Web Development Paradigms and how django and GAE webapp approach them.

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Agiliq Solutions

PYCON INDIA-2010

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Programming paradigm

From Wikipedia, the free encyclopedia

This article **needs attention from an expert on the subject**. See the talk page for details.
WikiProject Computer science or the Computer science Portal may be able to help recruit an expert.
(January 2009)

A **programming paradigm** is a fundamental style of computer programming. (Compare with a methodology, which is a style of solving specific software engineering problems.) Paradigms differ in the concepts and abstractions used to represent the elements of a program (such as objects, functions,

Concepts and abstractions used to represent elements of a program

Contents [hide]

1 Overview
2 Multi-paradigm programming language
3 History
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Programming paradigms

- Agent-oriented
- Component-based
- Concatenative
- Concurrent computing
- Declarative (contrast: Imperative)
  - Functional
    - Dataflow
      - Cell-oriented (spreadsheets)
      - Reactive
  - Constraint
  - Logic
    - Constraint logic
    - Abductive logic
    - Inductive logic
- Event-driven
  - Service-oriented
  - Time-driven
- Expression-oriented
- Feature-oriented
- Function-level (contrast: Value-level)
- Imperative (contrast: Declarative)
  - Procedural
- Non-structured (contrast: Structured)
- Array (contrast: Scalar)

Overview [edit]

Programming model: Abstraction of a computer system, for example the "von Neumann model" used in traditional sequential computers. For parallel computing, there are many possible models typically reflecting different ways processors can be interconnected. The most common are based on shared memory, distributed memory with message passing, or a hybrid of the two.

A programming language can support multiple paradigms. For example programs written in C++ or Object Pascal can be purely procedural, or purely object-oriented, or contain elements of both paradigms. Software designers and programmers decide how to use those paradigm elements.

In object-oriented programming, programmers can think of a program as a collection of interacting objects, while in functional programming a program can be thought of as a sequence of stateless function evaluations. When programming computers or systems with many processors, process-oriented programming allows programmers to think about applications as sets of concurrent processes

Web Development Paradigms: Modeling common web patterns

Why?

