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WEB TECHNOLOGIES AND SYSTEMS (DEGREE IN COMPUTER SCIENCE)

DJANGO WEB 2.0 TUTORIAL

STARTING A PROJECT…

```
django-admin.py startproject myrecommendations
cd myrecommendations
mkdir templates
```

In myrecommendations/settings.py

- Edit your database settings, for instance MySQL:

```
DATABASES = {
    'default': {
    'ENGINE': 'django.db.backends.mysql,
    'NAME': dbname',
    'USER': 'dbuser', 'PASSWORD': 'dbpassword',
```

- And register the templates folder:

```
import os.path
TEMPLATE_DIRS = (
        os.path.join(os.path.dirname(__file__), '../templates'),
)
```

Create MySQL database and user:

```
$ mysql -u root -p
mysql> CREATE DATABASE dbname CHARACTER SET utf8;
mysql> GRANT ALL ON dbname.* TO 'dbuser'@'localhost' IDENTIFIED BY 'dbpassword';
```

Finally, let Django take control of the database:

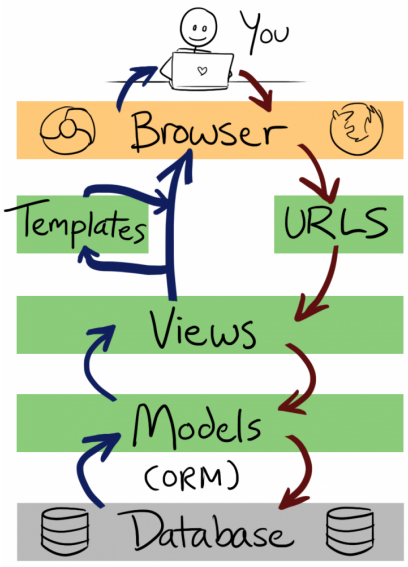
```
python manage.py syncdb
```

CREATING AN APPLICATION…

```
python manage.py startapp myrestaurants
```

Add 'myrestaurants', to INSTALLED_APPS list in myrecommendations/settings.py

OVERVIEW



CREATE YOUR DATA MODEL

```
from django.db import models
from django.contrib.auth.models import User
from django.core.urlresolvers import reverse
from datetime import date

class Restaurant(models.Model):
    name = models.TextField()
    street = models.TextField(blank=True, null=True)
    number = models.IntegerField(blank=True, null=True)
    city = models.TextField(default="")
    zipCode = models.TextField(blank=True, null=True)
    stateOrProvince = models.TextField(blank=True, null=True)
    country = models.TextField(blank=True, null=True)
    telephone = models.TextField(blank=True, null=True)
    url = models.URLField(blank=True, null=True)
    user = models.ForeignKey(User, default=User.objects.get(id=1))
    date = models.DateField(default=date.today)

    def __unicode__(self):
        return u"%s" % self.name
    def get_absolute_url(self):
        return reverse('myrestaurants:restaurant_detail', kwargs={'pk': self.pk})

class Dish(models.Model):
    name = models.TextField()
    description = models.TextField(blank=True, null=True)
    price = models.DecimalField('Euro amount', max_digits=8, decimal_places=2, blank=True,
        null=True)
    user = models.ForeignKey(User, default=User.objects.get(id=1))
    date = models.DateField(default=date.today)
    restaurant = models.ForeignKey(Restaurant, null=True)

    def __unicode__(self):
        return u"%s" % self.name
    def get_absolute_url(self):
        return reverse('myrestaurants:dish_detail',
            kwargs={'pkr': self.restaurant.pk, 'pk': self.pk})

class Review(models.Model):
    RATING_CHOICES = ((1, 'one'), (2, 'two'), (3, 'three'), (4, 'four'), (5, 'five'))
    rating = models.PositiveSmallIntegerField('Rating (stars)', blank=False, default=3,
        choices=RATING_CHOICES)
    comment = models.TextField(blank=True, null=True)
    user = models.ForeignKey(User, default=User.objects.get(id=1))
    date = models.DateField(default=date.today)

    class Meta:
        abstract = True

class RestaurantReview(Review):
    restaurant = models.ForeignKey(Restaurant)
```

Validate your model and commit to database:

```
python manage.py validate
python manage.py syncdb
```

Optionally register your model with the administrative interface (if you have the admin enabled under INSTALLED_APPS in settings.py), so you get a CRUD UI for free in '<URL>/admin':

In myrecommendations/settings.py uncomment in the list of installed applications:

```
'django.contrib.admin',
```

In myrecommendations/urls.py uncomment:

```
from django.contrib
import admin admin.autodiscover()
…
url(r'^admin/', include(admin.site.urls)),
```

Finally, in admin.py in the myrestaurants directory...

```
import models
```

```
from django.contrib import admin

admin.site.register(models.Restaurant)
admin.site.register(models.Dish)
…
```

