MIT
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Indonesia Summer 2013
Meetup 09 – Intro to Django

MISTI

Google

Today‘s Meetup

- The Big Picture
- Django – A Web Application Framework
- Your First Django App
- Models in Django
- Today‘s Assignment

The Big Picture

So far we have an Android Frontend…

What now?

We need to implement the backend:

- A web application framework, like
  - MonoRail, CppCMS, Apache Click, Grails, Spring, Stripes, multiple, Catalyst, CakePHP, Drupal, Symfony, CherryPy, Django, web2py, Ruby on Rails, Compujure
- A host, like
  - Heroku, Google App Engine

The Big Picture

Web App Host

Your Django app

Android OS

Your Android app

Django
Web Application Framework

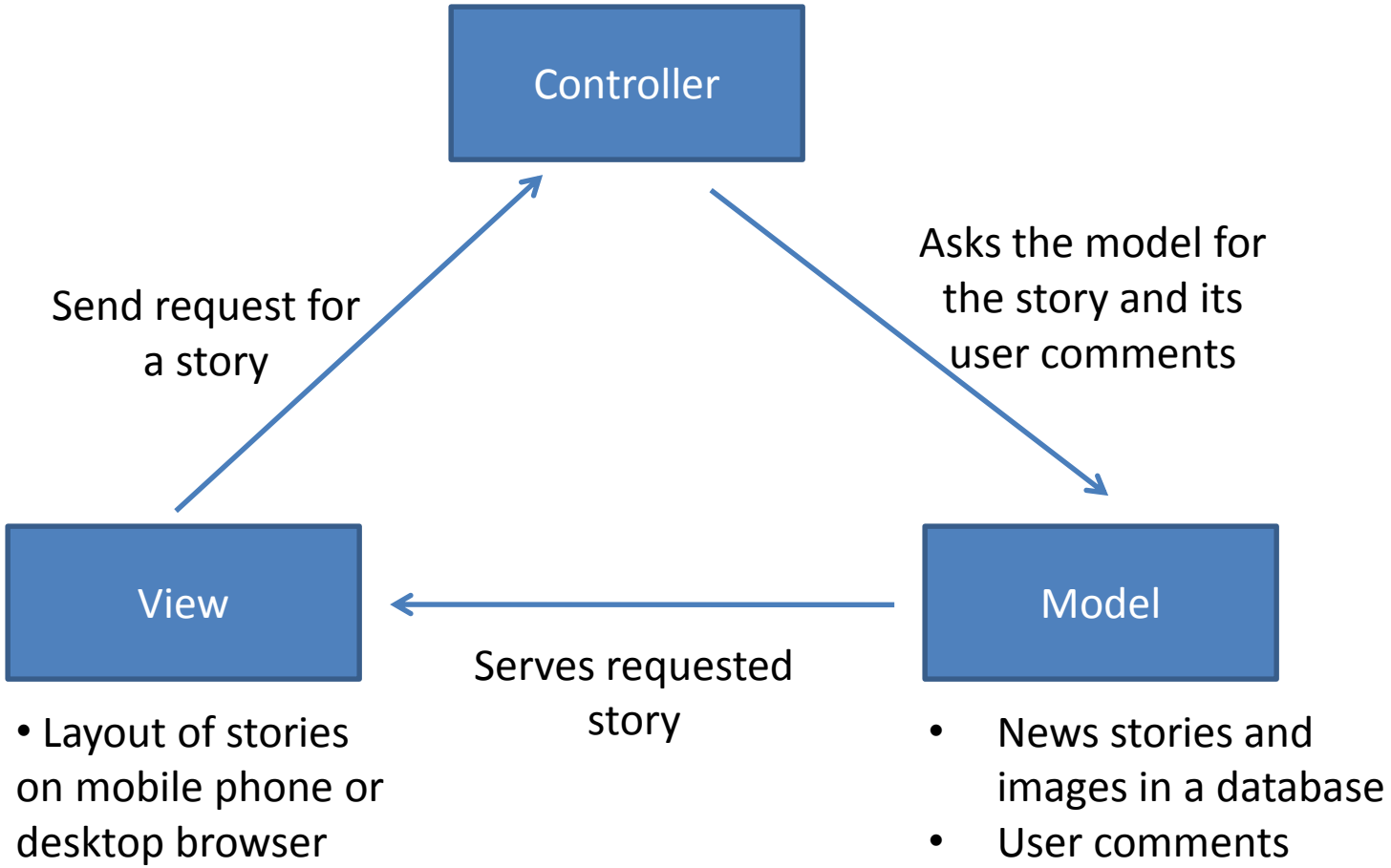
Web Application Framework

- A framework (code libraries) to help you make web applications or websites
- Supports you with
  - Handling HTTP requests
  - Templates for common HTML layouts
