask_app.py : E... | My comments page

pythonanywhere

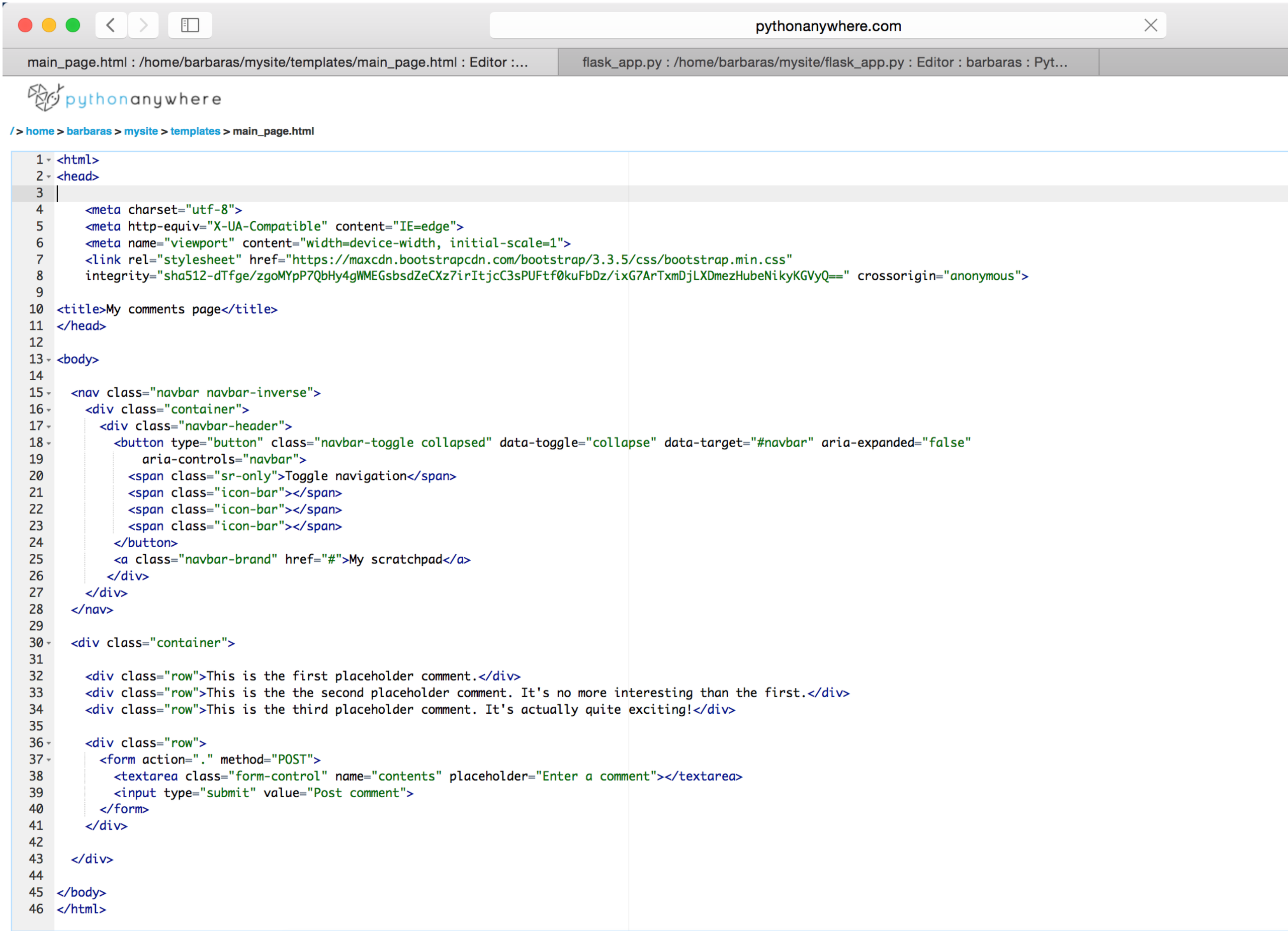
Send feedback Forums Help Blog Dashboard Account Log out

/ > home > barbaras > mysite > templates > main_page.html

Keyboard shortcuts: Normal Save Save as...

```
1  <html>
2  <head>
3  <title>My comments page</title>
4  </head>
5
6  <body>
7
8  <div>This is the first placeholder comment.</div>
9  <div>This is the the second placeholder comment. It's no more interesting than the first.</div>
10 <div>This is the third placeholder comment. It's actually quite exciting!</div>
11
12 <div>
13 <form action="." method="POST">
14 <textarea name="contents" placeholder="Enter a comment"></textarea>
15 <input type="submit" value="Post comment">
16 </form>
17 </div>
18
19 </body>
20 </html>
```

```
<html>
<head>

    <meta charset="utf-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1">
    <link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.5/css/bootstrap.min.css"
    integrity="sha512-dTfge/zgoMYpP7QbHy4gWMEGsbsdZeCXz7irItjcC3sPUFtf0kuFbDz/ixG7ArTxmDjLXDmezHubeNikyKGVyQ=="
crossorigin="anonymous">

<title>My comments page</title>
</head>

<body>

  <nav class="navbar navbar-inverse">
    <div class="container">
      <div class="navbar-header">
        <button type="button" class="navbar-toggle collapsed" data-toggle="collapse" data-target="#navbar" aria-expanded="false"
            aria-controls="navbar">
          <span class="sr-only">Toggle navigation</span>
          <span class="icon-bar"></span>
          <span class="icon-bar"></span>
          <span class="icon-bar"></span>
        </button>
        <a class="navbar-brand" href="#">My scratchpad</a>
       </div>
    </div>
  </nav>

  <div class="container">

    <div>This is the first placeholder comment.</div>
    <div>This is the second placeholder comment. It's no more interesting than the first.</div>
    <div>This is the third placeholder comment. It's actually quite exciting!</div>

    <div class="row">
      <form action="." method="POST">
        <textarea class="form-control" name="contents" placeholder="Enter a comment"></textarea>
        <input type="submit" value="Post comment">
      </form>
    </div>

  </div>

</body>
</html>
```


