Introduction

Installation

Settings Module

Requests and Response

Running development server

Django admin site introduction

Installation

- Python Installation
- Django Installation

```
pip install django
```

Settings Module

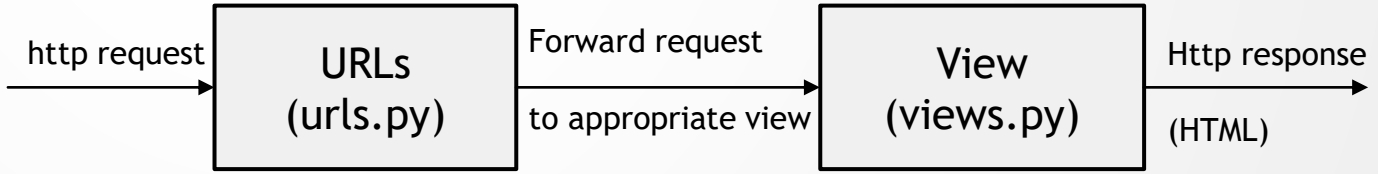
- settings.py – why these variables and values are used

Separating dev, prod, test environments

- Create a folder called settings or config
- Move the settings.py to that dir
- Create a __init__.py
- Create a dev.py, import settings to it, overwrite the values in dev.py
- Repeat the same for prod.py
- In settings.py, point the base dir one step up
- In wsgi.py and manage.py, point the settings to dev
- Run the server

Requests & Response

- When a url is striked in the web browser, ***urls.py*** is involved to map the path to a view (views.py)
- ***views.py*** is responsible to send a response HTML



Requests & Response

urls.py

```
from .views import index

urlpatterns = [
    path('admin/', admin.site.urls),
    path('', index),
]
```

views.py

```
from django.http import HttpResponse

def index(request):
    return HttpResponse('<b>Hello world<b>')
```

Running development server

- Make a new project directory
- Start the project

```
django-admin startproject mysite
```