DESIGN YOUR URLS

In the project root directory, edit myrecommendations/urls.py:

```
(r'^myrestaurants/', include('myrestaurants.urls', namespace='myrestaurants')),
```

In the myrestaurants application directory create urls.py:

```
from django.conf.urls import patterns, url
from django.utils import timezone
from django.views.generic import DetailView, ListView, UpdateView
from models import Restaurant, Dish
from forms import RestaurantForm, DishForm
from views import RestaurantCreate, DishCreate, RestaurantDetail

urlpatterns = patterns('',
    # List latest 15 restaurants: /myrestaurants/
    url(r'^$',
        ListView.as_view(
            queryset=Restaurant.objects.filter(date__lte=timezone.now()).order_by('date')[:15],
            context_object_name='latest_restaurant_list',
            template_name='myrestaurants/restaurant_list.html'),
        name='restaurant_list'),

    # Restaurant details, ex.: /myrestaurants/restaurants/1/
    url(r'^restaurants/(?P<pk>\d+)/$',
        RestaurantDetail.as_view(),
        name='restaurant_detail'),

    # Restaurant dish details, ex: /myrestaurants/restaurants/1/dishes/1/
    url(r'^restaurants/(?P<pkr>\d+)/dishes/(?P<pk>\d+)/$',
        DetailView.as_view(
            model=Dish,
            template_name='myrestaurants/dish_detail.html'),
        name='dish_detail'),

    # Create a restaurant, /myrestaurants/restaurants/create/
    url(r'^restaurants/create/$',
        RestaurantCreate.as_view(),
        name='restaurant_create'),

    # Edit restaurant details, ex.: /myrestaurants/restaurants/1/edit/
    url(r'^restaurant/(?P<pk>\d+)/edit/$',
        UpdateView.as_view(
            model = Restaurant,
            template_name = 'myrestaurants/form.html',
            form_class = RestaurantForm),
        name='restaurant_edit'),

    # Create a restaurant dish, ex.: /myrestaurants/restaurants/1/dishes/create/
    url(r'^restaurants/(?P<pk>\d+)/dishes/create/$',
        DishCreate.as_view(),
        name='dish_create'),

    # Edit restaurant dish details, ex.: /myrestaurants/restaurants/1/dishes/1/edit/
    url(r'^restaurants/(?P<pkr>\d+)/dishes/(?P<pk>\d+)/edit/$',
        UpdateView.as_view(
            model = Dish,
            template_name = 'myrestaurants/form.html',
            form_class = DishForm),
        name='dish_edit'),

    # Create a restaurant review, ex.: /myrestaurants/restaurant/1/reviews/create/
    url(r'^restaurant/(?P<pk>\d+)/reviews/create/$',
        'myrestaurants.views.review',
        name='review_create'),
)
```

Custom Class Views

```
from django.core.urlresolvers import reverse
from django.http import HttpResponseRedirect
from django.shortcuts import get_object_or_404
from django.views.generic import DetailView
from django.views.generic.edit import CreateView
from models import RestaurantReview, Restaurant, Dish
from forms import RestaurantForm, DishForm

class RestaurantDetail(DetailView):
    model = Restaurant
    template_name = 'myrestaurants/restaurant_detail.html'

    def get_context_data(self, **kwargs):
        context = super(RestaurantDetail, self).get_context_data(**kwargs)
        context['RATING_CHOICES'] = RestaurantReview.RATING_CHOICES
        return context

class RestaurantCreate(CreateView):
    model = Restaurant
    template_name = 'myrestaurants/form.html'
    form_class = RestaurantForm

    def form_valid(self, form):
        form.instance.user = self.request.user
        return super(RestaurantCreate, self).form_valid(form)

class DishCreate(CreateView):
    model = Dish
    template_name = 'myrestaurants/form.html'
    form_class = DishForm

    def form_valid(self, form):
        form.instance.user = self.request.user
        form.instance.restaurant = Restaurant.objects.get(id=self.kwargs['pk'])
        return super(DishCreate, self).form_valid(form)

def review(request, pk):
    restaurant = get_object_or_404(Restaurant, pk=pk)
    review = RestaurantReview(
        rating=request.POST['rating'],
        comment=request.POST['comment'],
        user=request.user,
        restaurant=restaurant)
    review.save()
    return HttpResponseRedirect(reverse('myrestaurants:restaurant_detail',
        args=(restaurant.id,)))
```