django

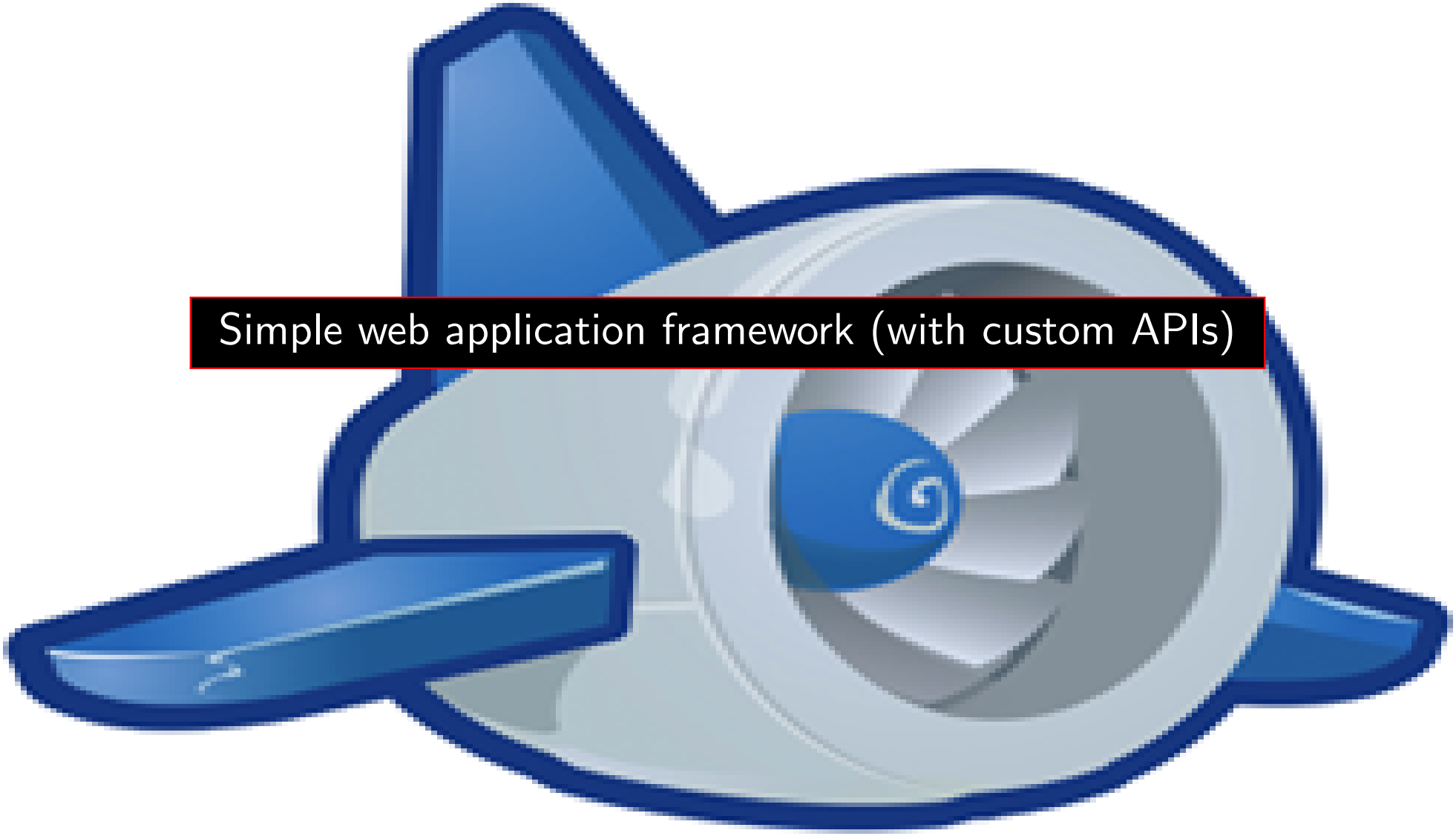
Batteries Included

docs.djangoproject.com/en/1.2/

Other batteries included

- Admin site | Admin actions
- Authentication
- Cache system
- Conditional content processing
- Comments | Moderation | Custom comments
- Content types
- Cross Site Request Forgery protection
- Databrowse
- E-mail (sending)
- Flatpages
- GeoDjango
- Humanize
- Internationalization
- Jython support
- "Local flavor"
- Messages
- Pagination
- Redirects
- Serialization
- Sessions
- Signals
- Sitemaps
- Sites
- Syndication feeds (RSS/Atom)
- Unicode in Django
- Web design helpers
- Validators

docs.djangoproject.com

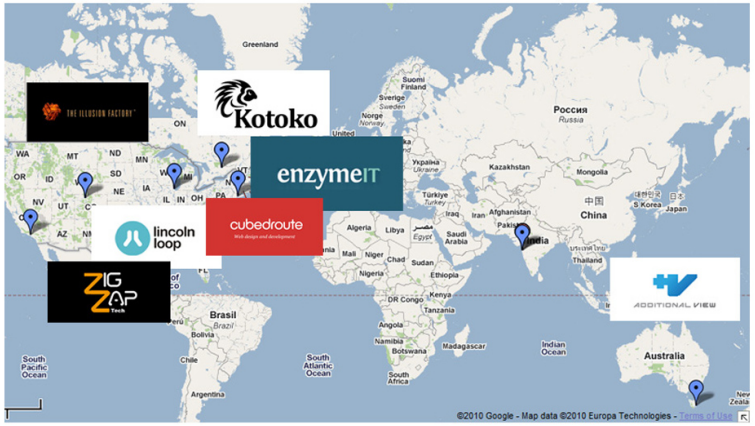


Simple web application framework (with custom APIs)

Lets examine the batteries

How do I know about web development or django

- Active Djangonaut
- Part of a few popular open source django applications github.com/becomingGuru, github.com/agiliq
- Consulting and Development via AGILIQ SOLUTIONS
- Developed several custom proprietory django applications



- @becomingGuru

Introduction

Forms

Authentication

Generic Views

Caching

Others

Admin

Forms

Account not verified SEND VERIFICATION LINK

No file selected Choose File

About me :

This is my profile

* Username : whitekites

* E-mail address: ashok.raavi@yahoo.co.in

First name :

Last name :

