

Introduction to Python & Django

Udi h Bauman, Tikal Knowledge

Personal background

1994 -



2002 -



1997 -



2004 -

Web 2.0

1999 -



2005 -



Also in 2004

- Didn't listen to smart people :(ul>- Chief architect of a large innovative company told me to dump Java & switch to Python
 - Citing Paul Graham saying that Java is a dead leaf in the evolutionary tree of programming languages

2006 - python & **django**

- Smiling ever since
- “People who've made the switch to dynamic languages such as Python seem **much, much happier.**”
 - Bruce Eckel, Author of “Thinking in Java” & “Thinking in Python”

Python, WTF?

- Isn't this some scripting language for system administrators & the like?

What does it have to do with us –
serious Java & .Net programmers???

Python, WTF?

- Python is a modern programming language.
 - Pure OOP (Object Oriented Programming)
 - Pure AOP (Aspect Oriented Programming)
 - Pure FP (Functional Programming)

Python, WTF?

- Some companies & organization attract the best programmers in the world
- E.g.



Python, WTF?

- Turns out that the programming language of choice in most of these places is **Python**
- E.g.



Quotes

- “Python has been an important part of Google since the beginning, and remains so as the system grows and evolves”
 - Peter Norvig, Director of Research, Google

Quotes

- “Python is fast enough for our site and allows us to produce maintainable features in record times, with a minimum of developers”
 - Cuong Do, Engineering Manager, YouTube
(Watch the video: http://bit.ly/youtube_scalability)

The reason, IMHO

- Python offers the optimal combination of Power & Simplicity
 - perfect for coding Business Logic
 - perfect for any software at any size & complexity

Python demo

- Arithmetic's & Strings
- Introspection
- Formatting
- Lists, Tuples & Dictionaries
- Blocks, If & loops
- Functions
- Doctest
- Classes
- List comprehension
- I/O

Demo screenshots

```
Command Prompt - python
C:\>python
Python 2.6.2 (r262:71605, Apr 14 2009, 22:40:02) [MSC v.1500 32 bit (Intel)] on
win32
Type "help", "copyright", "credits" or "license" for more information.
>>> print 'Hello world'
Hello world
>>> 4 + 5 * 6
34
>>> s = 'Python'
>>> t = ' is cool'
>>> s + t
'Python is cool'
>>> s * 3
'PythonPythonPython'
>>> t.strip()
'is cool'
>>> s[0]
'p'
>>> s[3:6]
'hon'
>>> type(s)
<type 'str'>
>>> dir(t)
['_add_', '_class_', '_contains_', '_delattr_', '_doc_', '_eq_', '_
format_', '_ge_', '_getattr_', '_getitem_', '_getnewargs_', '_get
slice_', '_gt_', '_hash_', '_init_', '_le_', '_len_', '_lt_', '_mo
d_', '_mul_', '_ne_', '_new_', '_reduce_', '_reduce_ex_', '_repr_',
'_rmod_', '_rmul_', '_setattr_', '_sizeof_', '_str_', '_subclasshook
_', '_formatter_field_name_split_', '_formatter_parser_', '_capitalize_', '_center_',
'_count_', '_decode_', '_encode_', '_endswith_', '_expandtabs_', '_find_', '_format_', '_index
_', '_isalnum_', '_isalpha_', '_isdigit_', '_islower_', '_isspace_', '_istitle_', '_isupper_',
'_join_', '_ljust_', '_lower_', '_lstrip_', '_partition_', '_replace_', '_rfind_', '_rindex_',
'_rjust_', '_rpartition_', '_rsplit_', '_rstrip_', '_split_', '_splitlines_', '_startswith_',
'_strip_', '_swapcase_', '_title_', '_translate_', '_upper_', '_zfill_']
>>> t.title._doc_
'S.title() -> string\n\nReturn a titlecased version of S, i.e. words start with
uppercase\ncharacters, all remaining cased characters have lowercase.'
>>> "My name is {fname} {lname}".format(fname="Udi", lname="Bauman")
'My name is Udi Bauman'
>>> data = [42, 'foo', 3.14]
>>> data.append('bar')
>>> for item in data:
...     print item
...
42
foo
3.14
bar
>>>
```

