CS 683 Emerging Technologies
Fall Semester, 2006
Doc 6 Django Install, Models & Database
Sep 12, 2006

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References

http://www.djangoproject.com/documentation/

Django Tutorial part 1 http://www.djangoproject.com/documentation/tutorial1/

Model Reference, http://www.djangoproject.com/documentation/model_api/

Database API, http://www.djangoproject.com/documentation/db_api/

Reading

Django Tutorial parts 1-4, http://www.djangoproject.com/documentation/tutorial1/

Installing Django

http://www.djangoproject.com/documentation/install/

Python 2.3 or higher

Don't need Apache and mod_python

Need database

- Sqlite, Postgres, or MySql

Database driver

Use official Django version (0.95)

SQlite

Zero-configuration

No separate program to run

3.3.7 latest version

http://www.sqlite.org/
    info & downloads

pysqlite

http://initd.org/tracker/pysqlite

Python driver for Sqlite

2.3.2 latest version

Django & rohan

Django, SQlite & pysqlite installed on rohan

Running Django on rohan

python manage.py runserver 0.0.0.0:8765

0.0.0.0

Allows remote access to Django web server

8765

Pick some port number to use

Only one person can use a port at a time

1024 - 65535 available ports

http://rohan.sdsu.edu:8765/etc

Django Documentation

http://www.djangoproject.com/documentation/

Basic Parts

Models and Database access
Templates
Forms
URLs
Sessions
Authentication

Assumptions for Examples

Using exiting cs683 project

Django web server started using:

manage.py runserver

using port 8000

In cs683 project create polls app:

python manage.py startapp polls

Models and Database Access

Models

```
from django.db import models

class Poll(models.Model):
    question = models.CharField(maxlength=200)
    pub_date = models.DateTimeField('date published')

    def __str__(self):
        return self.question

    class Admin:
        pass

class Choice(models.Model):
    poll = models.ForeignKey(Poll)
    choice = models.CharField(maxlength=200)
    votes = models.IntegerField()

    def __str__(self):
        return self.choice

    class Admin:
        pass
```

Change in settings.py

```
INSTALLED_APPS = (
    'django.contrib.auth',
    'django.contrib.contenttypes',
    'django.contrib.sessions',
    'django.contrib.sites',
    'cs683.simpleExamples',
    'cs683.polls',
    'django.contrib.admin',
)
```

Generating some sql

```
>python manage.py sqlall polls
BEGIN;
CREATE TABLE "polls_poll" (
    "id" integer NOT NULL PRIMARY KEY,
    "question" varchar(200) NOT NULL,
    "pub_date" datetime NOT NULL
);
CREATE TABLE "polls_choice" (
    "id" integer NOT NULL PRIMARY KEY,
    "poll_id" integer NOT NULL REFERENCES "polls_poll" ("id"),
    "choice" varchar(200) NOT NULL,
    "votes" integer NOT NULL
);
CREATE INDEX polls_choice_poll_id ON "polls_choice" ("poll_id");
COMMIT;
```

Tables with some data

polls_poll

id	question	pub_date
1	Do you like Django Reinhardt's music?	2006-09-13 18:45
2	Do you like Python?	2006-09-14 11:22

polls_choice

id	poll_id	choice	votes
1	1	Yes	0
2	1	No	0
3	1	Who is Django Reinhardt?	0
4	2	Yes	0
5	2	No	0

Object Version

poll

question: Do you like Django Reinhardt's music?

pub_date: 2006-09-13 18:45

choices:

Yes
0

No
0

Who is Django Reinhardt?
0

Creating the tables

```
>python manage.py syncdb
Creating table polls_poll
Creating table polls_choice
Adding permission 'poll | Can add poll'
Adding permission 'poll | Can change poll'
Adding permission 'poll | Can delete poll'
Adding permission 'choice | Can add choice'
Adding permission 'choice | Can change choice'
Adding permission 'choice | Can delete choice'
```