Date of birth 1980-06-19

Gender Male

CHANGE PASSWORD

Save form data to a table

Company name : clearthoughtsolutions

Company webpage : http://www.clearthoughtsolutions

Banner image : No file selected Choose File

Phone number : 1234567890

Fax number : 123546789

Address Line 1 : 555 west kinzie st

Address Line 2 : apt#E1712

City : chicago

State : IL

Zip code : 60654

Country : USA

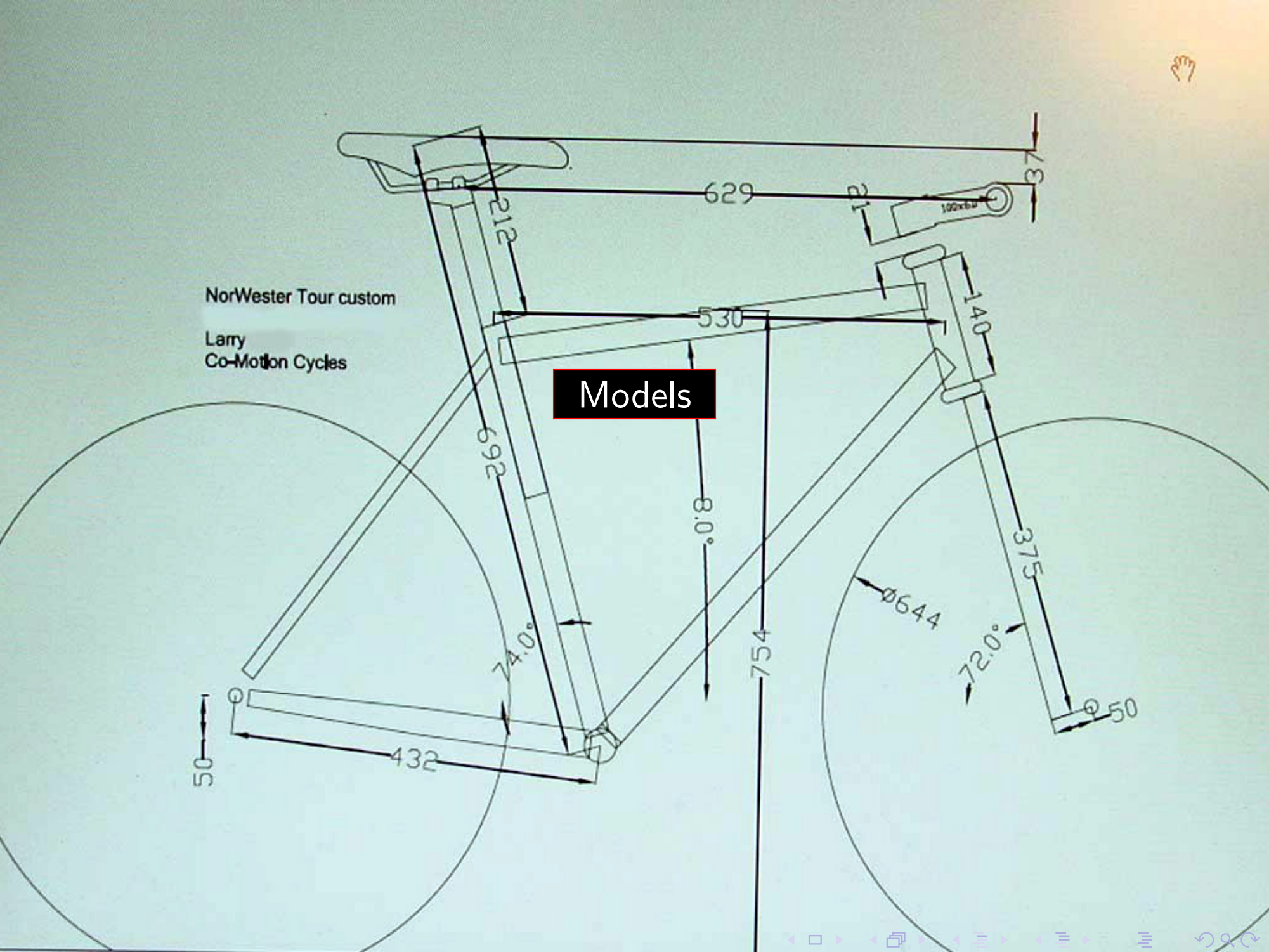
Daytime Phone : 5736804656 ext.

Evening Phone : 3127420983 ext.

SAVE PROFILE

Use a Model Form

```
>>> from django.forms import ModelForm

# Create the form class.
>>> class ArticleForm(ModelForm):
...     class Meta:
...         model = Article

# Creating a form to add an article.
>>> form = ArticleForm()

# Creating a form to change an existing article.
>>> article = Article.objects.get(pk=1)
>>> form = ArticleForm(instance=article)
```


NorWester Tour custom
Larry
Co-Motion Cycles
629
37
12
212
530
140
692
80°
754
375
Ø644
74.0°
72.0°
50
432
50

Models

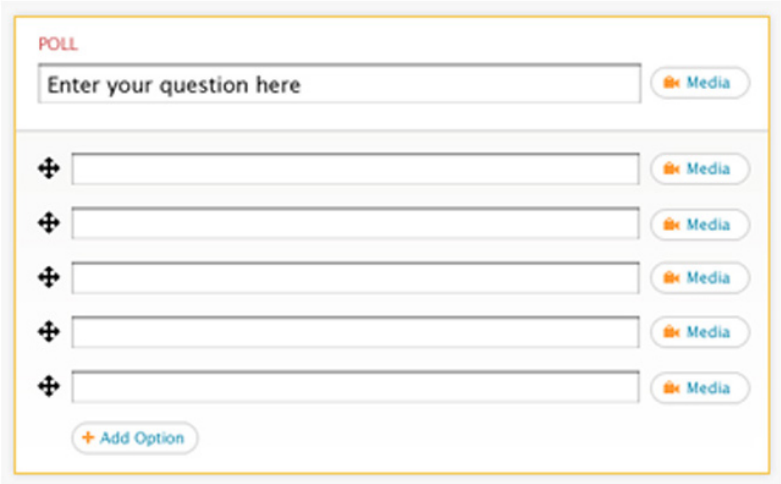
Model Syntax

```
from django.db import models

class Post(models.Model):
    title = models.CharField(max_length=100)
    text = models.TextField()
    datetime = models.DateTimeField()

    class Meta:
        ordering = ('-datetime',)

    def __unicode__(self):
        return self.title

class Comment(models.Model):
    post = models.ForeignKey(Post)
    text = models.TextField()
```