  - URL mapping
  - Database communication
  - Session management
  - Site security
- Allows you to focus on design and functionality rather than small details.

Model-View-Controller (MVC)

- A pattern for organizing code often seen in web app frameworks
- Main idea is
  1. Separate the storage and manipulation of data (the model) and the presentation of data (view)
  2. Use the Controller to communicate between the model and view
- Advantages
  - Easier to develop and test model and view independently
  - Easier for others to understand

Model-View-Controller (MVC) (news site example)



What is Django?

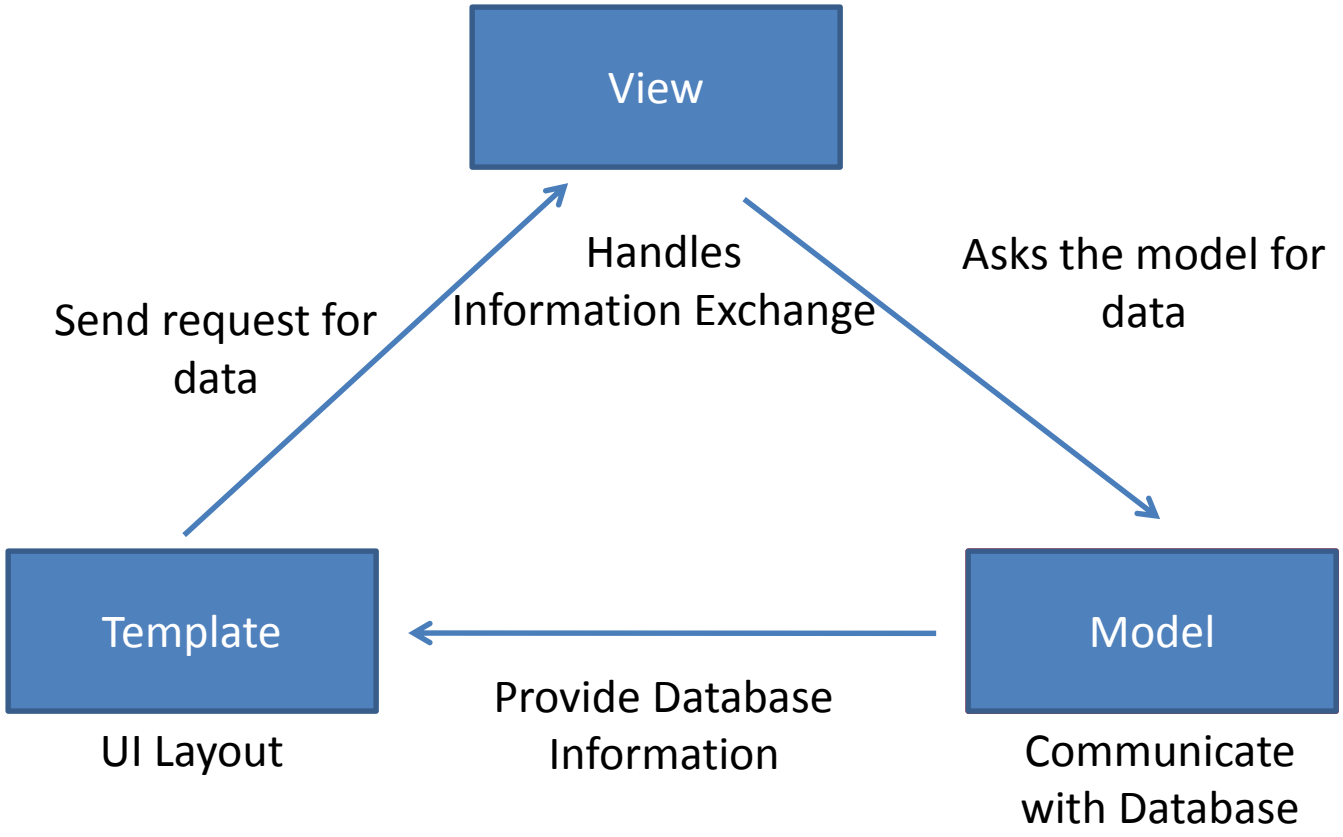
- Web application framework, written in Python
- Released 2005
- Began with World Online, that needed to rapidly develop applications for news sites.
- Named after gypsie jazz guitarist Django Reinhardt (1910-53)
- Uses the MVC pattern, but with a twist on philosophy