pythonanywhere.com
main_page.html : /home/barbaras/mysite/templates/main_page.html : Editor :...
flask_app.py : /home/barbaras/mysite/flask_app.py : Editor : barbaras : Pyt...
pythonanywhere
/ > home > barbaras > mysite > templates > main_page.html
1 <html>
2 <head>
3
4 <meta charset="utf-8">
5 <meta http-equiv="X-UA-Compatible" content="IE=edge">
6 <meta name="viewport" content="width=device-width, initial-scale=1">
7 <link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.5/css/bootstrap.min.css"
8 integrity="sha512-dTfge/zgoMYpP7QbHy4gWMEGsbsdZeCXz7irItjcC3sPUFtf0kuFbDz/ixG7ArTxmDjLXDmezHubeNikyKGVyQ==" crossorigin="anonymous">
9
10 <title>My comments page</title>
11 </head>
12
13 <body>
14
15 <nav class="navbar navbar-inverse">
16
17
18 <button type="button" class="navbar-toggle collapsed" data-toggle="collapse" data-target="#navbar" aria-expanded="false"
19 aria-controls="navbar">
20 Toggle navigation
21
22
23
24 </button>
25 My scratchpad
26
27
28 </nav>
29
30
31
32 This is the first placeholder comment.
33 This is the the second placeholder comment. It's no more interesting than the first.
34 This is the third placeholder comment. It's actually quite exciting!
35
36
37 <form action="." method="POST">
38 <textarea class="form-control" name="contents" placeholder="Enter a comment"></textarea>
39 <input type="submit" value="Post comment">
40 </form>
41
42
43
44
45 </body>
46 </html>
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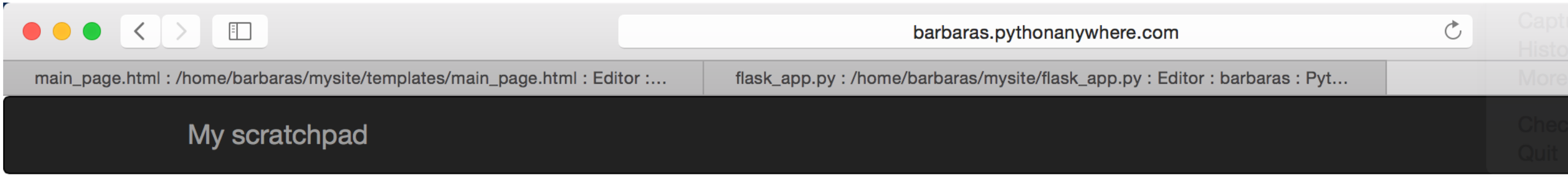
barbaras.pythonanywhere.com
main_page.html : /home/barbaras/mysite/templates/main_page.html : Editor :...
flask_app.py : /home/barbaras/mysite/flask_app.py : Editor : barbaras : Pyt...
My scratchpad
This is the first placeholder comment.
This is the the second placeholder comment. It's no more interesting than the first.
This is the third placeholder comment. It's actually quite exciting!
Enter a comment
Post comment

Sending and receiving data

Method Not Allowed

The method is not allowed for the requested URL.

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main_page.html : /home/barbaras/mysite/templates/main_page.html : Editor :... | flask_app.py : /home/barbaras/mysite/flask_app.py : Editor : barbaras

pythonanywhere

/ > home > barbaras > mysite > flask_app.py

```
1  from flask import Flask, render_template
2
3  app = Flask(__name__)
4  app.config["DEBUG"] = True
5
6  @app.route('/', methods=["GET", "POST"])
7  def index():
8      return render_template("main_page.html")
9
```

barbaras.pythonanywhere.com

main_page.html : /home/barbaras/mysite/templates/main_page.html : Editor :...

flask_app.py : /home/barbaras/mysite/flask_app.py : Editor : barbaras : Pyt...

My scratchpad

This is the first placeholder comment.

This is the the second placeholder comment. It's no more interesting than the first.

This is the third placeholder comment. It's actually quite exciting!

Enter a comment

Post comment

pythonanywhere.com

main_page.html : /home/barbaras/mysite/templates/main_page.html : Editor :...

*flask_app.py : /home/barbaras/mysite/flask_app.py : Editor : barbaras : Py...

pythonanywhere

Se

/ > home > barbaras > mysite > flask_app.py *

Key

```
1  from flask import Flask, redirect, render_template, request, url_for
2
3  app = Flask(__name__)
4  app.config["DEBUG"] = True
5
6  comments = []
7
8  @app.route('/', methods=["GET", "POST"])
9  def index():
10     if request.method == "GET":
11         return render_template("main_page.html", comments=comments)
12
13     comments.append(request.form["contents"])
14     return redirect(url_for('index'))
```

```
from flask import Flask, redirect, render_template, request, url_for

app = Flask(__name__)
app.config["DEBUG"] = True

comments = []

@app.route('/', methods=["GET", "POST"])
def index():
    if request.method == "GET":
        return render_template("main_page.html", comments=comments)

    comments.append(request.form["contents"])
    return redirect(url_for('index'))
```

barbaras.pythonanywhere.com

main_page.html : /home/barbaras/mysite/templates/main_page.html : Editor :...

flask_app.py : /home/barbaras/mysite/flask_app.py : Editor : barbaras : Pyt...

My scratchpad

This is the first placeholder comment.

This is the the second placeholder comment. It's no more interesting than the first.

This is the third placeholder comment. It's actually quite exciting!

Enter a comment

Post comment

pythonanywhere.com

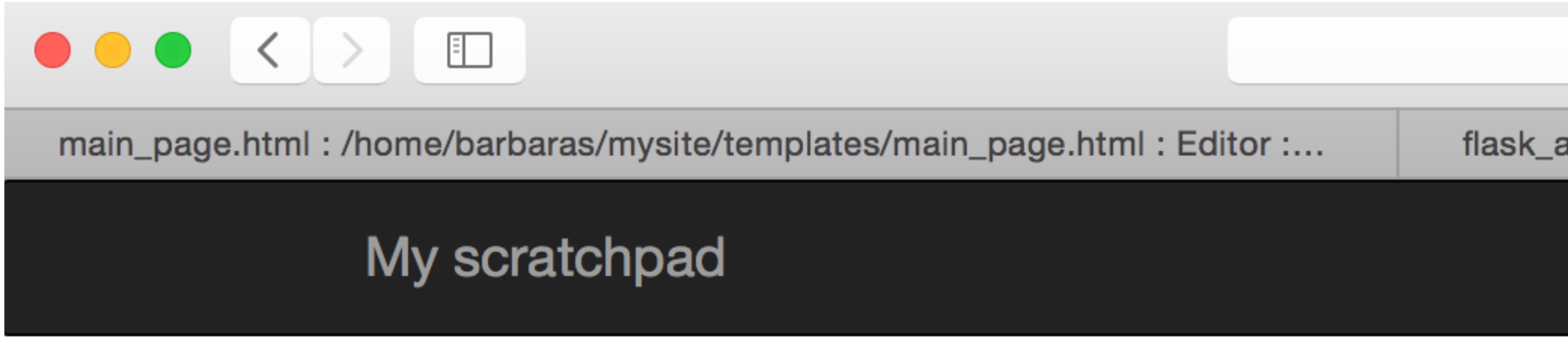
main_page.html : /home/barbaras/mysite/templates/main_page.html : Editor :... | *flask_app.py : /home/barbaras/mysite/flask_app.py : Editor : bar

