Technische Universität München

Python and Django – The elephant in the room (Part 2)

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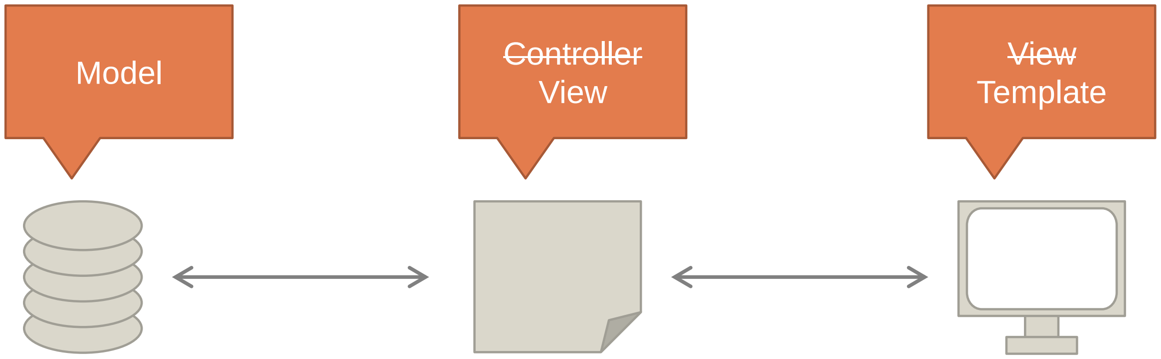
What we know already?

Develop a basic application



Model

~~Controller~~
View

~~View~~
Template

How to proceed

- Clone the Application if you want…
- Take the app "webtech-skeleton"

https://github.com/Phylu/webtech-django2.git

Have a Look at some code…

Overview

1. **Object Relational Mapping**
   - Retrieving Objects
   - Filtering
   - Aggregation & Annotation

2. **Tests**
   - Unittests
   - Webserver Response Tests

3. **Middleware**
   - Messages
   - Sessions

4. **Translation (If still time)**
   - Defining Translation
   - Translation Files

Object Relational Mapping

ORM is a technique to map objects to a relational database.
Objects can be easily added, retrieved, changed and deleted.
Model is mapped to table. Attribute is mapped to column.

Backend Storage

```
sqlite> select * from
scorecard_course;

id l_id  course_title  votes
-  ----  ------------  -----
1  2     Webtech       5
2  1     Global Softw  1
3  1     Web Applicat  0
4  2     Gründung und  1
5  4     Software Eng  0
```

Access

```
c = Course.objects.get(pk=1)

c = get_object_or_404(Course, pk=1)

for c in Course.objects.all():
    print (c)
```

Object Relational Mapping

- Retrieving Objects:

```
Course.objects.get(pk=1)
Course.objects.all()
Course.objects.order_by('-votes')
```

- Filtering:

```
Course.objects.filter(votes__gte=42)

Lecturer.objects.filter(
       first_name__exact=F('last_name'))

Lecturer.objects.filter(
       Q(first_name__contains='Alex') |
       Q(last_name__contains='Shumaiev'))
```

Write some code...

Object Relational Mapping

- Aggregation:

  ```
  Course.objects.aggregate(Avg('votes'))[
         'votes__avg']
  ```

- Annotation:

  ```
  Course.objets.values('lecturer').
         annotate(avg_votes=Avg('votes'))
  ```

- Raw SQL: Check Documentation

Write some more code...

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Testing

- As real software engineers, we want automated testing.

- Djangos test framework does:
  - Unittests
    - Direct Test of algorithmic
    - Mainly to test models and views
  - Client–Webserver Tests
    - Test how webserver answers requests
    - Mainly to test views and templates
  - Selenium Tests (not covered here)
    - Test how the page looks
    - Test integration of all parts

Testing

- Productive data is not touched

- Testing environment based on your needs:

```
def setUp(self):
  """ Create some courses & lecturers """
  pass
```

- Run: `./manage.py test`

Write even more code...