Useful commands

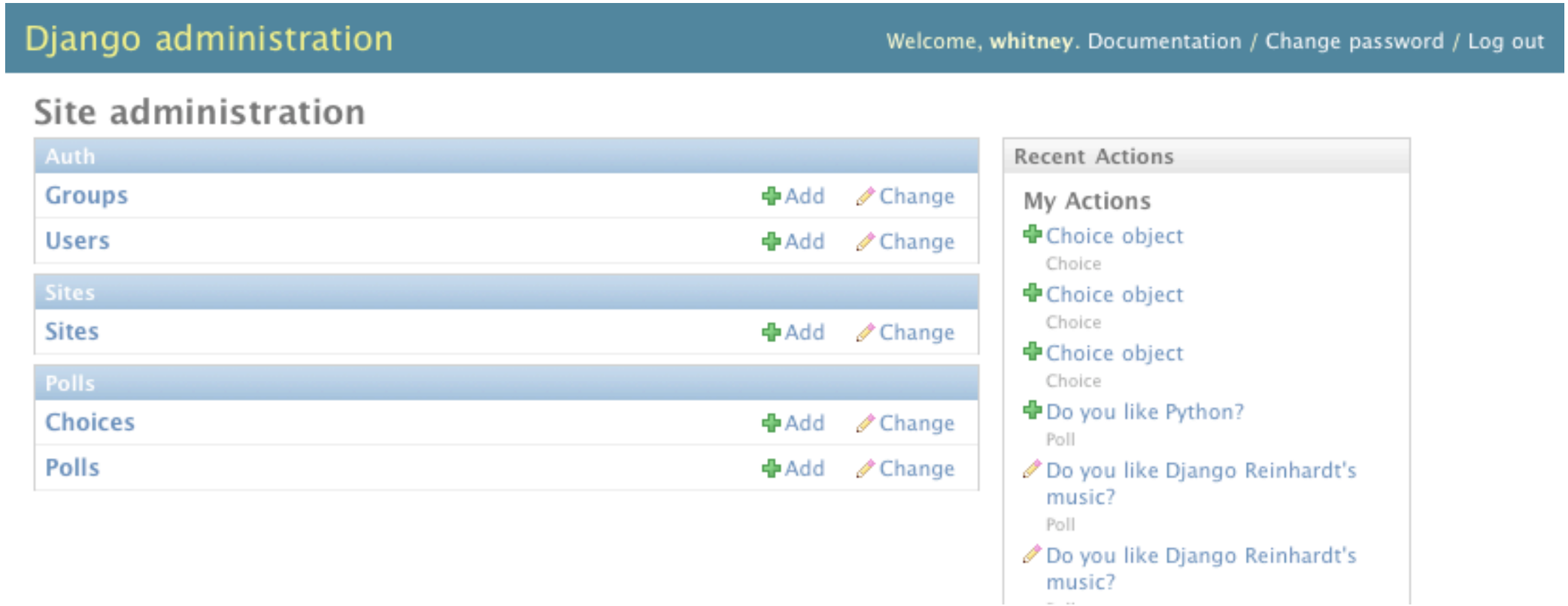
python manage.py

sql [appname appname ...]
sqlall [appname appname ...]
sqlclear [appname appname ...]
sqlindexes [appname appname ...]
sqlinitialdata [appname appname ...]
sqlreset [appname appname ...]
syncdb

http://www.djangoproject.com/documentation/django_admin/

Admin Pages

http://127.0.0.1:8000/admin/




```
class Choice(models.Model):
    ...
    class Admin:
        pass
```

```
class Poll(models.Model):
    ...
    class Admin:
        pass
```

Adding to Database

Django administration

Welcome, **whitney**. Documentation / Change password / Log out

Home › Choices › Add choice

Add choice

Poll: ---------

Choice:

Votes:

Save and add another | Save and continue editing | Save

Adding Models

If you add a new

- app
- model
- attribute to existing model

Update your database with:

```
python manage.py syncdb
```

Changing Existing Attributes

syncdb will not modify existing columns

Modify column by hand

use python manage.py reset appname to get SQL

Delete database and rebuild

Accessing SQLite Databases

sqlite3

- command-line tool
- part of SQLite distribution

Third party SQLite clients

- Google sqllite or sqlite manager

Initializing data

project/app/sql/modename.sql

cs683/polls/sql/poll.sql

```
INSERT INTO polls_poll (question, pub_date) VALUES ('What''s up doc?', '2006-09-14 13:00:00');
INSERT INTO polls_poll (question, pub_date) VALUES ('Where is the beef?', '2006-09-14 13:00:00');
```

syncdb will run project/app/sql/modename.sql files to initialize tables

shell access to database

```
>manage.py shell

Python 2.3.5 (#1, Mar 20 2005, 20:38:20)
[GCC 3.3 20030304 (Apple Computer, Inc. build 1809)] on darwin
Type "help", "copyright", "credits" or "license" for more information.
(InteractiveConsole)

>>> from cs683.polls.models import Poll, Choice

>>> Poll.objects.all();
[<Poll: Do you like Django Reinhardt's music?>, <Poll: Do you like
Python?>, <Poll: What's up doc?>]
>>>
```

Some Queries

```
>>> Poll.objects.all();
[<Poll: Do you like Django Reinhardt's music?>, <Poll: Do you like
Python?>, <Poll: What's up doc?>]

>>> Poll.objects.get(id=1)
<Poll: Do you like Django Reinhardt's music?>

>>> Poll.objects.count()
3

>>> Poll.objects.filter(question__contains='Django')
[<Poll: Do you like Django Reinhardt's music?>]

>>>Poll.objects.filter(pub_date__year=2006)
[<Poll: Do you like Django Reinhardt's music?>, <Poll: Do you like
Python?>]

>>>Poll.objects.all().order_by('pub_date')
[<Poll: Do you like Django Reinhardt's music?>, <Poll: Do you like
Python?>, <Poll: What's up doc?>]
```

QuerySets

```
>>> Poll.objects.get(id=1).__class__
<class 'cs683.polls.models.Poll'>

>>> Poll.objects.filter(question__contains='Django').__class__
<class 'django.db.models.query.QuerySet'>
```

http://code.djangoproject.com/browser/django/trunk/django/db/models/query.py

Following References

```
>>> a = Choice.objects.get(id=1)
>>> a.poll
<Poll: Do you like Django Reinhardt's music?>
>>> a.votes
0
>>> a.poll.question
"Do you like Django Reinhardt's music?"

>>> poll = Poll.objects.get(id=1)
>>> poll.choice_set.all()
[<Choice: Yes>, <Choice: No>, <Choice: Who is Django Reinhard?>]
```

Queries

Returns QuerySet

- filter(**kwargs)
- exclude(**kwargs)
- order_by(*fields)
- distinct()
- values(*fields)
- dates(field, kind, order='ASC')
- select_related()
- extra(select=None, where=None, params=None, tables=None)

Does not return QuerySet

- get(**kwargs)
- create(**kwargs)
- get_or_create(**kwargs)
- count()
- in_bulk(id_list)
- latest(field_name=None)

http://www.djangoproject.com/documentation/db_api/

Lazy Evaluation

```
>>> a = Choice.objects.get(id=1)
>>> a.poll
<Poll: Do you like Django Reinhardt's music?>
>>> a.votes
0

>>> a.poll.question    #requires database lookup
"Do you like Django Reinhardt's music?"

>>> a.poll.question    #uses cached value
```

Pre-fetching Related Data

```
>>> a = Choice.objects.select_related().get(id=1)

>>> a.poll          #no database access
<Poll: Do you like Django Reinhardt's music?>
```