pythonanywhere

/ > home > barbaras > mysite > templates > main_page.html

```
 9
10  <title>My comments page</title>
11  </head>
12
13  <body>
14
15    <nav class="navbar navbar-inverse">
16      <div class="container">
17        <div class="navbar-header">
18          <button type="button" class="navbar-toggle collapsed" data-toggle="collapse" data-target="#navbar" a
19              aria-controls="navbar">
20            <span class="sr-only">Toggle navigation</span>
21            <span class="icon-bar"></span>
22            <span class="icon-bar"></span>
23            <span class="icon-bar"></span>
24          </button>
25          <a class="navbar-brand" href="#">My scratchpad</a>
26        </div>
27      </div>
28    </nav>
29
30    <div class="container">
31
32      {% for comment in comments %}
33        <div class="row">
34          {{ comment }}
35        </div>
36      {% endfor %}
37
38      <div class="row">
```

```
<html>
<head>

    <meta charset="utf-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1">
    <link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.5/css/bootstrap.min.css"
    integrity="sha512-dTfge/zgoMYpP7QbHy4gWMEGsbsdZeCXz7irItjcC3sPUFtf0kuFbDz/ixG7ArTxmDjLXDmezHubeNikyKGVyQ==" crossorigin="anonymous">

<title>My comments page</title>
</head>

<body>

  <nav class="navbar navbar-inverse">
    <div class="container">
      <div class="navbar-header">
        <button type="button" class="navbar-toggle collapsed" data-toggle="collapse" data-target="#navbar" aria-expanded="false"
            aria-controls="navbar">
          <span class="sr-only">Toggle navigation</span>
          <span class="icon-bar"></span>
          <span class="icon-bar"></span>
          <span class="icon-bar"></span>
        </button>
        <a class="navbar-brand" href="#">My scratchpad</a>
       </div>
    </div>
  </nav>

  <div class="container">

    {% for comment in comments %}
      <div class="row">
        {{ comment }}
      </div>
    {% endfor %}

    <div class="row">
      <form action="." method="POST">
        <textarea class="form-control" name="contents" placeholder="Enter a comment"></textarea>
        <input type="submit" value="Post comment">
      </form>
    </div>

  </div>

</body>
</html>
```



This is a whole new comment!

This is another new comment!

Enter a comment

Post comment

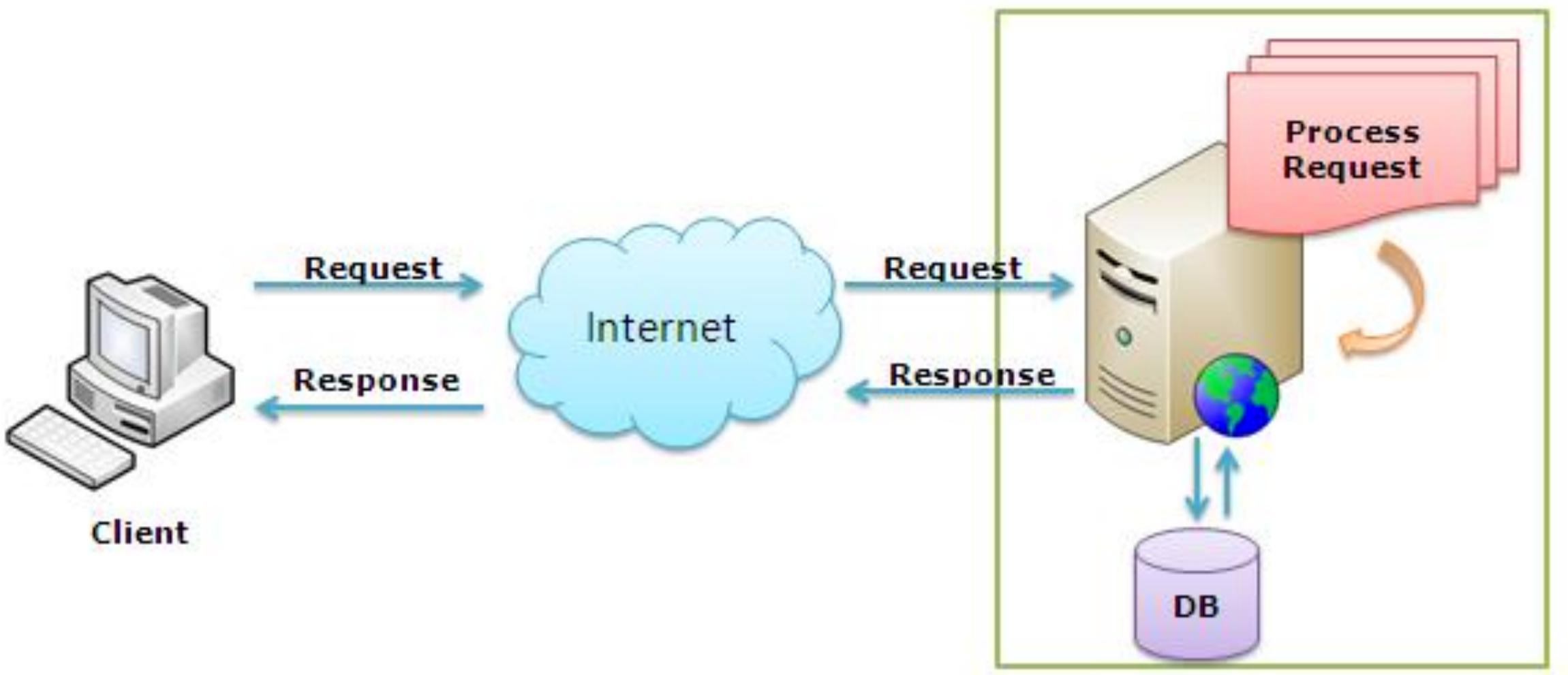
Bring on the database!