Model-Template-View

In Django: Model-Template-View
(similar to MVC pattern)

- Model
  - describes database information
- Template
  - decides how to present information
- View
  - manages what information to output based on request

Model-Template-View



Why Django?

- Fast and easy development of web applications
  - Modular and re-useable. Don't Repeat Yourself (DRY) principle
  - BuiltIn SQLite support
- Active development and wide community support
- Successful Django sites http://djangosites.org/
- Supported by Google App Engine & Heroku

Your First Django App

Installation

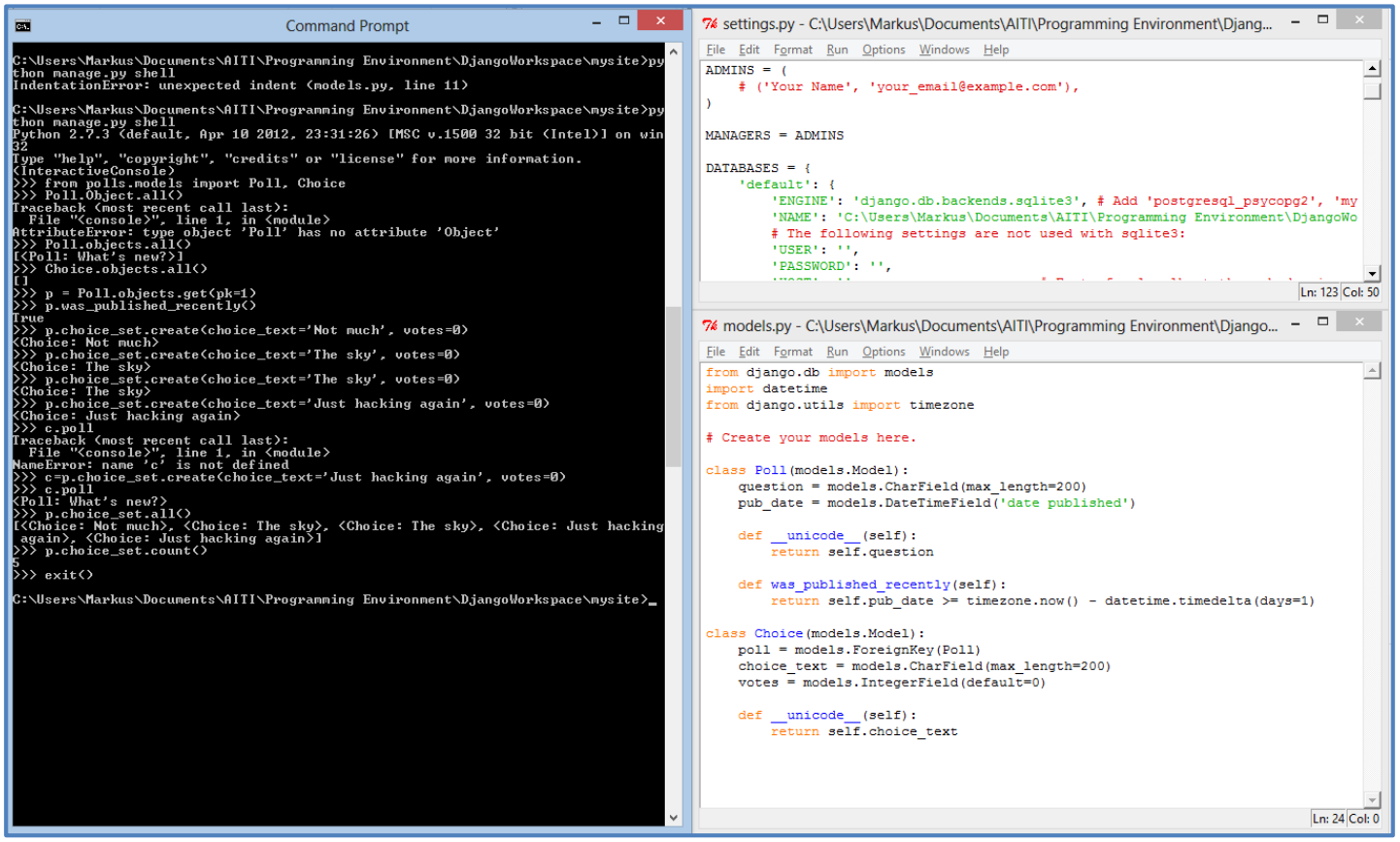
Follow the steps on:
https://docs.djangoproject.com/en/dev/topics/install/