- Run the server

```
python manage.py runserver
```

Django admin site introduction

- Apply / enable the default app(s) by migrate

```
python manage.py migrate
```

- Create a super user

```
python manage.py createsuperuser
```

- Run the server and play around admin site

```
python manage.py runserver
```

Template Layer

Overview of template language

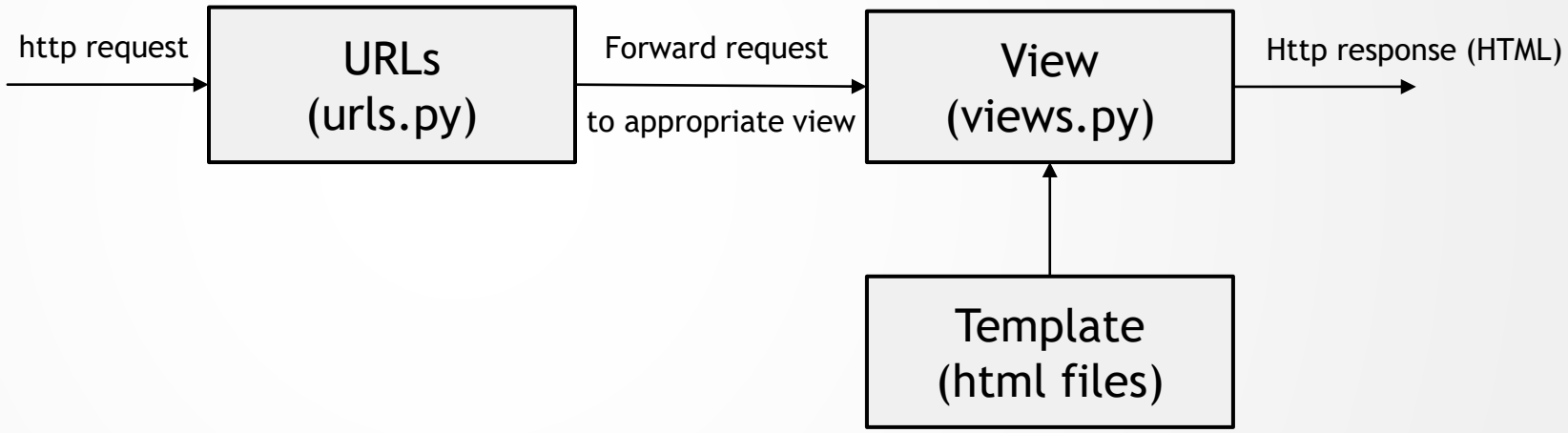
Built-in tags and filters

Humanization

custom tags and filters

csrf token

Overview of template language



Overview of template language

- Start an app

```
>python manage.py startapp members
```

- Add app to Installed Apps
- In project directory, in settings.py, add the newly created members

```
INSTALLED_APPS = [
    'django.contrib.admin',
    'django.contrib.auth',
    'django.contrib.contenttypes',
    'django.contrib.sessions',
    'django.contrib.messages',
    'django.contrib.staticfiles',
    'members'
]
```

Overview of template language

- In app directory, create a folder called **templates** →backend → index.html

- Edit index.html

index.html

```
<html >


<style>
body {
    background-color: lightblue;
}
</style>
<body>
     hey
</body>
```

Overview of template language

- Edit members/views.py

views.py

```
def url1(request):
        return render(request,
'backends/blog.html')
```

- Add path to to project's urls.py

urls.py

```
from members.views import page

urlpatterns = [
    path('admin/', admin.site.urls),
    path('members/', page)
]
```

Overview of template language

- Makemigrations

```
>python manage.py makemigrations
```

- Migrate

```
>python manage.py migrate
```

- Run server

```
>python manage.py runserver
```

Built-in tags and filters

- For
- If

- Block

{% block content %}

{% endblock %}

- Extends

{% extends ‘backend/base.html’ %}

Built-in tags and filters

- Passing context from views.py

views.py

```
from django.shortcuts import render

# Create your views here.

context = {'data’: [

{'name': 'jessie', 'department': 'IT', 'count': 1},
{'name': 'malini', 'department': 'Chem’}

]}

def page(request):
        return render(request, 'backend/index.html',
context)
```

Built-in tags and filters

- Using for and if

index.html

```
<h1> my app </h1>
<b> data is </b>

{{ data }}

<b> elements in data </b>

{% for student in data %}
{% if student.name == 'jessie' %}
{{ student.count }}
{% endif %}
{% endfor %}
```