What is a database?

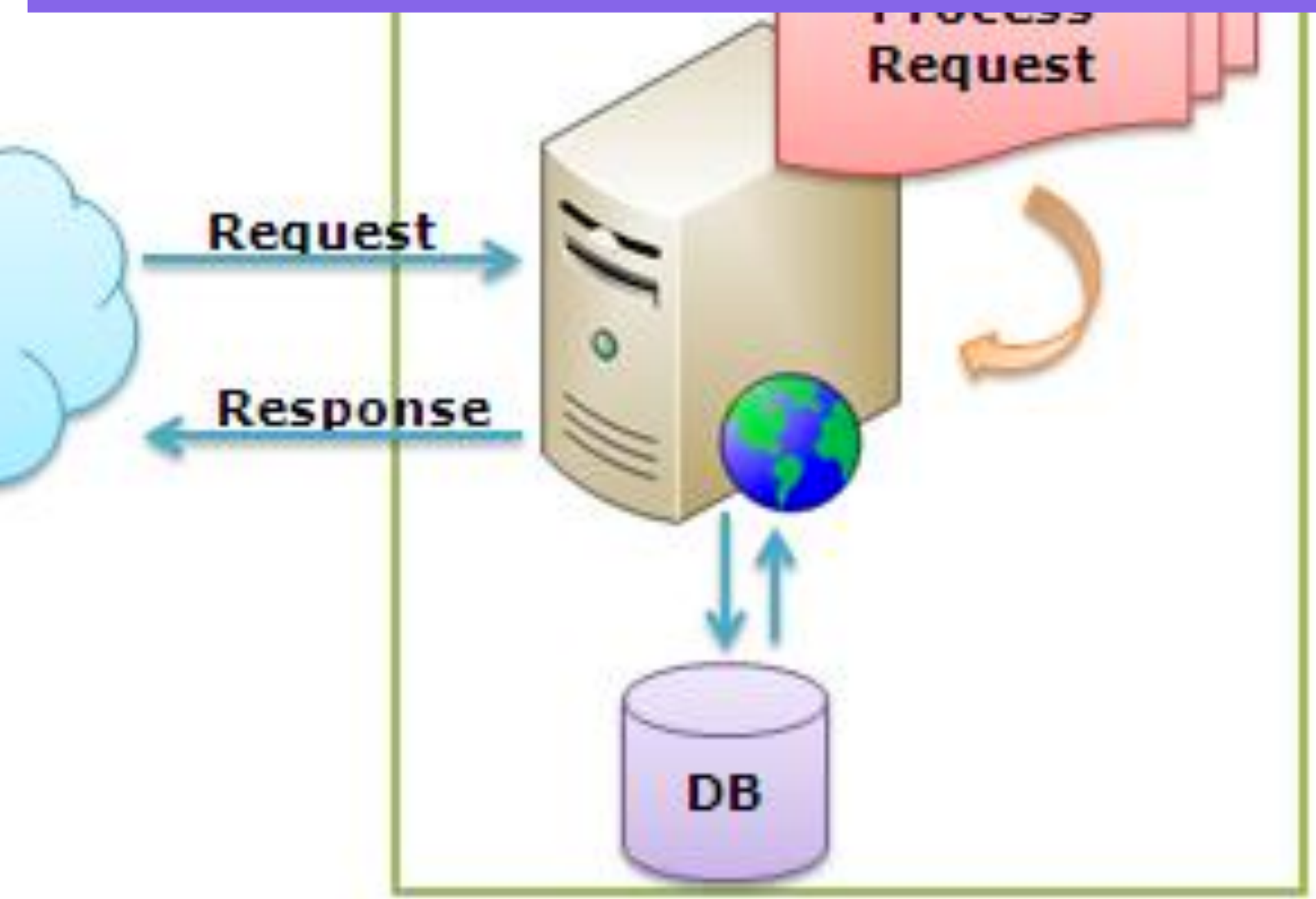
A program that stores data.

- Files
- Tables
- Text records
- Images
- Other kinds of objects

Bring on the database!



Bring on the database!



MySQL settings

Connecting:

Use these settings in your web applications.

Database host address: `barbaras.mysql.pythonanywhere-services.com`

Username: `barbaras`

Your databases:

You don't have any databases yet. To start using MySQL, enter a new password in the form below, and note it down: you'll need it to access the databases once you've created them.

MySQL password:

This should be different to your main PythonAnywhere password, because it is likely to appear in plain text in any web applications you write.

New password:

Confirm password:

Set MySQL password

Your MySQL password has been changed.

MySQL settings

Connecting:

Use these settings in your web applications.

Database host address: `flasksimpletutorial.mysql.pythonanywhere-services.com`

Username: `flasksimpletutor`

Your databases:

Click a database's name to start a MySQL console logged in to it.

Start a console on: `flasksimpletutor$default`

Create a database

Your database names always start with your username + "$". There's no need to type that prefix in below, though: PythonAnywhere will automatically add it.

Database name: Enter new database name

Create

MySQL password:

This should be different to your main PythonAnywhere password, because it is likely to appear in plain text in any web applications you write.

New password:

Confirm password:

Set MySQL password

Create a database

Your database names always start with your username + "$". There's no need to type that prefix in below, though: PythonAnywhere will automatically add it.

Database name: comments

Create

Your databases:

Click a database's name to start a MySQL console logged in to it.