Model API

```
>>>from blog.models import Post, Comment
>>>post = Post.objects.all()[0]
>>>post_comments = post.comment_set.all()
```

Save Foreign Keys



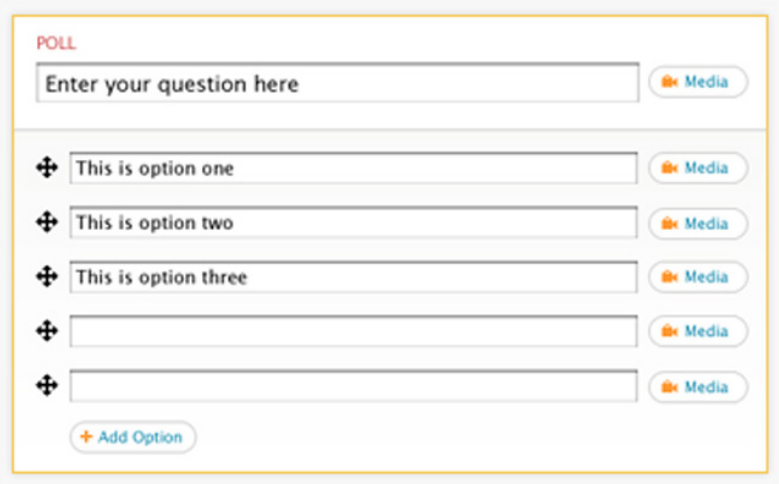
Use Model Formset

```
from django.forms.models import modelformset_factory
AuthorFormSet = modelformset_factory(Author)
formset = AuthorFormSet()
>>> print formset
<input type="hidden" name="form-TOTAL_FORMS"
value="1" id="id_form-TOTAL_FORMS" />
<input type="hidden" name="form-INITIAL_FORMS"
value="0" id="id_form-INITIAL_FORMS" />
<input type="hidden" name="form-MAX_NUM_FORMS"
id="id_form-MAX_NUM_FORMS" />
<tr><th>
<label for="id_form-0-name">Name:</label>
</th><td>
<input id="id_form-0-name" type="text"
name="form-0-name" maxlength="100" />
</td></tr>
```

Model Formset options

```
formset = AuthorFormSet(qs=Author.objects.all(),
                        extra=5)

formset.is_valid()

formset.errors
{'name': 'This field is required'}

formset.changed_forms

formset.save()
```

Form pre populated



Forms dont have to save to a Model

```
from django import forms

class ContactForm(forms.Form):
    subject = forms.CharField(max_length=100)
    message = forms.CharField()
    sender = forms.EmailField()
    cc_myself = forms.BooleanField(required=False)

    def save(self):
    #Do anything
    ...
```

Select "Submit" if this information is correct to complete Step 10: Review Electronic Funds Transfer (EFT) Information. After submission, the Review Electronic Funds Transfer (EFT) Verification page will display requesting

Final Verification

Select "Cancel" to return to the Reconciliation Checklist and Step 10 will remain in an "Incomplete" status.

Account Information:

Bank Name: My Bank
Account Type: Savings
Company Name Associated with Account: Company 1
Account Number: 123445566
Bank Routing Number: 112233448

Bank Contact

First Name: Joseph
Middle Initial: R
Last Name: Smith

Telephone: (123) 555-9292 ext.:
Fax: (123) 555-9293

E-mail Address:

Bank Address

Street Line 1: 123 Main Street
Street Line 2:
City: Boulder
State: COLORADO
Zip Code: 22222-1111

Confirm Cancel

Form Preview

Form Preview

```
from django.contrib.formtools.preview import FormPreview
from myapp.models import SomeModel

#Add a url
(r'^post/$', SomeModelFormPreview(SomeModelForm)),

#Define form preview

class SomeModelFormPreview(FormPreview):

    def done(self, request, cleaned_data):
        # Do something with the cleaned_data, then
        # redirect to a "success" page.
        return HttpResponseRedirect('/form/success')
```

1 2 3 4

STEP 1: CREATE YOUR FORM

It will only take 4 simple steps for you to create and use your new form. To start, enter a name for your form below. If you have an existing form you want to import, select one of the import methods below. Otherwise, start with a pre-built or blank form.