Templates Built-in tags and filters

- Add
- Capfirst

Additional Reference - official doc

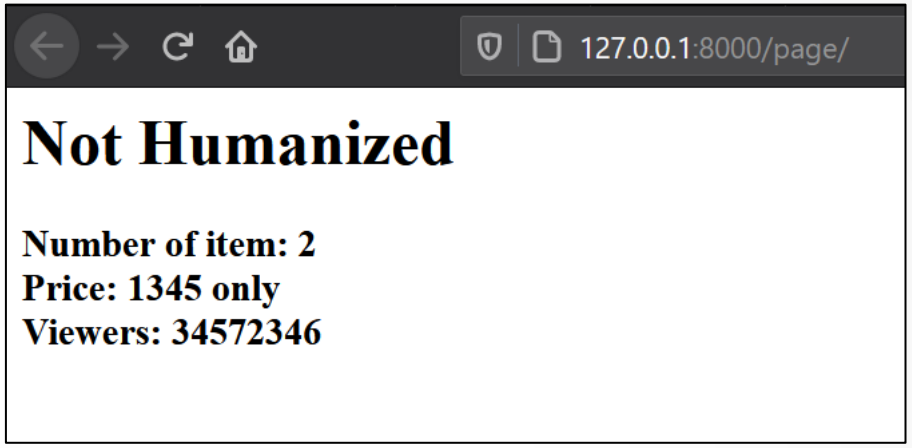
Templates Built-in tags and filters

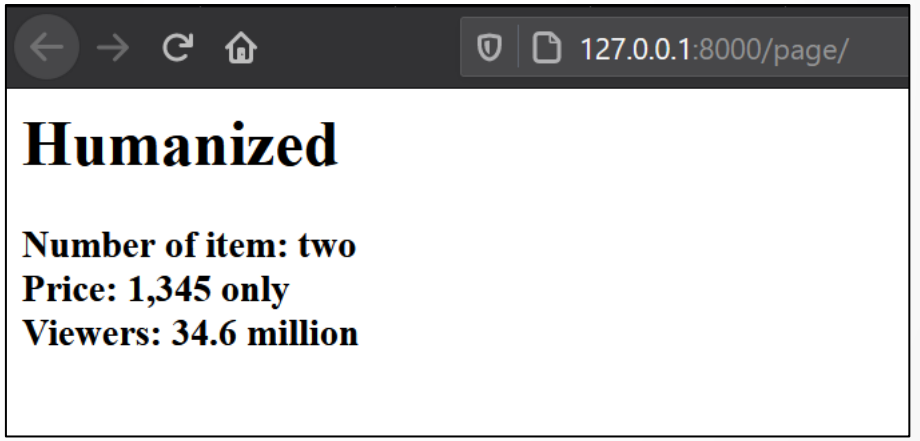
- Using add

index.html

```
<b> elements in data </b>

{% for student in data %}
{% if student.name == 'jessie' %}
{{ student.count|add:1 }}
{% endif %}
{% endfor %}
```

Humanization





Ref:
https://docs.djangoproject.com/en/3.1/ref/contrib/humanize/

Humanization

- In Installed apps add → ***django.contrib.humanize***
- Add context in *views.py*

views.py

```
from django.shortcuts import render

# Create your views here.
context = {
        'num_of_item': '2',
        'price': 1345,
        'viewers': 34572346
}

def page(request):
        return render(request,
'backend/index.html', context)
```