Start a console on: `flasksimpletutor$comments`

Start a console on: `flasksimpletutor$default`

```
1  from flask import Flask, redirect, render_template, request, url_for
2  from flask.ext.sqlalchemy import SQLAlchemy
3
4  app = Flask(__name__)
5  app.config["DEBUG"] = True
6
7  SQLALCHEMY_DATABASE_URI = "mysql+mysqlconnector://{username}:{password}@{hostname}/{databasename}".format(
8      username="<the username from the 'Databases' tab>",
9      password="<the password you set on the 'Databases' tab>",
10     hostname="<the database host address from the 'Databases' tab>",
11     databasename="<the database name you chose, probably yourusername$comments>",
12 )
13 app.config["SQLALCHEMY_DATABASE_URI"] = SQLALCHEMY_DATABASE_URI
14 app.config["SQLALCHEMY_POOL_RECYCLE"] = 299
15
16 db = SQLAlchemy(app)
17
18 comments = []
19
20 @app.route('/', methods=["GET", "POST"])
21 def index():
22     if request.method == "GET":
23         return render_template("main_page.html", comments=comments)
24
25     comments.append(request.form["contents"])
26     return redirect(url_for('index'))
```

MySQL settings

Connecting:

Use these settings in your web applications.

Database host address: `barbaras.mysql.pythonanywhere-services.com`

Username: `barbaras`

Your databases:

Click a database's name to start a MySQL console logged in to it.

Start a console on: `barbaras$default`

Start a console on: `barbaras$myflasksample`

```
from flask import Flask, redirect, render_template, request, url_for
from flask.ext.sqlalchemy import SQLAlchemy

app = Flask(__name__)
app.config["DEBUG"] = True

SQLALCHEMY_DATABASE_URI = "mysql+mysqlconnector://{username}:{password}@{hostname}/
{databasename}".format(
    username="barbaras",
    password="???",
    hostname="barbaras.mysql.pythonanywhere-services.com",
    databasename="barbaras$myflasksample",
)
app.config["SQLALCHEMY_DATABASE_URI"] = SQLALCHEMY_DATABASE_URI
app.config["SQLALCHEMY_POOL_RECYCLE"] = 299

db = SQLAlchemy(app)

comments = []

@app.route('/', methods=["GET", "POST"])
def index():
    if request.method == "GET":
        return render_template("main_page.html", comments=comments)

    comments.append(request.form["contents"])
    return redirect(url_for('index'))
```

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Send feedback Forums Help Blog Dashboard Account Log out

Consoles Files Web Schedule Databases

All done! Your web app is now set up. Details below.

✔ flasksimpletutorial.pythonanywhere.com

Add a new web app

Configuration for flasksimpletutorial.pythonanywhere.com

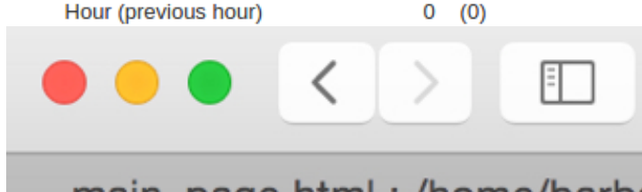
Reload:

Reload flasksimpletutorial.pythonanywhere.com

Traffic:

How busy is your site?

This month (previous month)	0	(0)
Today (yesterday)	0	(0)
Hour (previous hour)	0	(0)



main_page.html : /home/barbaras/mysite/templates/main_page.html : Editor :…

flask_app.py :

My scratchpad

Enter a comment

Post comment

```
1  from flask import Flask, redirect, render_template, request, url_for
2  from flask.ext.sqlalchemy import SQLAlchemy
3
4  app = Flask(__name__)
5  app.config["DEBUG"] = True
6
7  SQLALCHEMY_DATABASE_URI = "mysql+mysqlconnector://{username}:{password}@{hostname}/{databasename}".format(
8      username="<the username from the 'Databases' tab>",
9      password="<the password you set on the 'Databases' tab>",
10     hostname="<the database host address from the 'Databases' tab>",
11     databasename="<the database name you chose, probably yourusername$comments>",
12 )
13 app.config["SQLALCHEMY_DATABASE_URI"] = SQLALCHEMY_DATABASE_URI
14 app.config["SQLALCHEMY_POOL_RECYCLE"] = 299
15
16 db = SQLAlchemy(app)
17
18 class Comment(db.Model):
19
20     __tablename__ = "comments"
21
22     id = db.Column(db.Integer, primary_key=True)
23     content = db.Column(db.String(4096))
24
25 comments = []
26
```

Untitled spreadsheet

File Edit View Insert Format Data Tools Add-ons Help All changes saved in Drive

$ % .0 .00 123 Arial 10 B I S A

fx id

	A	B	C	D	E
1	**id**	**content**			
2	1	This is the first placeholder comment.			
3	2	This is the second placeholder comment. It's no more interesting than the first.			
4	3	This is the third placeholder comment. It's actually quite exciting!			
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					

comments

```
from flask import Flask, redirect, render_template, request, url_for
from flask.ext.sqlalchemy import SQLAlchemy

app = Flask(__name__)
app.config["DEBUG"] = True

SQLALCHEMY_DATABASE_URI = "mysql+mysqlconnector://{username}:{password}@{hostname}/
{databasename}".format(
    username="barbaras",
    password="???",
    hostname="barbaras.mysql.pythonanywhere-services.com",
    databasename="barbaras$myflasksample",
)
app.config["SQLALCHEMY_DATABASE_URI"] = SQLALCHEMY_DATABASE_URI
app.config["SQLALCHEMY_POOL_RECYCLE"] = 299

db = SQLAlchemy(app)

class Comment(db.Model):
    __tablename__ = "comments"
    id = db.Column(db.Integer, primary_key=True)
    content = db.Column(db.String(4096))

comments = []

@app.route('/', methods=["GET", "POST"])
def index():
    if request.method == "GET":
        return render_template("main_page.html", comments=comments)

    comments.append(request.form["contents"])
    return redirect(url_for('index'))
```

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main_page.html : /home/barb… | flask_app.py : /home/barbaras… | Database Settings: PythonAn… | mysite : /home/barbaras/my… | My comments page

pythonanywhere

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Consoles Files Web Schedule Databases

/ > home > barbaras > mysite

Open Bash console here

Enter new directory name New

Enter new file name New

__pycache__/

templates/

Upload a file: Choose File no file selected

flask_app.py 2016-03-28 18:36 1.0 KB

0% full *(176.0 KB of your 512.0 MB quota)*

pythonanywhere.com

main_page.html : /home/barb... | flask_app.py : /home/barbaras... | Database Settings: PythonAn... | Bash console 2588467 : bar... | My comments page

pythonanywhere

Bash console 2588467

Share with others

```
18:47 ~/mysite $ ipython3.4
Python 3.4.3 (default, Oct 14 2015, 20:28:29)
Type "copyright", "credits" or "license" for more information.

IPython 4.1.2 -- An enhanced Interactive Python.
?         -> Introduction and overview of IPython's features.
%quickref -> Quick reference.
help      -> Python's own help system.
object?   -> Details about 'object', use 'object??' for extra details.

In [1]: from flask_app import db

In [2]: db.create_all()

In [3]:
```

Your databases:

Click a database's name to start a MySQL console logged in to it.

