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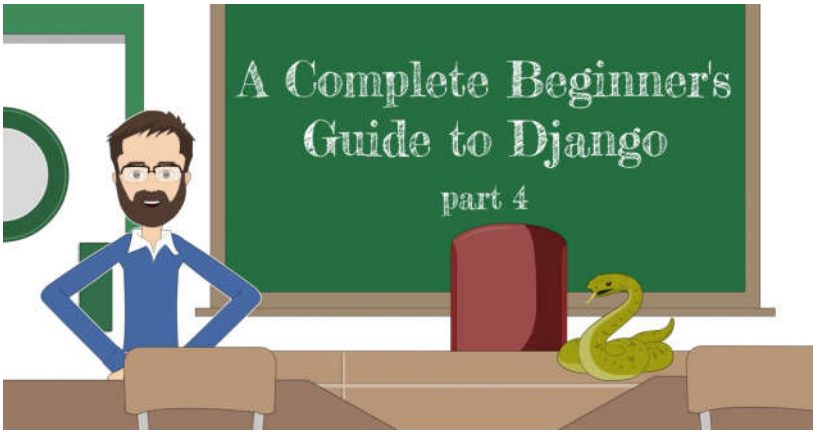
SERIES

A Complete Beginner's Guide to Django - Part 4

Sep 25, 2017 73 minutes read 146 comments 68,504 views Part 4 of 7



Mac Windows Linux Series 4/7 python 3.6.2 django 1.11.4

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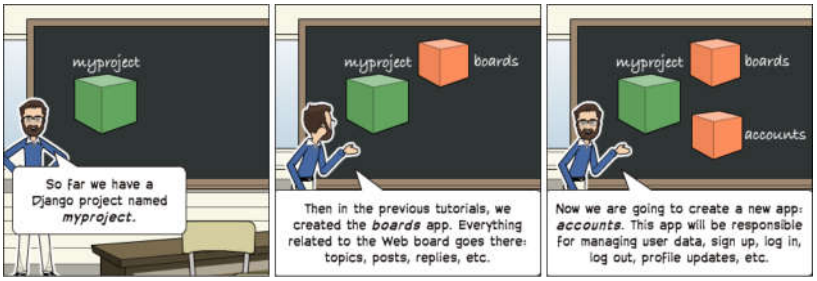
Introduction

password reset, and password change.

You are also going to get a brief introduction on how to protect some views from non-authorized users and how to access the information of the logged in user.

In the next section, you will find a few wireframes of authentication-related pages that we are going to implement in this tutorial. After that, you will find an initial setup of a new Django app. So far we have been working on an app named **boards**. But all the authentication related stuff can live in a different app, so to achieve a better organization of the code.



Wireframes

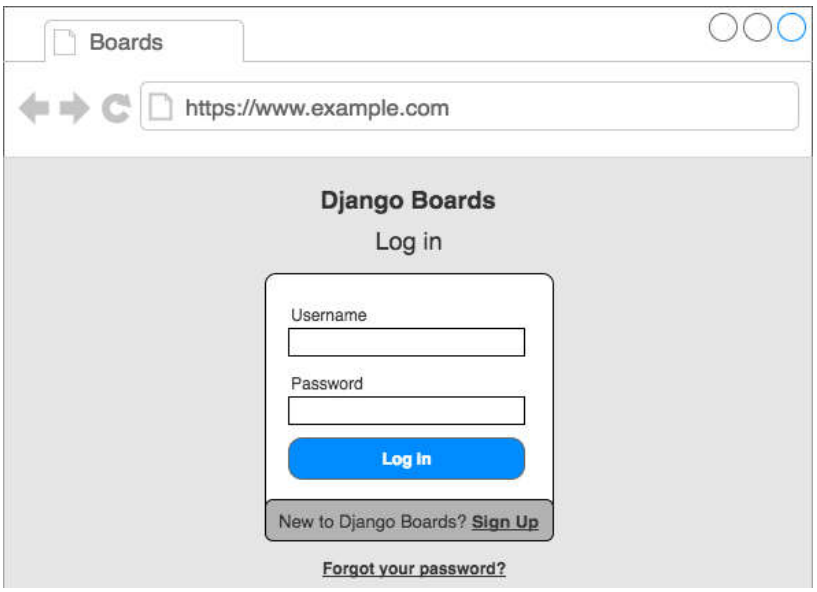
We have to update the wireframes of the application. First, we are going to add new options for the top menu. If the user is not authenticated, we should have two buttons: sign up and log in.