Humanization

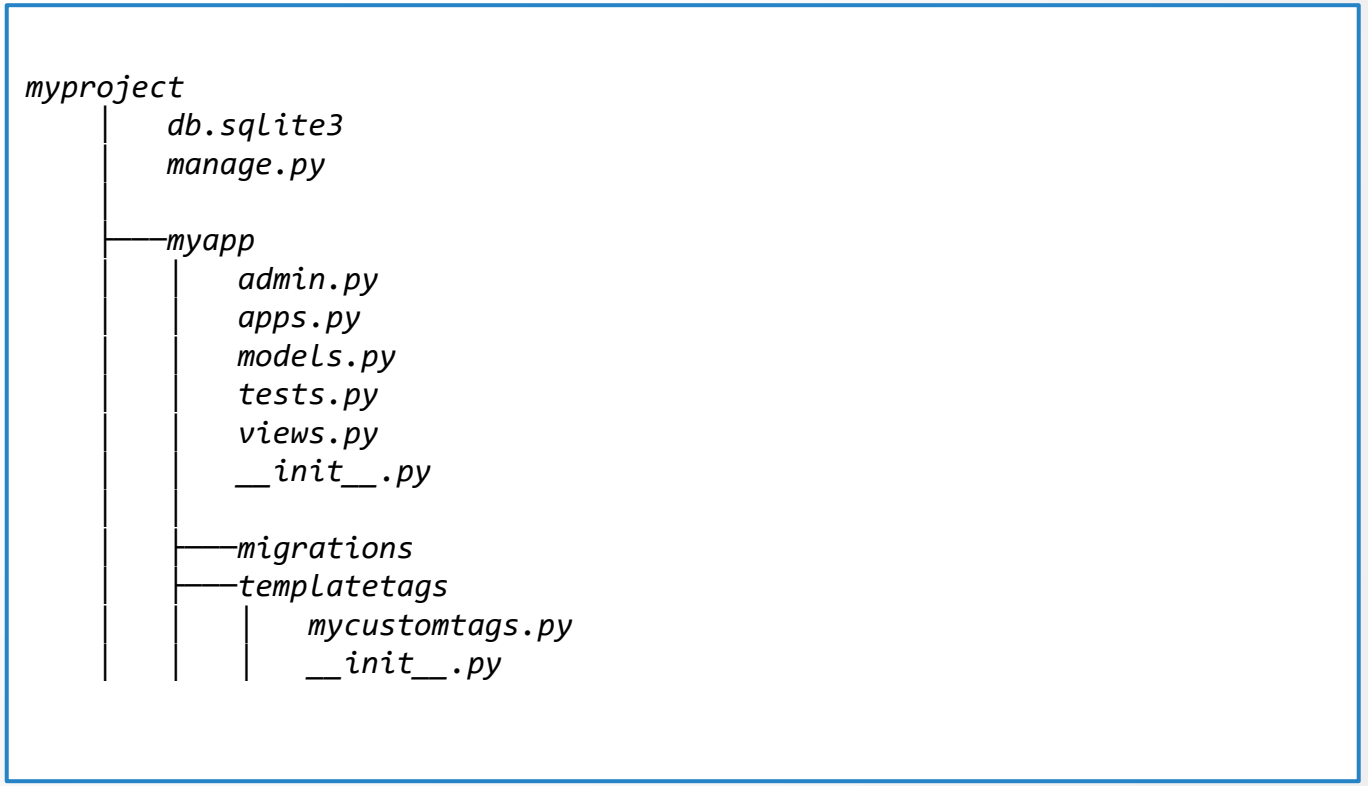
- Edit *index.html*

index.html

```
<h1> My Page </h1>

{% load humanize %}

<h3>
        Number of item:
        {{ num_of_item|apnumber }}
        </br>

        Price:
        {{ price|intcomma }} only
        </br>

        Viewers:
        {{ viewers|intword }}
        </br>

</h3>
```

custom tags and filters - Tags

- Create a directory called ***templatetags*** in app directory
- Create an empty ***__init__.py*** in templatetags to treate the directory as a python package
- Create any py file in templatetags, in this slide we are taking it as ***mycustomtags.py***



custom tags and filters - Tags

- Edit mycustomtags.py

mycustomtags.py

```
from django import template

register = template.Library()

@register.simple_tag
def count_list(lst):
        return len(lst)
```

- Add to *INSTALLED_APPS* → ***'myapp.templatetags.mycustomtags'***

custom tags and filters - Tags

- Context in *views.py*

views.py

```
context = {
        'data' : [1,2,3,4]
}
```

- In *index.html*

index.html

```
<h1> Custom Tags </h1>

{% load mycustomtags %}

{% count_list data %}
```

custom tags and filters - filters

- Create a new python file for a custom filter – example ***mycustomfilters.py***

mycustomfilters.py

```
from django import template


register = template.Library()


@register.filter
def cut(value, arg):
        return value.replace(arg, '')
```

- Add the custom filter to *INSTALLED_APPS* → ***'myapp.templatetags.mycustomfilters'***

custom tags and filters

-

filters

- Make sure you have a string value in *context* in *views.py*

views.py

```
context = {
        'data' : [1,2,3,4],
        'name' : 'malini'
}
```