Start a console on: `barbaras$default`

Start a console on: `barbaras$myflasksample`

MySQL: barbaras$myflasksample

Share with others

```
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 19428
Server version: 5.5.42-log Source distribution

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> show tables;
+---------------------------------+
| Tables_in_barbaras$myflasksample |
+---------------------------------+
| comments                        |
+---------------------------------+
1 row in set (0.00 sec)

mysql> describe comments;
+---------+--------------+------+-----+---------+----------------+
| Field   | Type         | Null | Key | Default | Extra          |
+---------+--------------+------+-----+---------+----------------+
| id      | int(11)      | NO   | PRI | NULL    | auto_increment |
| content | varchar(4096) | YES  |     | NULL    |                |
+---------+--------------+------+-----+---------+----------------+
2 rows in set (0.00 sec)

mysql>
```

Bring on the database!

So now we have:

- code in our Flask app to connect to the database
- a Python definition of what we want to store in the database
- tables in the database to store the data

Let's add some code to use all of that!

```
 6
 7  SQLALCHEMY_DATABASE_URI = "mysql+mysqlconnector://{username}:{password}@{hostname}/{databasename}".format(
 8      username="barbaras",
 9      password="blutrose9",
10      hostname="barbaras.mysql.pythonanywhere-services.com",
11      databasename="barbaras$myflasksample",
12  )
13  app.config["SQLALCHEMY_DATABASE_URI"] = SQLALCHEMY_DATABASE_URI
14  app.config["SQLALCHEMY_POOL_RECYCLE"] = 299
15
16  db = SQLAlchemy(app)
17
18  class Comment(db.Model):
19      __tablename__ = "comments"
20      id = db.Column(db.Integer, primary_key=True)
21      content = db.Column(db.String(4096))
22
23  # comments = [] ## delete this, or just comment it out
24
25  @app.route('/', methods=["GET", "POST"])
26  def index():
27      if request.method == "GET":
28          # return render_template("main_page.html", comments=comments)  ## remove this line, replace with the one below
29          return render_template("main_page.html", comments=Comment.query.all())
30
31      comments.append(request.form["contents"])
32      return redirect(url_for('index'))
33
```

pythonanywhere.com

main_page.html : /home/barbaras... | flask_app.py : /home/barbaras/m... | MySQL: barbaras$myflasksampl... | Bash console 2588467 : barbar... | My comments page

pythonanywhere

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/ > home > barbaras > mysite > templates > main_page.html

Keyboard shortcuts: Normal Save Save as...

```
    integrity="sha512-dTfge/zgoMYpP7QbHy4gWMEGsbsdZeCXz7irItjcC3sPUFtf0kuFbDz/ixG7ArTxmDjLXDmezHubeNikyKGVyQ==" crossorigin="anonymous">

<title>My comments page</title>
</head>

<body>

  <nav class="navbar navbar-inverse">
    <div class="container">
      <div class="navbar-header">
        <button type="button" class="navbar-toggle collapsed" data-toggle="collapse" data-target="#navbar" aria-expanded="false"
            aria-controls="navbar">
          <span class="sr-only">Toggle navigation</span>
          <span class="icon-bar"></span>
          <span class="icon-bar"></span>
          <span class="icon-bar"></span>
        </button>
        <a class="navbar-brand" href="#">My scratchpad</a>
       </div>
    </div>
  </nav>

  <div class="container">

    {% for comment in comments %}
      <div class="row">
        {{ comment.content }}
      </div>
    {% endfor %}

    <div class="row">
      <form action="." method="POST">
        <textarea class="form-control" name="contents" placeholder="Enter a comment"></textarea>
        <input type="submit" value="Post comment">
      </form>
    </div>

  </div>

</body>
```

```
7  SQLALCHEMY_DATABASE_URI = "mysql+mysqlconnector://{username}:{password}@{hostname}/{databasename}".format(
8      username="barbaras",
9      password="blutrose9",
10     hostname="barbaras.mysql.pythonanywhere-services.com",
11     databasename="barbaras$myflasksample",
12 )
13 app.config["SQLALCHEMY_DATABASE_URI"] = SQLALCHEMY_DATABASE_URI
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21     content = db.Column(db.String(4096))
22
23 @app.route('/', methods=["GET", "POST"])
24 def index():
25     if request.method == "GET":
26         return render_template("main_page.html", comments=Comment.query.all())
27
28     # comments.append(request.form["contents"])  ## remove this line, replace with code below
29     comment = Comment(content=request.form["contents"])
30     db.session.add(comment)
31     db.session.commit()
32
33     return redirect(url_for('index'))
34
```

```
from flask import Flask, redirect, render_template, request, url_for
from flask.ext.sqlalchemy import SQLAlchemy

app = Flask(__name__)
app.config["DEBUG"] = True

SQLALCHEMY_DATABASE_URI = "mysql+mysqlconnector://{username}:{password}@{hostname}/{databasename}".format(
    username="barbaras",
    password="???",
    hostname="barbaras.mysql.pythonanywhere-services.com",
    databasename="barbaras$myflasksample",
)
app.config["SQLALCHEMY_DATABASE_URI"] = SQLALCHEMY_DATABASE_URI
app.config["SQLALCHEMY_POOL_RECYCLE"] = 299

db = SQLAlchemy(app)
```

```
class Comment(db.Model):
    __tablename__ = "comments"
    id = db.Column(db.Integer, primary_key=True)
    content = db.Column(db.String(4096))

@app.route('/', methods=["GET", "POST"])
def index():
    if request.method == "GET":
        return render_template("main_page.html", comments=Comment.query.all())

    comment = Comment(content=request.form["contents"])
    db.session.add(comment)
    db.session.commit()

    return redirect(url_for('index'))
```

main_page.html : /home/barbaras... | flask_app.py : /home/barbaras/m...