Figure 1: Top menu for not authenticated users.

If the user is authenticated, we should instead display their names along with a dropdown menu with three options: my account, change password and log out.

Figure 2: Top menu for authenticated users.

On the log in page, we need a form with **username** and **password**, a button with the main action (log in) and two alternative paths: sign up page and password reset page.



On the sign up page, we should have a form with four fields: **username**, **email address**, **password**, and **password confirmation**. The user should also be able to reach the log in page.

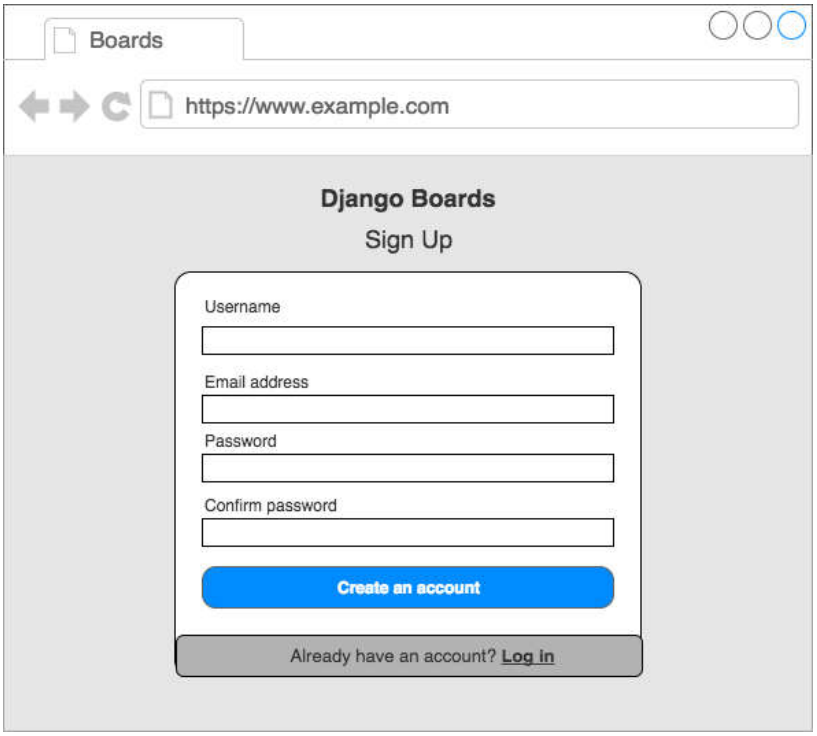
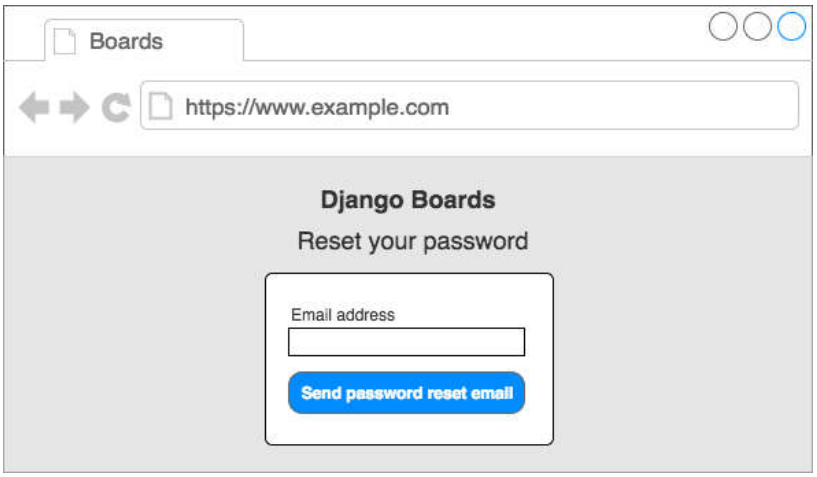