Form Wizard

*Form Name

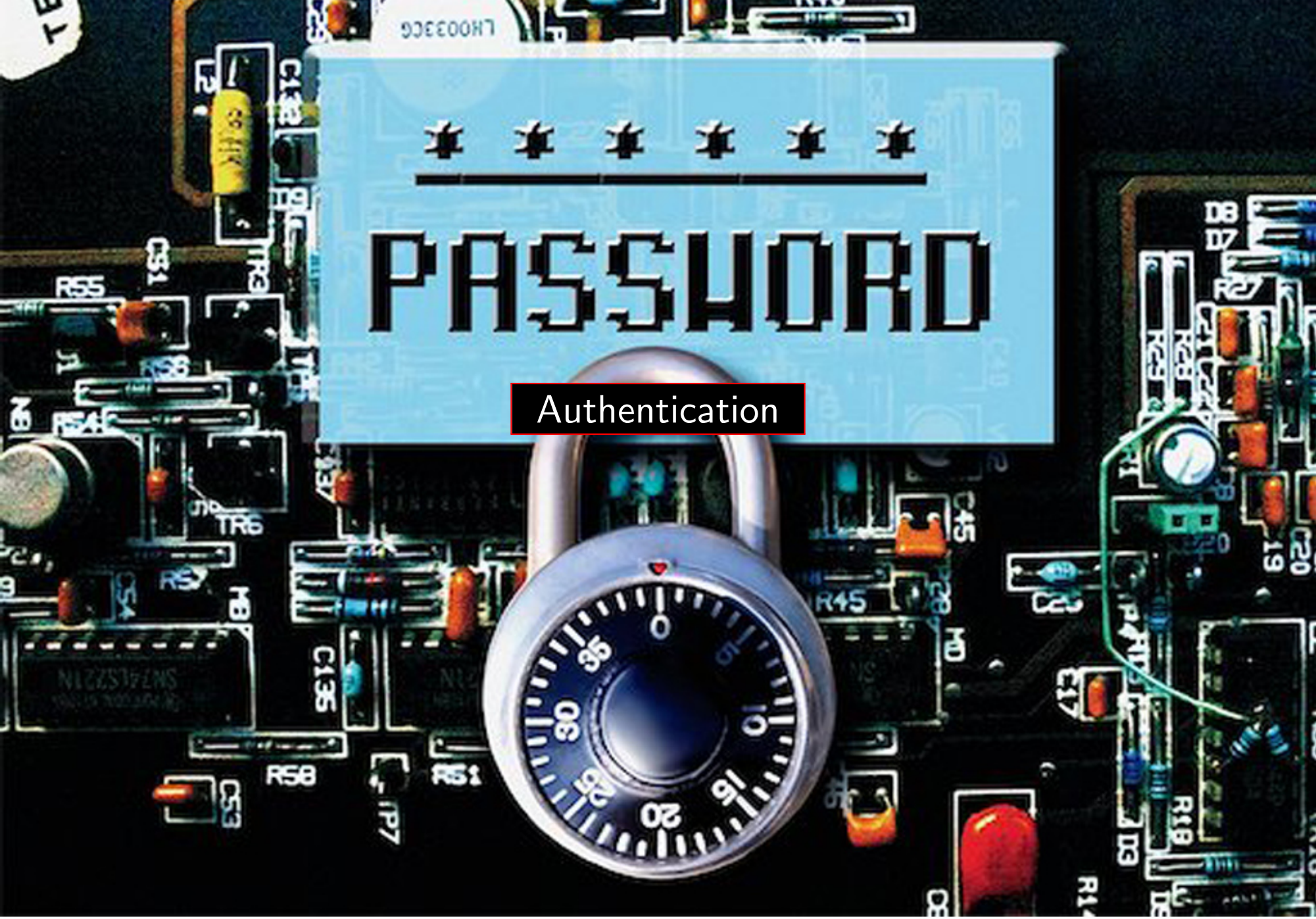
*Start With

- (•) Pre-built form: Contact Form
- ( ) Copy an existing form from a webpage
- ( ) Upload an HTML file containing a form
- ( ) Blank form

Next Step ▶

Form Wizard

```
class ContactWizard(FormWizard):
    def done(self, request, form_list):
        do_something_with_the_form_data(form_list)
        return HttpResponseRedirect('/page-to-redirect-t
```