Demo screenshots

```
CA Command Prompt - python
foo
3.14
bar
>>> immutable_data = (42, 'foo', 3.14)
>>> immutable_data.append('bar')
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
AttributeError: 'tuple' object has no attribute 'append'
>>> dict = {"title": "Django tutorial", "location": "TLU"}
>>> dict["year"] = 2009
>>> for k in dict:
...     print k, "=", dict[k]
...
year = 2009
location = TLU
title = Django tutorial
>>> for k, v in dict.items():
...     print "<key>=<val>".format(key=k, val=v)
...
year=2009
location=TLU
title=Django tutorial
>>> i = 0
>>> while i < 5:
...     print i
...     i += 1
...
0
1
2
3
4
>>> temp = 26
>>> if temp <= 0:
...     print "freezing"
... elif temp < 15:
...     print "cold"
... else:
...     print "hot"
...
hot
>>> data = [13, -2, 9]
>>> data2 = [x*2 for x in data if x > 0]
>>> data2
[26, 18]
>>> def factorial(n):
...     return n * factorial(n-1) if n > 1 else 1
...
>>> factorial(5)
120
>>>
```


Python libraries

- Real wealth of libraries
- The Python Package Index (PyPi) lists 7.7K
- Cover almost any functionality & need
- Very easy to install
- Very intuitive
 - Work just as you expect them to work

Python summary

- Python has many advantages, but the bottom line is:
 - Happy management
 - Happy staff
 - Happy customers
- Don't take my word – Google what people say about their experience with Python & tell me if you find any counter-example

Python summary

- What's in it for us?
 - Need implement a new complex system or service?
 - Prototype it in Python
 - Then realize that it's ready for usage

Introduction to Django

- Leading Python Web Framework
- Good for any service, no just Web apps

Django slogan

- The Web framework for **Perfectionists** with **deadlines**

Perfectionists?

- Emphasizing clean MVC design
- Django apps are reusable by design
- Based on Best-Practices
- Extremely easy to unit-test

Deadlines?

- Grown in the Online Newspapers industry
 - Designed to make development fast
 - E.g., automatic admin interface
- Automates repetitive tasks
- Leading technology in new US Startups, according to recent polls

Quotes

- “After an extensive trade study, we selected Django as the first and primary application environment for the Nebula Cloud. ”

– NASA,

<http://nebula.nasa.gov/services/framework>

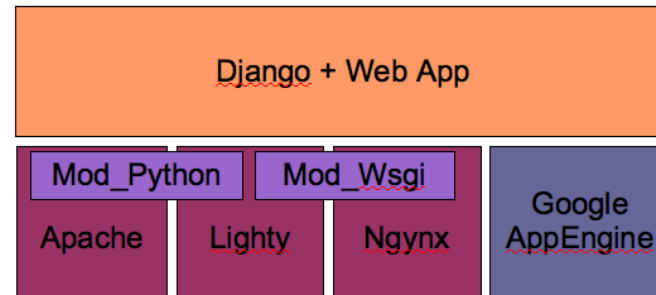
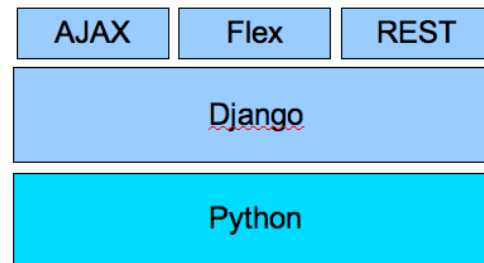
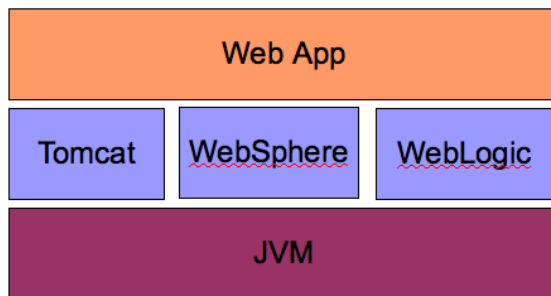
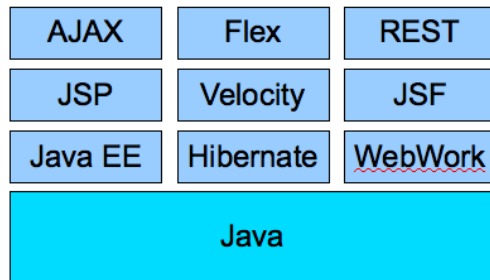
Model & basis of