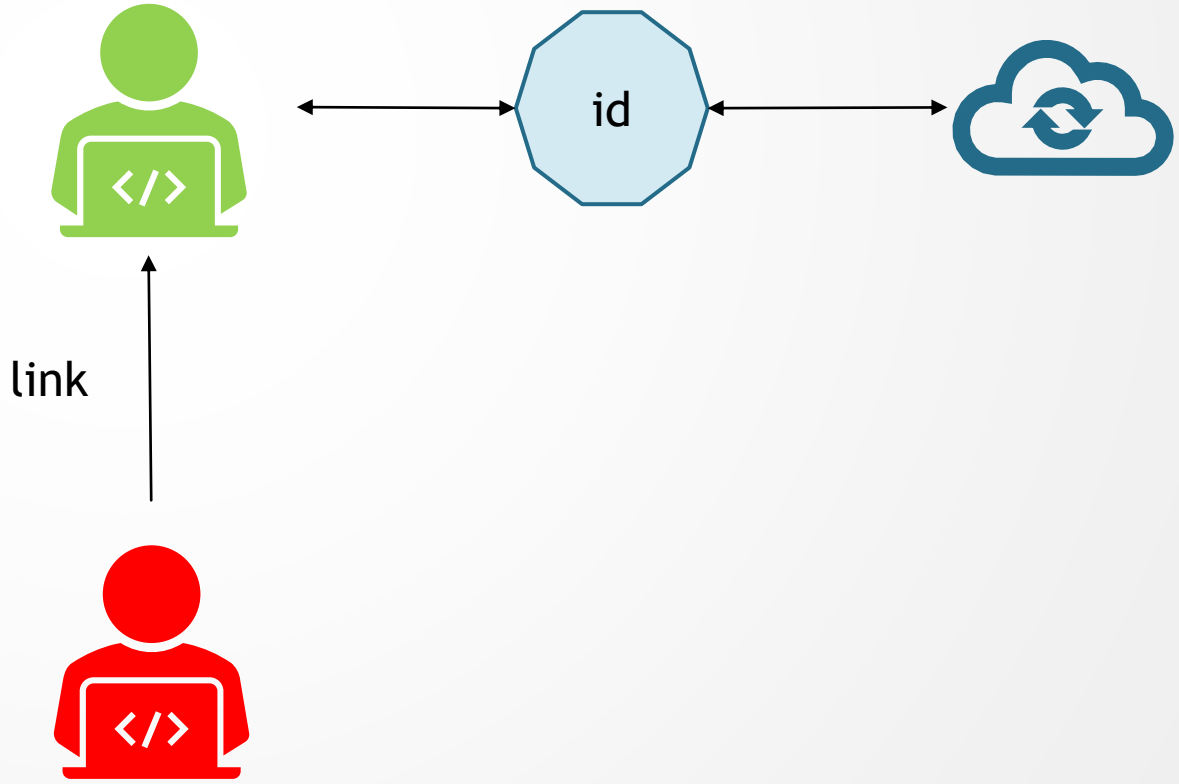
- In *index.html*

index.html

```
<h1> Custom Filters </h1>

{% load mycustomfilters %}

{{ name|cut:'a' }}
```

Csrf token

- Csrf – Cross site request forgery
- To know what's csrf – https://www.youtube.com/watch?v=hW2ONyxAySY



View Layer

View functions
URL confs
Shortcuts and decorators
Request and response objects
File upload
Class based views
Mixins
Generating csv and pdf

View functions

- In project directory, in ***views.py***

views.py

```
from django.http import HttpResponse


def page(request):
    html = "<html><body>Hello there !
</body></html>"
    return HttpResponse(html)
```

URL confs

- In project directory, in *settings.py*, ***ROOT_URLCONF*** where Django sees the urls patterns

- In app directory, create a new py file to store the app urls. Example: ***myappurls.py***

myappurls.py

```
from django.urls import path

from .views import page

urlpatterns = [
    path('page/', page),
]
```

URL confs

- In project directory, ***urls.py***

urls.py

```
from django.urls import path, include

urlpatterns = [
    path('admin/', admin.site.urls),
    path('', include('myapp.myappurls'))
]
```

- Try editing project dir settings.py urlconf
- Undo ! 😋

Shortcuts and decorators

Shortcuts

- render()
- redirect()
- get_object_or_404()
- get_list_or_404()

Official Doc Ref:
https://docs.djangoproject.com/en/3.1/topics/http/shortcuts/

Shortcuts and decorators

- Using redirect
- In app dir, *views.py*

views.py

```
from django.shortcuts import render, redirect

def page2(request):
        return redirect('../page/')
```

- In *urls.py*

urls.py

```
from .views import page, page2

urlpatterns = [
    path('page/', page),
    path('page2/', page2)
]
```

Shortcuts and decorators

Decorators

django.views.decorators.http

- require_http_methods(request_method_list)
- require_GET()
- require_POST()
- require_safe()