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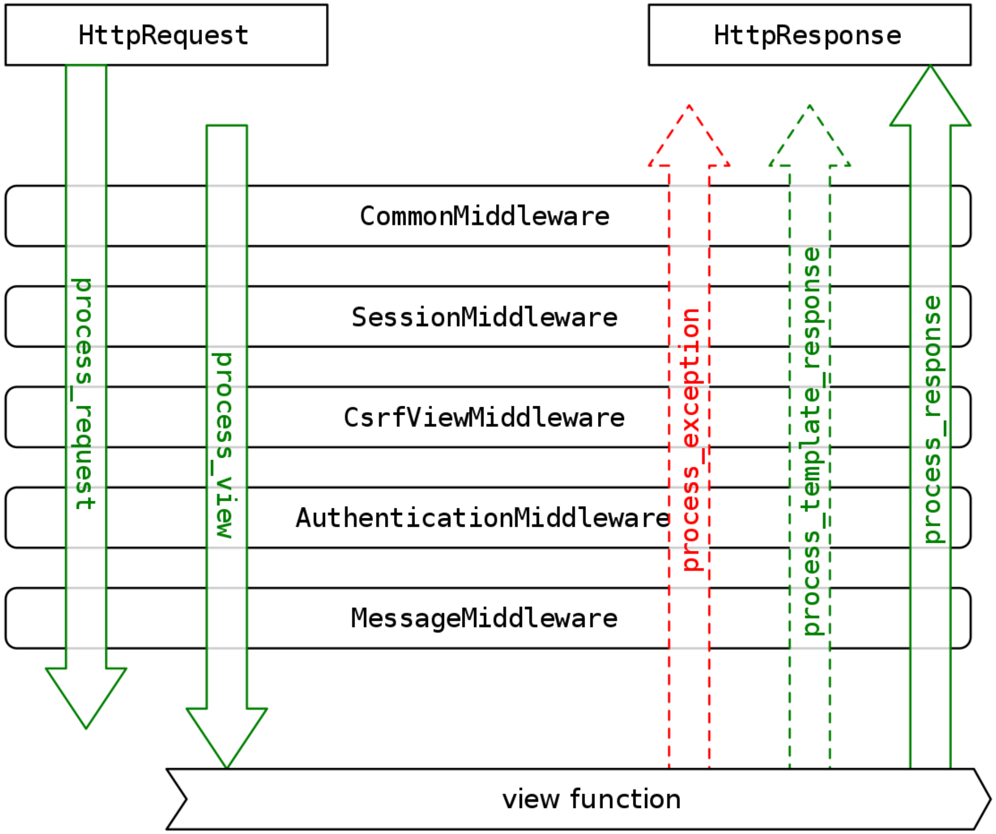
Middlewares

- Middlewares hook in between HttpRequest/Response and Django view



Source: https://docs.djangoproject.com/en/1.8/topics/http/middleware/

Middlewares

- Middlewares add functionality to request handling:

- Auth:

```
if request.user.is_authenticated():
    …          # Do something for authenticated users.
else:
    ...        # Do something for anonymous users.
```

- Message:

```
messages.add_message(request, messages.ERROR,
       "You have already voted!")
```

- Session:

```
request.session['has_voted'] = True
request.session.get('has_voted', False)
```

Write code, again...

Middlewares

Want to write your own Middleware?

- Just implement (one of):
  process_request(request)
  process_view(request, view_func, view_args, view_kwargs)
  process_template_response(request, response)
  process_response(request, response)
  process_exception
- Then rigster your middleware in the config

Comparison

Django vs. other Web Frameworks

Pro Django

- It is Python! (e.g. easy readable)
- Very defensive (no standard null fields)
- Apps and namespaces

Contra Django

- Probably overloaded for small pages (defaults)

Thank you for your time!

Any Questions?

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Overview [We still have too much time…]

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Translation

- Internationalizing your django application for an international audience? Define your translation strings

- Views:

```
from django.utils.translation import
       ugettext as _
...
messages.add_message(request, messages.ERROR,
       _("You have already voted!"))
```

- Templates:

```
{% load i18n %}
{% trans "Home" %}
{% blocktrans count counter=course.votes %}
       {{ counter }} vote.
{% plural %}
       {{ counter }} votes.
{% endblocktrans %}
```

Code the last example...

Translation

- Create Translation File:
  `django-admin.py makemessages -l de`

- This creates "/locale/de/LC_MESSAGES/django.py"

```
#: templates/scorecard/base.html:20
msgid "Home"
msgstr "Start"

#: templates/scorecard/index.html:10
#, python-format
msgid "%(counter)s vote."
msgid_plural "%(counter)s votes."
msgstr[0] "%(counter)s Stimme."
msgstr[1] "%(counter)s Stimmen."
```

Add some code…

Translation

- Compile the translation:

```
django-admin.py compilemessages
```

- Django determines the language by:
  - Cookie
  - Browser settings
  - Django application default language

Just a last command in the terminal…

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