Authentication

Point to url pattern

```
urlpatterns += patterns('registration.views',

    url(r'^login/$', auth_views.login, name='auth_login'
    url(r'^logout/$', auth_views.logout, name='auth_logo
    url(r'^register/$','register',name='register_view'),
    url(r'^passreset/$',auth_views.password_reset,
        name='forgot_password1'),
    url(r'^passresetdone/$',auth_views.password_reset_don
        name='forgot_password2'),
    url(r'^passresetconfirm/(?P<uidb36>[-\w]+)/(?P<token
        auth_views.password_reset_confirm,
        name='forgot_password3'),
    url(r'^passresetcomplete/$',auth_views.password_rese
        name='forgot_password4'),
    )
```

Login Required

```
from django.contrib.auth.decorators import login_require

@login_required(redirect_field_name='redirect_to')
def my_view(request):
    ...
```

Authentication backends

```
from django.conf import settings
from django.contrib.auth.models import User, check_passw

class SettingsBackend:
    """
    Authenticate against the settings ADMIN_LOGIN and AD
    """
    def authenticate(self, username=None, password=None)
        if login_valid and pwd_valid:
            return user
        return None

    def get_user(self, user_id):
        try:
            return User.objects.get(pk=user_id)
        except User.DoesNotExist:
            return None
```

Dinette

Forum based on dinette. Discuss about web application development using django and the related tech stack.

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Please click your account provider:

Google YAHOO! AOL OpenID

django-socialauth

Sign-in or Create New Account via twitter

twitter Connect

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DEAR Stephen,

THANK YOU SO MUCH FOR THE LOVELY knife. IT IS VERY sharp, AND IT WILL LOOK sharp, IN OUR kitchen.

Send to template

I AM SURE IT WILL GIVE US MANY HAPPY HOURS cutting things.

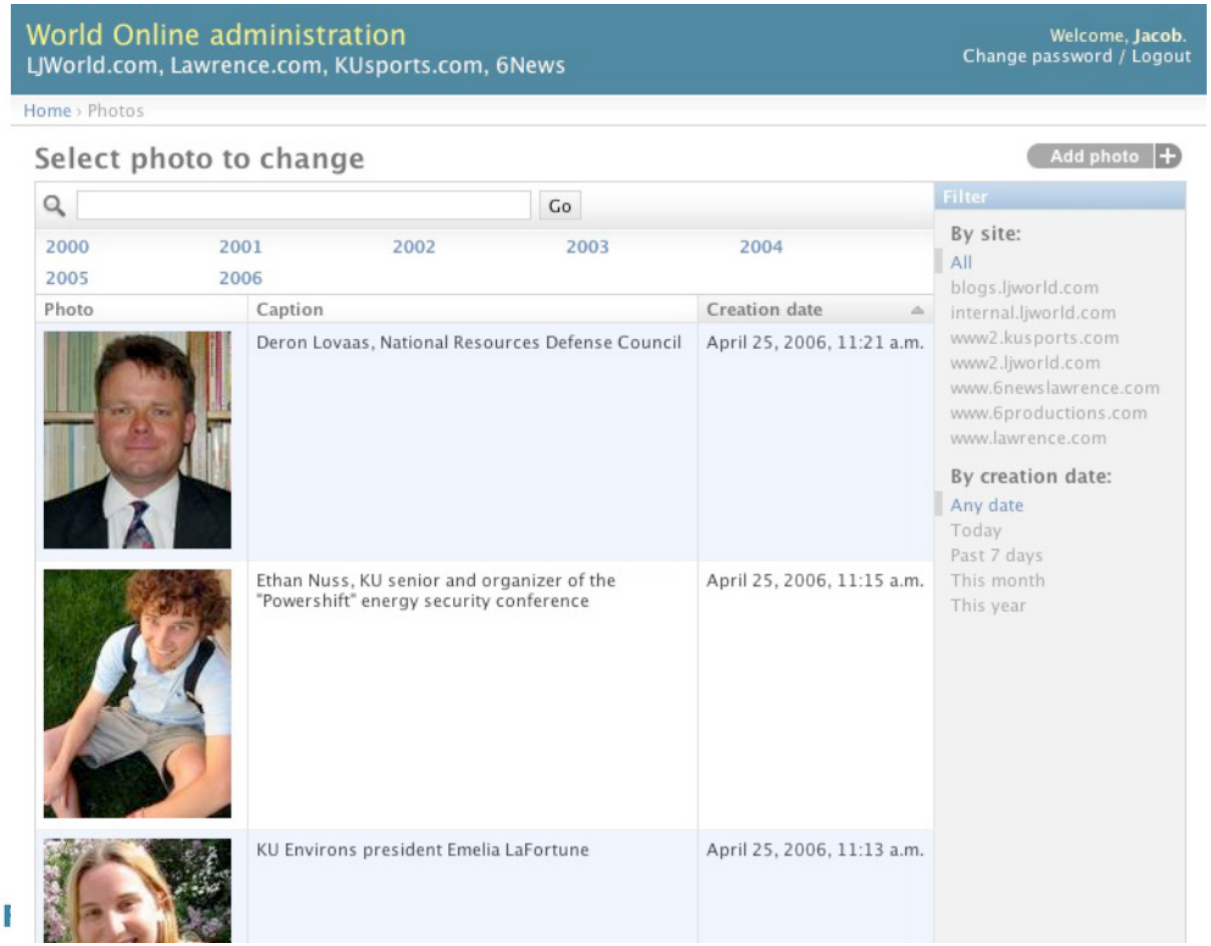
IT WAS nice TO SEE YOU AT THE WEDDING, AND WE SHOULD DEFINITELY MEET UP NEXT TIME WE ARE IN Canada.