Official Doc Ref:
https://docs.djangoproject.com/en/3.1/topics/http/decorators/

Shortcuts and decorators

Decorators

- Normally a view function would use get method
- Try to restrict it to only POST method using *require_POST()*
- You should get *Method Not Allowed* error

views.py

```
from django.views.decorators.http import
require_POST

@require_POST
def page(request):
        return HttpResponse('<h1> Hello </h1>')
```

Request and response objects

Request Objects

- HttpRequest.scheme
- HttpRequest.path
- HttpRequest.method
- HttpRequest.is_secure()
- HttpRequest.user >> *request.user.is_authenticated*

More:
https://docs.djangoproject.com/en/3.1/ref/request-response/

Request and response objects

- Few request and response objects

views.py

```
def page(request):

        userauth = request.user.is_authenticated
        secure_flag = request.is_secure()
        curr_path = request.path
        method_used = request.method

        html_content = '''
        <html>
        <body>
        user authenticated: {} </br>
        connection uses https: {} </br>
        current url path: {} </br>
        method used: {} </br>
        </body>
        </html>
        '''.format(userauth, secure_flag, curr_path,
method_used)


        return HttpResponse(html_content)
```

user

- Exercises

login.html

```
<form>

userid: <input type="text" name="userid" > <br>

password: <input type="password" name="passcode">
<br>

<input type="submit" value="Submit">

</form>
```

- The default method is get
- Hence values are passed through url, which is not desirable

*http://127.0.0.1:8000/page/?**userid=trainer1&passcode=f8wiemzKEE28rcR***

Adding POST method

login.html

```
<form method="POST">
```

user

Forbidden (403)

CSRF verification failed. Request aborted.

Help

Reason given for failure:

```
CSRF token missing or incorrect.
```

In general, this can occur when there is a genuine Cross Site Request Forgery, or when Django's CSRF mechanism has not beer

- Your browser is accepting cookies.
- The view function passes a `request` to the template's `render` method.
- In the template, there is a `{% csrf_token %}` template tag inside each POST form that targets an internal URL.
- If you are not using `CsrfViewMiddleware`, then you must use `csrf_protect` on any views that use the `csrf_token` te
- The form has a valid CSRF token. After logging in in another browser tab or hitting the back button after a login, you ma login.

You're seeing the help section of this page because you have `DEBUG = True` in your Django settings file. Change that to `False`,

You can customize this page using the CSRF_FAILURE_VIEW setting.

user

- Add csrf_token inside form element

login.html

```
<form method="POST">
{% csrf_token %}
```

- How to access this data ?

views.py

```
def page(request):

        if request.method == 'POST':
                print(request.POST)

        return render(request, 'login.html')
```

In cmd <QueryDict: {'csrfmiddlewaretoken': ['********'], 'userid': ['trainer1'], 'passcode': ['*********']}>

user

- In the admin page create a user, in this example *trainer1*

views.py

```
from django.contrib.auth import authenticate

        if request.method == 'POST':
                userid = request.POST.get('userid')
                passcode = request.POST.get('passcode')

                user = authenticate(request,
username=userid, password=passcode)

                print(user)
```

- in cmd it would return userid

user

- If valid user, login

views.py

```
from django.contrib.auth import authenticate, login, logout


def page(request):


        if request.method == 'POST':
                userid = request.POST.get('userid')
                passcode = request.POST.get('passcode')


                print('$$$$$$$$$')
                print(request.user.is_authenticated)

                user = authenticate(request, username=userid,
password=passcode)
                if user is not None:
                        login(request, user)
                        print('$$$$$$$$$')
                        print(request.user.is_authenticated)

                        logout(request)
```

- Printing a welcome screen

user

views.py

```
from django.contrib.auth import authenticate, login, logout


def page(request):

…
                    if user is not None:
                                    login(request, user)
                                    content = {'userid': user}

                                    return render(request, 'home.html',
content)


        return render(request, 'login.html')
```