Main features

- ORM
- Admin
- URL's design
- Auth
- Template engine
- Integrated GIS
- Reusable apps
- Unit testing
- Middleware
- Caching
- I18N

Comparison with Java stacks



Lots of reusable apps

- Hundreds of pluggable apps exist, for almost any purpose
- Very easy to plug into your project
 - Adds complete functionality, integrated with your application

How do you develop/run?

- I use the Eclipse-based Aptana IDE
- I run Django on LAMP (Linux, Apache, MySQL/Postgres, Python) or AppEngine
 - You can also deploy Django as .war on any Java Application Server

Django demo

- Let's write a small Django app for project management
 - Manage projects & tasks
 - Manage users & roles
 - Rich UI (search, filters, recent actions list)
 - Project health indicators
 - Tasks focus chart

Demo screenshots

The screenshot displays the Django administration interface in a web browser. The browser's address bar shows the URL `http://localhost:8000/admin/`. The page title is "Site administration | Django site admin".

The main content area is titled "Site administration" and features a navigation menu on the left with the following items:

- Auth**
- Groups [+ Add](#) [Change](#)
- Users [+ Add](#) [Change](#)
- Sites**
- Sites [+ Add](#) [Change](#)
- Tasks**
- Projects [+ Add](#) [Change](#)
- Tasks [+ Add](#) [Change](#)

On the right side, there is a "Recent Actions" section titled "My Actions" containing a list of performed actions:

- [Send ideas on how to build an R-forum](#)
Task
- [Find people that would like to join](#)
Task
- [H task](#)
Task
- [R-forum](#)
Project
- [udi](#)
User

The browser's tab bar shows several open tabs, including "annotated living", "YouTube - 10 בערוץ א...", "Tikal Mail", "Twuffer", "BackOffice @ Amazon", and "רדיו קול המזח... - מנגן עכשיו XW".

Demo screenshots

Select project to change | Django site admin

http://localhost:8000/admin/tasks/project/

Bookmark on Delicious Tikal Mail Twuffer BackOffice @ Amazon רדיו קול המזח... מנגן עכשיו XW annotated living

Django administration Welcome, admin. Documentation / Change password / Log out

Home > Tasks > Projects

Select project to change

Search: Go

Action: Go

<input type="checkbox"/>	Name	Is active	Leader	Priority	Health indicator	Tasks	Last update
<input type="checkbox"/>	R-forum	Yes	udi	Low	1-late, 1-on-track, 1-done	List Focus diagram	Sept. 17, 2009, 3:31 p.m.

1 project

Filter

- By is active
 - All
 - Yes
 - No
- By leader
 - All
 - admin
 - udi
- By priority
 - All
 - Urgent
 - High
 - Medium
 - Low

Demo screenshots

Django administration Welcome, admin. Documentation / Change password / Log out

Home > Tasks > Projects > Add project

Add project

Name:

Description:

Is active

Leader: Person leading this project

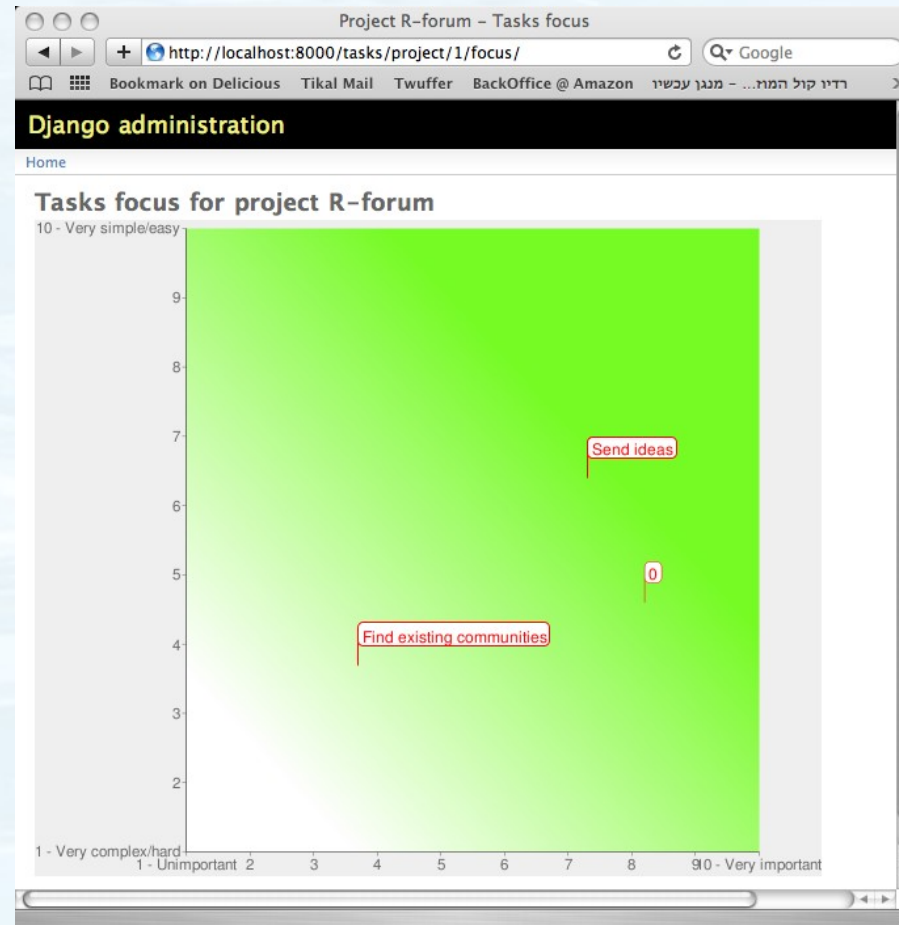
Priority:

Tasks

Name	Description	Assigned to	Due in	Done	Simplicity	Value	Dependencies	Delete?
<input type="text"/>	<input type="text"/>	<input type="text"/>	Date: <input type="text"/> Today <input type="text"/> Time: <input type="text"/> Now <input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	Find people that would like to join Send ideas on how to build an R-forum H task	<input type="checkbox"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	Date: <input type="text"/> Today <input type="text"/> Time: <input type="text"/> Now <input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	Find people that would like to join Send ideas on how to build an R-forum H task	<input type="checkbox"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	Date: <input type="text"/> Today <input type="text"/> Time: <input type="text"/> Now <input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	Find people that would like to join Send ideas on how to build an R-forum H task	<input type="checkbox"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	Date: <input type="text"/> Today <input type="text"/> Time: <input type="text"/> Now <input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	Find people that would like to join Send ideas on how to build an R-forum H task	<input type="checkbox"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	Date: <input type="text"/> Today <input type="text"/> Time: <input type="text"/> Now <input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	Find people that would like to join Send ideas on how to build an R-forum H task	<input type="checkbox"/>

[Save and add another](#) [Save and continue editing](#) [Save](#)

Demo screenshots



Java/.Net vs. Django

- Think how much code it would take in Java or .Net
 - Common
 - BI
 - DAL
 - Basic
 - Logic
 - API

Java/.Net vs. Django

- Damn, Django does the same thing without all the complexity & verbosity
- How much time & cognitive effort it takes to learn, understand & modify it?

Django summary

- What's in it for us?
 - Nothing
 - you can afford developing systems using 10 developers for several weeks
 - instead of 1-2 developers for several days :)

Django summary

- Seriously:
 - Need implement a new system?
 - Prototype it in Django in a few hours
 - Then realize that it's ready for production