MUCH LOVE, PETER + Victoria

Generic Views

```
from django.conf.urls.defaults import *
from django.views.generic.simple \
import direct_to_template

urlpatterns = patterns('',
    ('^about/$', direct_to_template, {
        'template': 'about.html'
    })
)
```

Object based generic views



Display objects and their lists

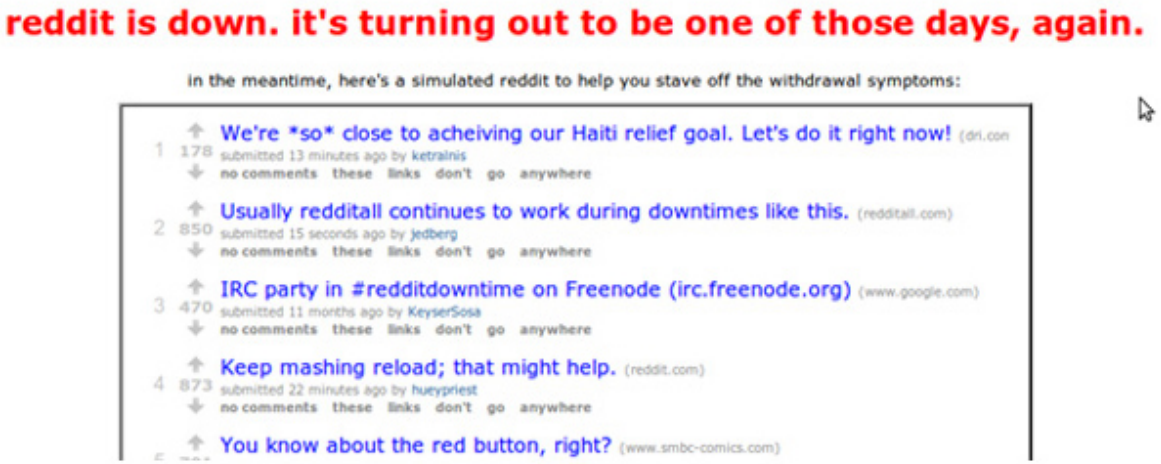
```
from django.views.generic.list_detail import \
      object_detail, object_list
url((r'^objects/page(?P<page>[0-9]+)/$',
     object_list,
     dict(info_dict)),
     (r'^objects/(?P<id>[0-9]+)/$',
     object_detail,
     dict(info_dict)),
)
```

List of generic views

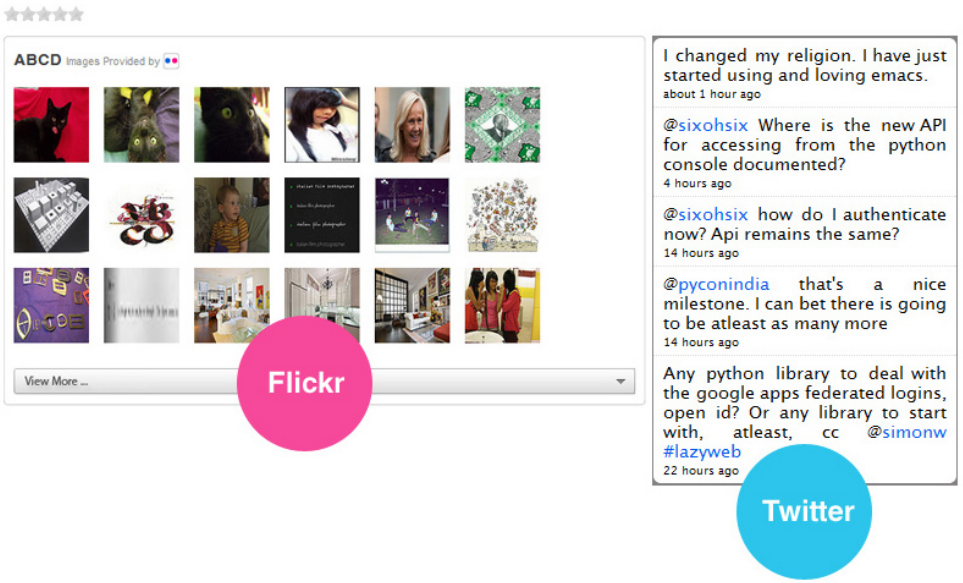
```
django.views.generic.simple.direct_to_template
django.views.generic.simple.redirect_to

django.views.generic.list_detail.object_list
django.views.generic.list_detail.object_detail

django.views.generic.create_update.create_object
django.views.generic.create_update.update_object
django.views.generic.create_update.delete_object
```