My scratchpad

This is my latest comment.

Enter a comment

Post comment

pythonanywhere.com

main_page.html : /home/barbaras... | flask_app.py : /home/barbaras/m... | MySQL: barbaras$myflasksampl... | Bash console 2588467 : barbar... | My comments page

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MySQL: barbaras$myflasksample

Share with others

```
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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> show tables;
+--------------------------------+
| Tables_in_barbaras$myflasksample |
+--------------------------------+
| comments                       |
+--------------------------------+
1 row in set (0.00 sec)

mysql> describe comments;
+---------+--------------+------+-----+---------+----------------+
| Field   | Type         | Null | Key | Default | Extra          |
+---------+--------------+------+-----+---------+----------------+
| id      | int(11)      | NO   | PRI | NULL    | auto_increment |
| content | varchar(4096) | YES  |     | NULL    |                |
+---------+--------------+------+-----+---------+----------------+
2 rows in set (0.00 sec)

mysql> select * from comments;
+----+--------------------------+
| id | content                  |
+----+--------------------------+
|  1 | This is my latest comment. |
+----+--------------------------+
1 row in set (0.01 sec)

mysql>
```

What can YOU do with a web site?

- Make a game
- Build a blog
-
-
-

What are some other ideas?

For later:

Versions

Development (unstable)
Flask 0.10.x (stable)
Flask 0.9.x

Related Topics

Documentation overview

- Previous: Quickstart
- Next: Introducing Flaskr

Quick search

Go

Tutorial

You want to develop an application with Python and Flask? Here you have the chance to learn that by example. In this tutorial we will create a simple microblog application. It only supports one user that can create text-only entries and there are no feeds or comments, but it still features everything you need to get started. We will use Flask and SQLite as database which comes out of the box with Python, so there is nothing else you need.

If you want the full sourcecode in advance or for comparison, check out the example source.

http://flask.pocoo.org/docs/0.10/tutorial/

Let's make a game!

Open a new window (File > New File) and type these lines:

```
secret_number = 7
guess = input("What number am I thinking of? ")

if secret_number == guess:
    print("Yay! You got it.")
else:
    print("No, that's not it.")
```

Choose Run > Run Module. Save to Desktop as 'guess.py'.

Games!

Open a new window (File > New File) and type these lines:

```
from random import randint

secret_number = randint(1, 10)
while True:
    guess = input("What number am I thinking of? ")

    if secret_number == guess:
        print("Yay! You got it.")
        break
    else:
        print("No, that's not it.")
```

Choose Run > Run Module. Save to Desktop as ‘guess2.py’.

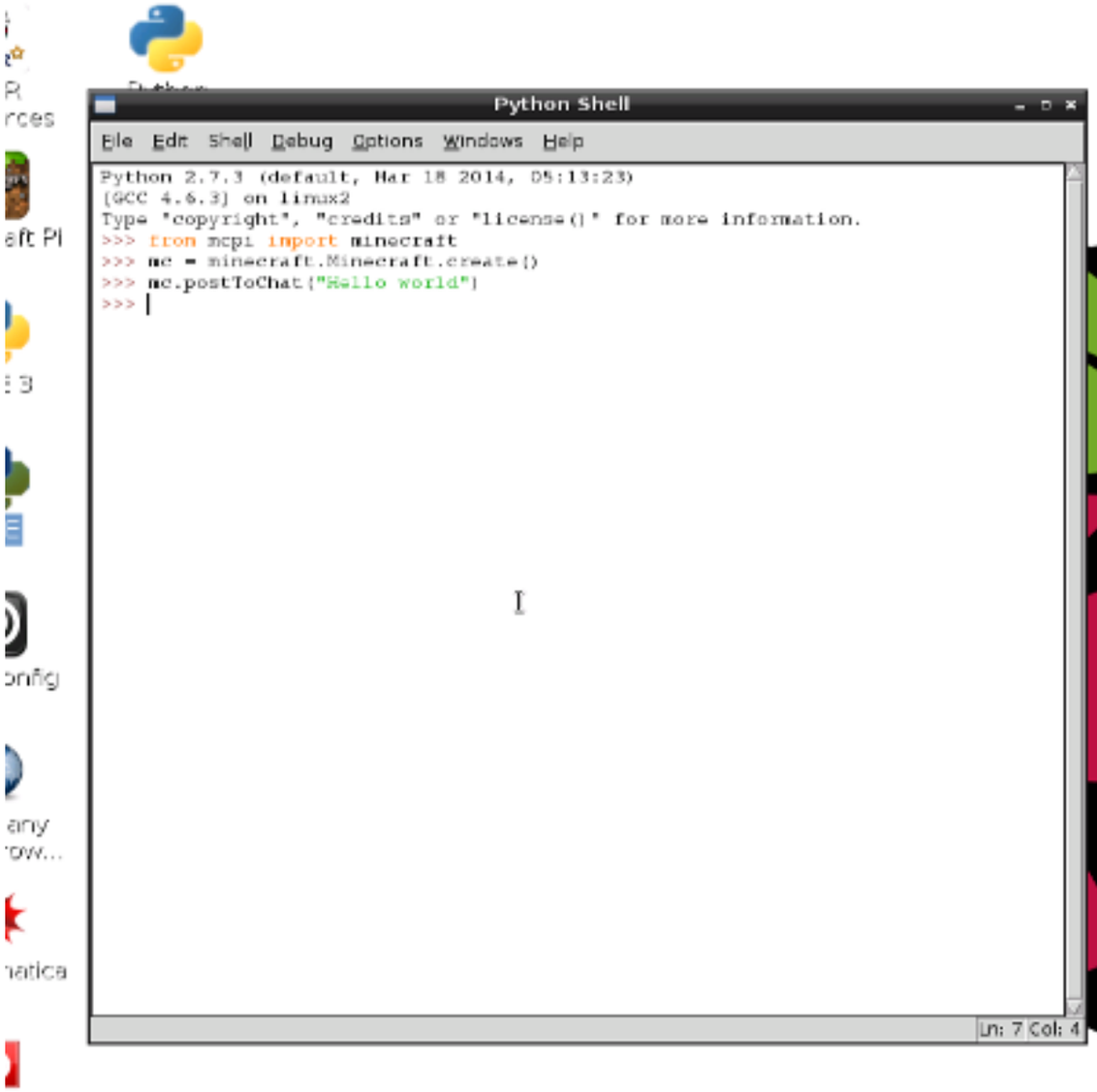
Games!