- Skip Apache installation
  - For testing purposes built in webserver sufficient
- We will use SQLite as a database
  - No initial setup needed
- Install the official release Django 1.5.1
- Windows: Update your Path variable:
  - Add your Python directory
  - Add your django-admin.py directory

Programming Interface

Command Promt/ Console

Python IDLE



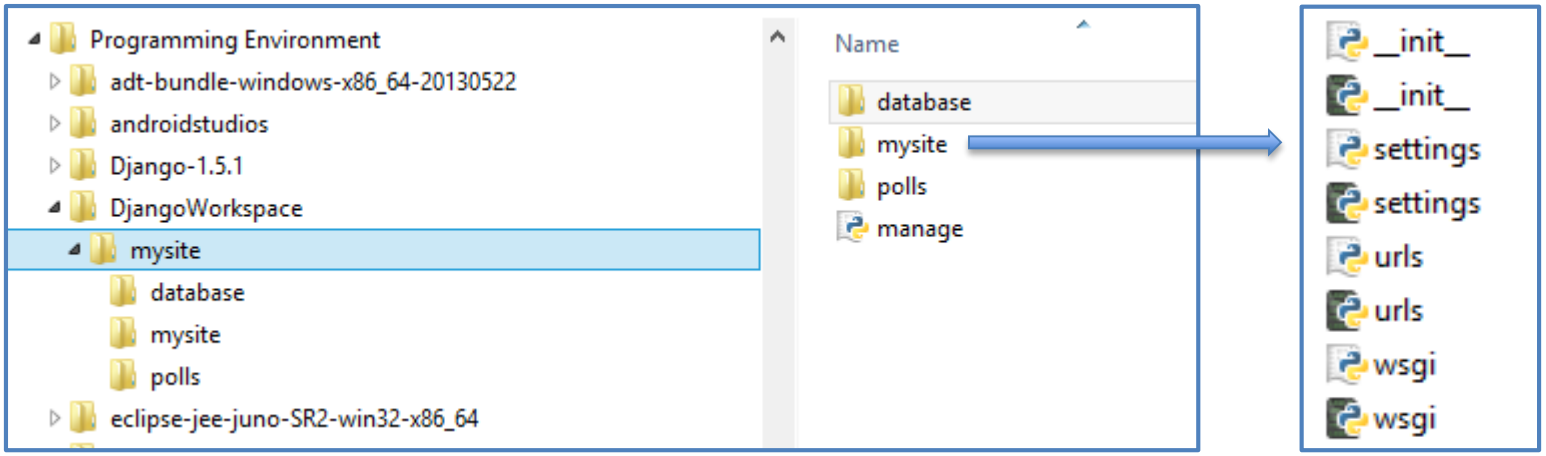
New Project

Project Structure:

Whole project in one folder (mysite)

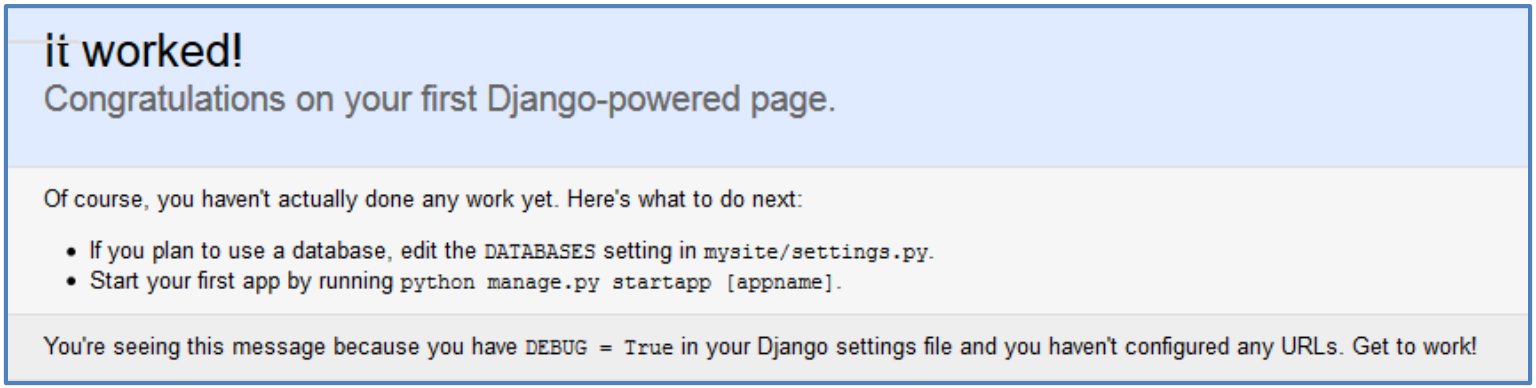
- MySite Python package
- Applications (polls)
- (Database)
- manage.py
  - Use for interaction with your project