Create your Application Templates

First, create a base template in myrestaurants/templates/myrestaurants

```
{% load staticfiles %}
<!DOCTYPE html>
<html lang="en">
<head>
    <link rel="stylesheet" href="{% static "style/base.css" %}" />
    <title>{% block title %}MyRestaurants by MyRecommentdations.org{% endblock %}</title>
</head>
<body>
<div id="header">
    {% block header %}
        {% if user.username %}<p>User {{ user.username }}</p>
        {% else %}<p><a href="/login/">Sign in</a></p>{% endif %}
    {% endblock %}
</div>
<div id="sidebar">
    {% block sidebar %}<ul><li><a href="/myrestaurants">Home</a></li></ul>{% endblock %}
</div>
<div id="content">
    {% block content %}
        {% if error_message %}<p><strong>{{ error_message }}</strong></p>{% endif %}
```

```
    {% endblock %}
</div>
<div id="footer">{% block footer %}{% endblock %}</div>
</body>
</html>
```

Next create *restaurant_list.html* in *myrestaurants/templates/myrestaurants*

```
{% extends "myrestaurants/base.html" %}
{% block content %}
<h1>
    Restaurants
    {% if user %}(<a href="{% url 'myrestaurants:restaurant_create' %}">add</a>){% endif %}
</h1>
<ul>
    {% for restaurant in latest_restaurant_list %}
        <li><a href="{% url 'myrestaurants:restaurant_detail' restaurant.id %}">
            {{ restaurant.name }}</a></li>
    {% empty %}<li>Sorry, no restaurants registered yet.</li>
    {% endfor %}
</ul>
{% endblock %}
```

Or *restaurant_detail.html*, which includes the list of dishes and the review form:

```
{% extends "myrestaurants/base.html" %}
{% block content %}
<h1>
    {{ restaurant.name }}
    {% if user == restaurant.user %}
        (<a href="{% url 'myrestaurants:restaurant_edit' restaurant.id %}">edit</a>)
    {% endif %}
</h1>
<h2>Address:</h2>
<p>
    {{ restaurant.street }}, {{ restaurant.number }} <br/>
    {{ restaurant.zipcode }} {{ restaurant.city }} <br/>
    {{ restaurant.stateOrProvince }} ({{ restaurant.country }})
</p>
<h2>
    Dishes
    {% if user %}
        (<a href="{% url 'myrestaurants:dish_create' restaurant.id %}">add</a>)
    {% endif %}
</h2>
<ul>
    {% for dish in restaurant.dish_set.all %}
        <li><a href="{% url 'myrestaurants:dish_detail' restaurant.id dish.id %}">
            {{ dish.name }}</a></li>
    {% empty %}<li>Sorry, no dishes for this restaurant yet.</li>
    {% endfor %}
</ul>
<h2>Reviews</h2>
<ul>
    {% for review in restaurant.restaurantreview_set.all %}
        <li>
            <p>{{ review.rating }} star{{ review.rating|pluralize }}</p>
            <p>{{ review.comment }}</p>
            <p>Created by {{ review.user }} on {{ review.date }}</p>
        </li>
    {% endfor %}
</ul>
<h3>Add Review</h3>
<form action="{% url 'myrestaurants:review_create' restaurant.id %}" method="post">
    {% csrf_token %}
    Message: <textarea name="comment" id="comment" rows="4"></textarea>
    <p>Rating:</p>
    <p>{% for rate in RATING_CHOICES %}
    <input type="radio" name="rating" id="rating{{ forloop.counter }}" value="{{ rate.1 }}" />
    <label for="choice{{ forloop.counter }}">{{ rate.1 }} star{{ rate.0|pluralize }}</label>
    <br/>{% endfor %}
    </p>
    <input type="submit" value="Review" />
</form>
```

```
{% endblock %}
{% block footer %}
    Created by {{ restaurant.user }} on {{ restaurant.date }}
{% endblock %}
```

CREATE FORMS

Finally, there are the forms in *forms.py* that are automatically created from the Restaurant and Dish models to create and edit them:

```
from django.forms import ModelForm
from models import Restaurant, Dish

class RestaurantForm(ModelForm):
    class Meta:
        model = Restaurant
        exclude = ('user', 'date',)

class DishForm(ModelForm):
    class Meta:
        model = Dish
        exclude = ('user', 'date', 'restaurant',)
```

And the template that shows them, *form.html*:

```
{% extends "myrestaurants/base.html" %}
{% block content %}
    <form method="post" action="">
        {% csrf_token %}
        <table>
            {{ form.as_table }}
        </table>
        <input type="submit" value="Submit"/>
    </form>
{% endblock %}
```

SCHEMA MIGRATION

Install the South application for schema migration

```
$> pip install south
```

At 'south' to the end of INSTALLED_APPS in myrecommendations/settings.py

Then, create the south database tables:

```
python manage.py syncdb
```

If your application tables already exist, enable the application so it can be migrated:

```
python manage.py convert_to_south myapp
```

If it is a new application, add it to INSTALLED_APPS and then:

```
python manage.py schemamigration myapp –initial
python migrate myapp
```

From this point on, after changing models.py, instead of "`python manage.py syncdb`", do:

```
python manage.py schemamigration myapp --auto
python migrate myapp
```