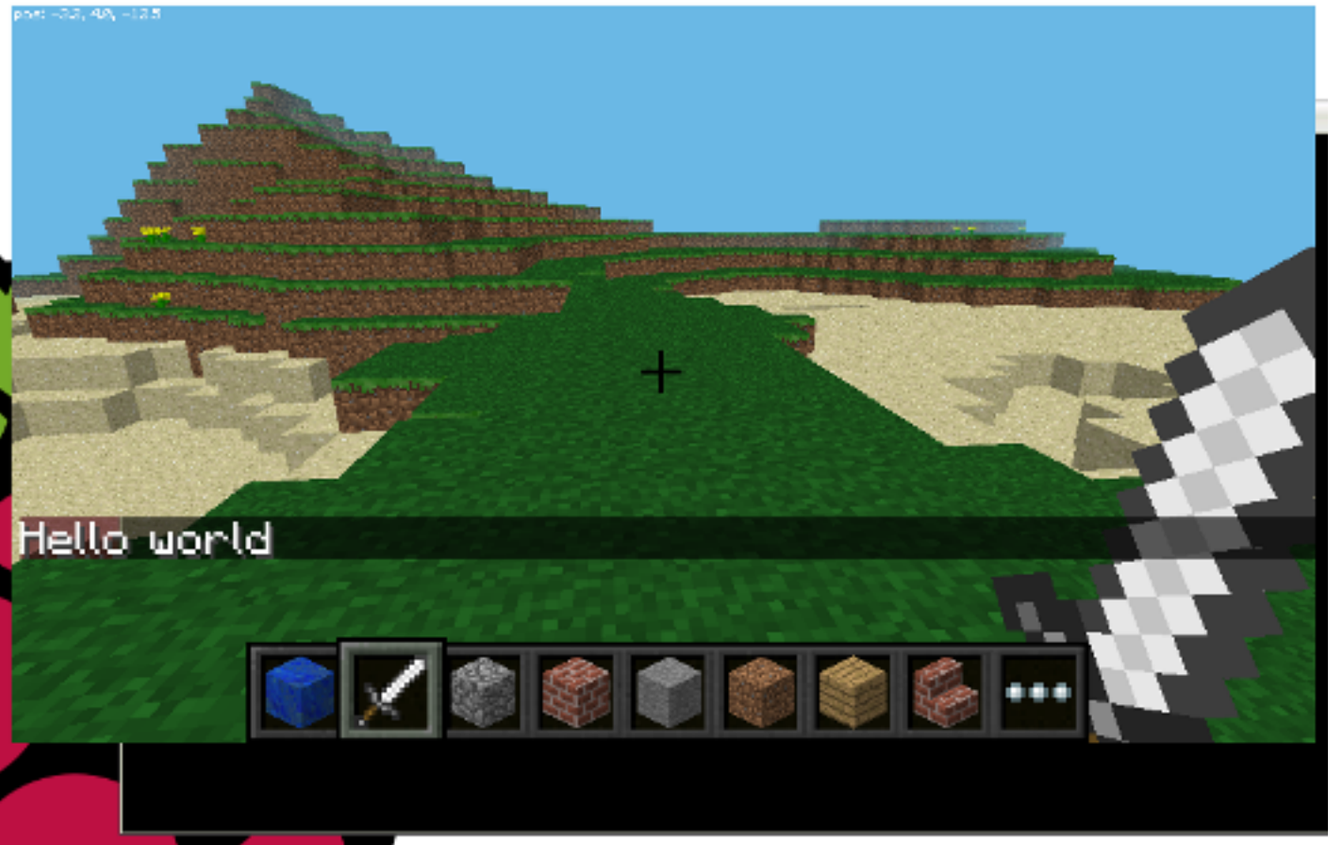
Open a new window (File > New File) and type these lines:

```
from random import randint

secret_number = randint(1, 10)
while True:
    guess = input("What number am I thinking of? ")

    if secret_number == guess:
        print("Yay! You got it.")
        break
    elif secret_number > guess:
        print("No, that's too low.")
    else:
        print("No, that's too high.")
```

Choose Run > Run Module. Save to Desktop as ‘guess3.py’.

Minecraft!


Python Shell
File Edit Shell Debug Options Windows Help
Python 2.7.3 (default, Mar 18 2014, 05:13:23)
[GCC 4.6.3] on linux2
Type "copyright", "credits" or "license()" for more information.
>>> from mcpi import minecraft
>>> mc = minecraft.Minecraft.create()
>>> mc.postToChat("Hello world")
>>>
Ln: 7 Col: 4


Hello world

Minecraft!

```
>>> from mcpi import minecraft
>>> mc = minecraft.Minecraft.create()


>>> mc.postToChat("Hello world")
```

```
>>> pos = mc.player.getPos()
>>> print pos.x, pos.y, pos.z

>>> mc.player.setPos(pos.x, pos.y+100, pos.z)

>>> mc.setBlock(pos.x+1, pos.y, pos.z, 1)
```

(Air: 0, Grass: 2, Dirt: 3)

Minecraft!

```
>>> from mcpi import block


>>> dirt = block.DIRT.id
>>> mc.setBlock(x, y, z, dirt)
```

```
>>> stone = block.STONE.id
>>> mc.setBlocks(x+1, y+1, z+1, x+11, y+11, z+11, stone)


>>> tnt = 46
>>> mc.setBlocks(x+1, y+1, z+1, x+11, y+11, z+11, tnt)
>>> mc.setBlocks(x+1, y+1, z+1, x+11, y+11, z+11, tnt, 1)
```

Congratulations!

You're now a Pythonista!

What else can you do with Python?

- Make more games
- Edit music and videos
- Build web sites
- Write a program that does your homework for you …
- Teach a robot how to move
- What are some other ideas?

Raspberry Pi

Help setting up your new computer:

http://www.raspberrypi.org/quick-start-guide

Minecraft on your new Raspberry Pi:

https://www.raspberrypi.org/learning/getting-started-with-minecraft-pi/worksheet/

http://www.stuffaboutcode.com/p/minecraft-api-reference.html