- Printing a welcome screen

home.html

```
<html>

Welcome {{ userid }}

</html>
```

user

Forms

Introduction

Forms API

Validating forms

Built-in fields, built-in widgets

Model form

Form sets

Models Layer

Model Introduction

Field types and customization

Making queries

Accessing related objects

Django migrations

Raw sql, search

Model Introduction

- In app dir, in *models.py*

models.py

```
from django.db import models

# Create your models here.
class member(models.Model):
        first_name = models.CharField(max_length=30)
        last_name = models.CharField(max_length=30)
```

Model Introduction

- Check the sqlite3 DB to see whether a new table with columns got created

myproj>C:\Users\Downloads\sqlite-tools-win32-x86-3340000\sqlite-tools-win32-x86-3340000\sqlite3.exe db.sqlite3

```
sqlite> .tables
auth_group                  django_admin_log
auth_group_permissions      django_content_type
auth_permission             django_migrations
auth_user                   django_session
auth_user_groups            myapp_member
auth_user_user_permissions
sqlite> pragma table_info(myapp_member);
0|id|integer|1||1
1|first_name|varchar(30)|1||0
2|last_name|varchar(30)|1||0
sqlite>
```

Field types

- In app dir, in *models.py*

models.py

```
from django.db import models

# Create your models here.
class member(models.Model):
        first_name = models.CharField(max_length=30)
        last_name = models.CharField(max_length=30)

        packages = (
                ('a', 'annual'),
                ('h', 'half_yearly'),
                ('q', 'quaterly')
                )

        packages =
models.CharField(blank=True,max_length=1, choices=packages)
```

Field types

- Check the sqlite3 DB to see whether a new column got created

```
myproj>C:\Users\Downloads\sqlite-tools-win32-x86-3340000\sqlite-tools-win32-x86-3340000\sqlite3.exe db.sqlite3
```

```
sqlite> pragma table_info(myapp_member);
0|id|integer|1||1
1|first_name|varchar(30)|1||0
2|last_name|varchar(30)|1||0
3|packages|varchar(1)|1||0
sqlite>
```

Field types

- In app dir, in *models.py*

models.py

```
from django.db import models

# Create your models here.
class member(models.Model):
        first_name = models.CharField(max_length=30)
        last_name = models.CharField(max_length=30)
        updated_dt = models.DateTimeField(auto_now=True)

        packages = (
                ('a', 'annual'),
                ('h', 'half_yearly'),
                ('q', 'quaterly')
                )

        packages =
models.CharField(blank=True,max_length=1, choices=packages)
        def __str__(self):
                return self.first_name
```

Field types

- Check the sqlite3 DB to see whether a new column got created

myproj>C:\Users\Downloads\sqlite-tools-win32-x86-3340000\sqlite-tools-win32-x86-3340000\sqlite3.exe db.sqlite3

```
sqlite> pragma table_info(myapp_member);
0|id|integer|1||1
1|first_name|varchar(30)|1||0
2|last_name|varchar(30)|1||0
3|packages|varchar(1)|1||0
4|updated_dt|datetime|1||0
```

- **More:** https://docs.djangoproject.com/en/3.1/ref/models/fields/

Making queries

- Open shell

```
myproj>python manage.py shell
```

```
(InteractiveConsole)
>>> from myapp.models import member
>>>
>>> b = member(first_name="jessy", last_name="tvm")
>>> b.save()
>>>
```

- Output

```
sqlite> select * from myapp_member;
1|hep |||2021-02-07 21:05:20.147456
4|hep |||2021-02-07 21:15:02.733587
5|jessy|tvm||2021-02-07 21:22:15.489916
```

Making queries

- Retrieving objects

```
>>> member.objects.all()[4].first_name
'jessy'
>>> member.objects.all()[3].first_name
'hep '
```

- Filter objects

```
>>> member.objects.all().filter(first_name__exact = 'jessy')
<QuerySet [<member: jessy>]>
```

- Try __gt, __lt, __contains, __startswith, __endswith
- More: https://docs.djangoproject.com/en/3.1/topics/db/queries/

To cover

- Inclusion tag – on completion of models
- Csrf – after forms or post get methods
- Views decorators – after get post methods