- MySite Python Package
  - __init__.py
  - settings.py
  - urls.py
  - wsgi.py



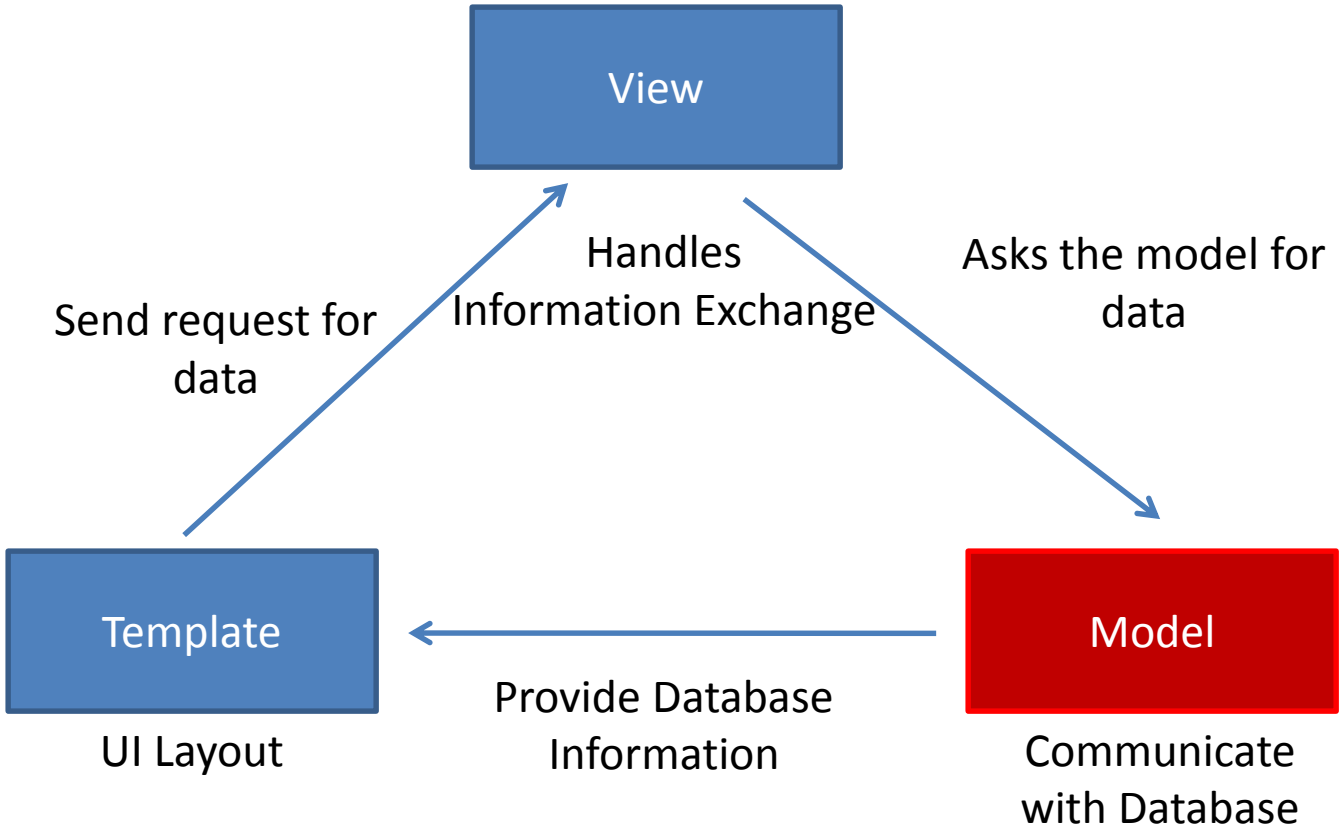
First Django Setup

Using the lightweight web server Django provides:



Models

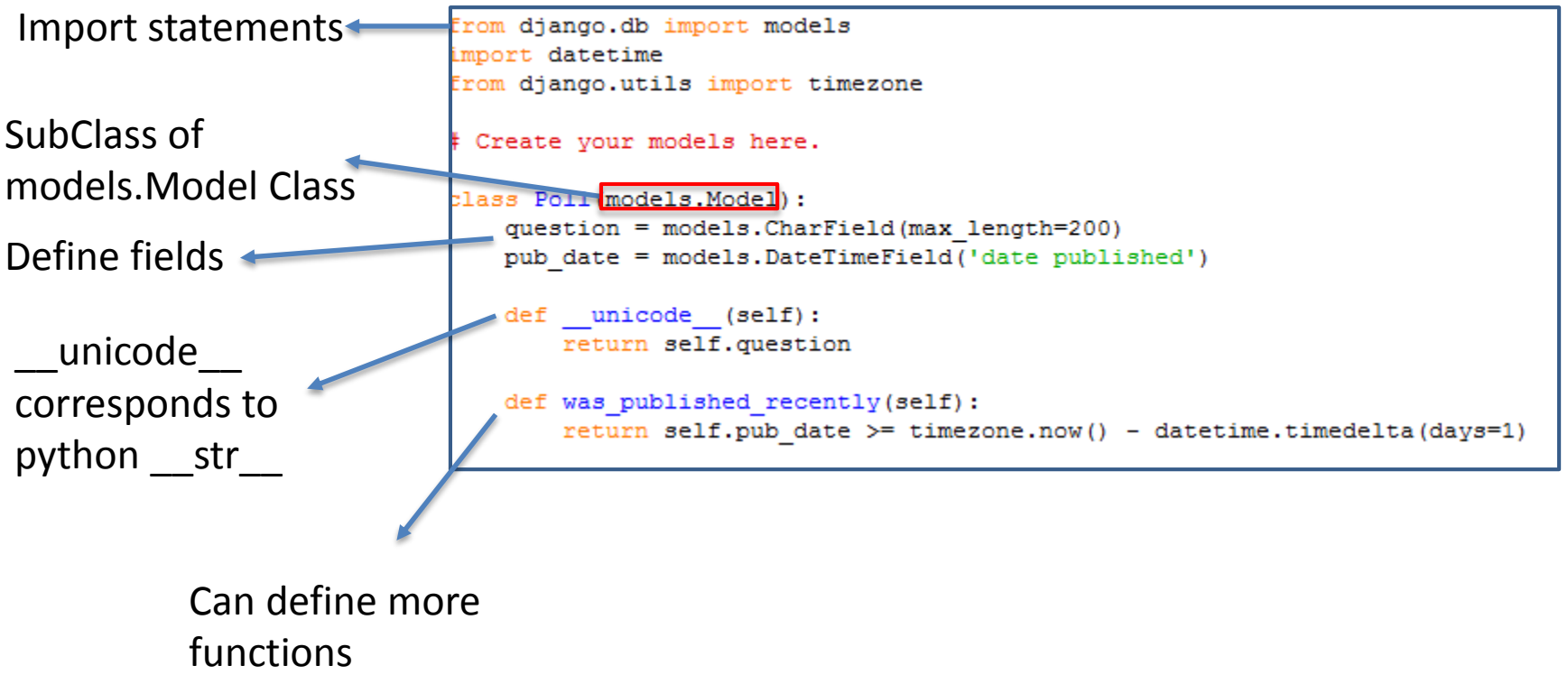
Models


View
Handles
Information Exchange
Send request for
data
Asks the model for
data
Template
UI Layout
Provide Database
Information
Model
Communicate
with Database

What is a Model

- A Python class describing data in your application
  - Subclass of models.Model
- Assigns attributes to each data field that is implemented
- Avoid direct work with the database
  - No need to handle database connections, timeouts, etc. Let Django do it for you.
  - Provides Schema for Database

Django Model Syntax



Django Fields

We can define fields directly in our model class

– No need to define manually in database

Example: create two fields in our Poll class

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

Define Type of Field

- E.g. models.CharField

Define arguments of field

- E.g. max_length=200

Django will automatically create fields in database

Important Django Field Types

- BooleanField
  - Checkbox
- CharField(max_length)
  - Single-line textbox
- DateField
  - Javascript calendar
- DateTimeField
  - Javascript calendar, time picker
- DecimalField(max_digits, decimal_places)
  - Decimal numbers
- EmailField
  - Charfield that validates email address
- FileField
  - File upload, stores path in database
- FloatField
  - Floating point numbers
- IntegerField
  Integer textbox
- PositiveIntegerField
  - Integer textbos for positive integers
- TextField
  - Multi-line textbox

Rules of Django Models

- When you update a model, ALWAYS RUN
  python manage.py syncdb
- All classes extend **models.Model**
- Models only live in **Apps**
- Django doesn't save objects until you call **save()** method

```
>>>a1 = Album(...)
# a1 is not saved to the database yet!
>>>a1.save()
# Now it is.
```

Today‘s Assignment

Today‘s Assignment

Get started with Django!

- Install Django 1.5.1 on your workstation
- Set up your Python Environment
  - Use SQLite as your Database
- Create your first Django app:
  Writing your first Django App – Part 1

Helpful Documentation:

- Chapters 1 - 3 of The Django Book