Figure 4: Sign up page

On the password reset page, we will have a form with just the **email address**.



set a new password:

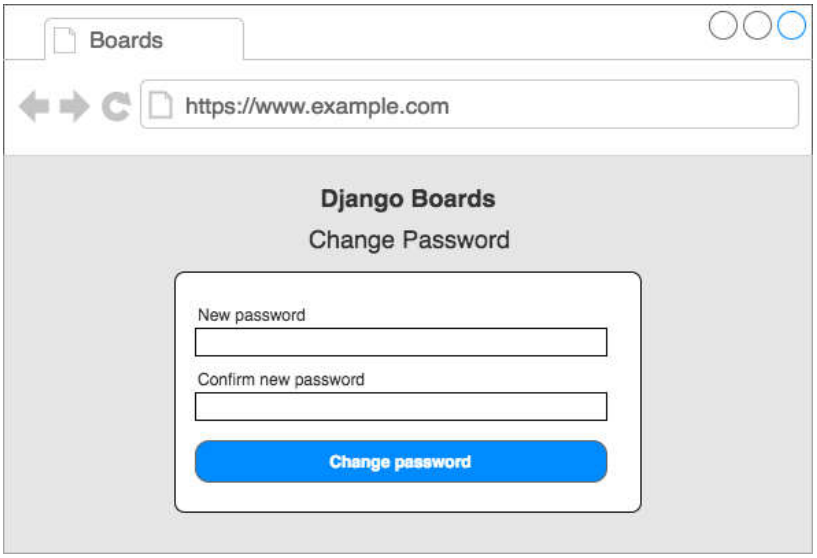


Figure 6: Change password

Initial Setup

To manage all this information, we can break it down in a different app. In the project root, in the same page where the **manage.py** script is, run the following command to start a new app:

```
django-admin startapp accounts
```

The project structure should like this right now:

```
myproject/
 |-- myproject/
 |     |-- accounts/      <-- our new
 |     |-- boards/
 |     |-- myproject/
```

```
+-- venv/
```

Next step, include the **accounts** app to the `INSTALLED_APPS` in the **settings.py** file:

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

    'widget_tweaks',

    'accounts',
    'boards',
]
```

From now on, we will be working on the **accounts** app.

Sign Up

Let's start by creating the sign up view. First thing, create a new route in the **urls.py** file:

myproject/urls.py

```
from boards import views

urlpatterns = [
    url(r'^$', views.home, name='home
    url(r'^signup/$', accounts_views
    url(r'^boards/(?P<pk>\d+)/$', vie
    url(r'^boards/(?P<pk>\d+)/new/$'
    url(r'^admin/', admin.site.urls)
]
```

Notice how we are importing the **views** module from the **accounts** app in a different way:

```
from accounts import views as accoun
```

We are giving an alias because otherwise, it would clash with the **boards'** views. We can improve the **urls.py** design later on. But for now, let's focus on the authentication features.

Now edit the **views.py** inside the **accounts** app and create a new view named **signup**:

accounts/views.py

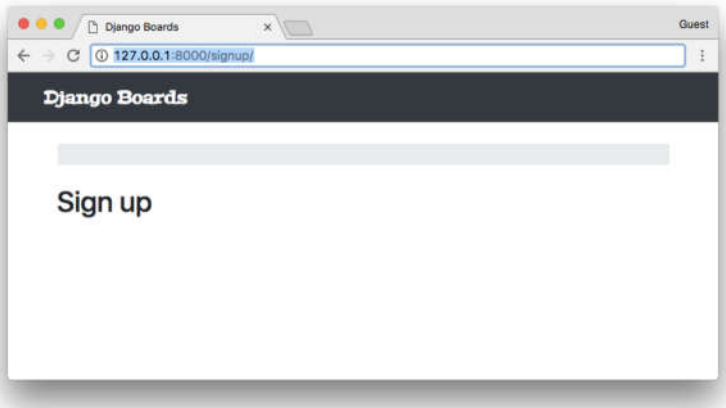
```
from django.shortcuts import render

def signup(request):
    return render(request, 'signup.h
```

Create the new template, named **signup.html**:

templates/signup.html