reddit and friends

"Normalized data is for sissies" - Cal Henderson



Different blocks need different caching durations



Generally Memcache Every page

```
CACHE_BACKEND = 'memcached://127.0.0.1:11211/'
CACHE_BACKEND = 'memcached://172.19.26.240:11211;\
172.19.26.242:11212;172.19.26.244:11213/'
```

Implement a caching decorator

```
from django.core.cache import cache
def cache_for(seconds,fetch=0):
    def cache_it(func):
        def deco_func(self):
            val = cache.get(self.get_cache_key(fetch))
            if not val:
                val = func(self)
                cache.set(self.get_cache_key(fetch), val
            return val
        return deco_func
    return cache_it
```

Apply on the blocks

```
class TwitterBlock(TwitterSearchBlock):

    template_name = 'content_block_app/twitter_user_bloc
    ajax_template = "content_block_app/tweets_user.html"

    @cache_for(60*60,fetch=1)
    def fetch_data(self):
        import bettertwitter
        tw = bettertwitter.Twitter(email='umoja_com',pas
        user_tweets = tw.statuses.user_timeline(screen_na
        return user_tweets,None
```

Different cache Backends

- Database
- File System
- Local Memory
- Dummy- For Development

One more thing...

Admin by models alone

Administracja stroną

Auth		
Grupy	Dodaj	Zmień
Użytkownicy	Dodaj	Zmień
Sites		
Strony	Dodaj	Zmień
Tasks		
Zadania	Dodaj	Zmień
News		
Słowa Kluczowe	Dodaj	Zmień
Wiadomości	Dodaj	Zmień
Myghtyboard		
Categories	Dodaj	Zmień
Forums	Dodaj	Zmień

Ostatnie akcje

Moje akcje

- LinuxMint 2.1
  News
- Nowe phpSolutions z punBB już jest
  News
- Python full text search engines
  News
- Nowe artykuły
  News
- Nowe artykuły
  News
- Python full text search engines
  News
- Nowe artykuły
  News
- users
  Group
- Zrób sobie Auroxa
  News
- Zrzut Tygodnia
  News

Admin Syntax

```
from django.contrib import admin
from models import Post, Comment

class PostAdmin(admin.ModelAdmin):
    list_display = ('title','datetime')

class CommentAdmin(admin.ModelAdmin):
    list_display = ('text',)

admin.site.register(Post, PostAdmin)
admin.site.register(Comment,CommentAdmin)
```

World Online administration
LJWorld.com, Lawrence.com, KUsports.com, 6News

Welcome, **Jacob**.
Change password / Logout

Home › Photos

Select photo to change

Add photo +

Go

2000 2001 2002 2003 2004
2005 2006

Photo	Caption	Creation date
	Deron Lovaas, National Resources Defense Council	April 25, 2006, 11:21 a.m.
	Ethan Nuss, KU senior and organizer of the "Powershift" energy security conference	April 25, 2006, 11:15 a.m.
	KU Environs president Emelia LaFortune	April 25, 2006, 11:13 a.m.

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By site:
All
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www2.kusports.com
www2.ljworld.com
www.6newslawrence.com
www.6productions.com
www.lawrence.com

By creation date:
Any date
Today
Past 7 days
This month
This year

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Welcome, Jacob.
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Home › Photos › Add photo

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Photo: Browse...

Caption:

Add an Entry

Sites:

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internal.ljworld.com
www2.kusports.com
www2.ljworld.com
www.6newslawrence.com
www.6productions.com
www.lawrence.com

Hold down "Control", or "Command" on a Mac, to select more than one.

Credit

Staff member: ---------

One-off photographer:

Credit:

Creation date: Date: Today

World Online administration
LJWorld.com, Lawrence.com, KUsports.com, 6News

Welcome, Jacob.
Change password / Logout

Home › Photos › Add photo

Add photo

Please correct the errors below.

This field is required.

Photo: Browse...

Caption:

Auto Validation

This field is required.

Sites:

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www.lawrence.com

Hold down "Control", or "Command" on a Mac, to select more than one.

Credit

Staff member: ---------