```
{% endblock %}
```

Open the URL **http://127.0.0.1:8000/signup/** in the browser, check if everything is working:



Time to write some tests:

accounts/tests.py

```
from django.core.urlresolvers import
from django.urls import resolve
from django.test import TestCase
from .views import signup

class SignUpTests(TestCase):
    def test_signup_status_code(self
        url = reverse('signup')
        response = self.client.get(u
        self.assertEquals(response.s

    def test_signup_url_resolves_sig
        view = resolve('/signup/')
        self.assertEquals(view.func,
```

Testing the status code (200 = success) and if the

```
python manage.py test
```

```
Creating test database for alias 'de
System check identified no issues (0
..................
----------------------------------
Ran 18 tests in 0.652s

OK
Destroying test database for alias '
```

For the authentication views (sign up, log in, password reset, etc.) we won't use the top bar or the breadcrumb. We can still use the **base.html** template. It just needs some tweaks:

templates/base.html

```
{% load static %}<!DOCTYPE html>
<html>
  <head>
    <meta charset="utf-8">
    <title>{% block title %}Django B
    <link href="https://fonts.google
    <link rel="stylesheet" href="{% 
    <link rel="stylesheet" href="{% 
    {% block stylesheet %}{% endbloc
  </head>
  <body>
    {% block body %}  <!-- HERE -->
      <nav class="navbar navbar-expa
        <div class="container">
          <a class="navbar-brand" hr
        </div>
      </nav>
      <div class="container">
        <ol class="breadcrumb my-4">
```

```
        {% endblock %}
      </div>
    {% endblock body %}  <!-- AND HE
  </body>
</html>
```

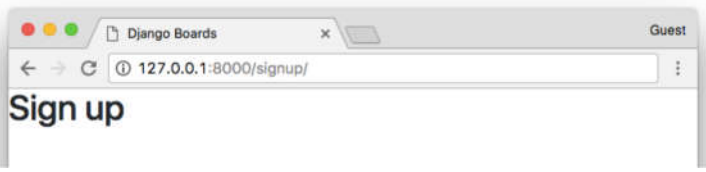
I marked with comments the new bits in the **base.html** template. The block `{% block stylesheet %}{% endblock %}` will be used to add extra CSS, specific to some pages.

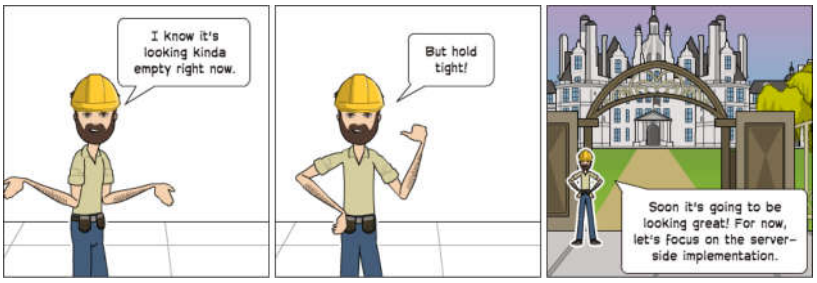
The block `{% block body %}` is wrapping the whole HTML document. We can use it to have an empty document taking advantage of the head of the **base.html**. Notice how we named the end block `{% endblock body %}`. In cases like this, it's a good practice to name the closing tag, so it's easier to identify where it ends.

Now on the **signup.html** template, instead of using the `{% block content %}`, we can use the `{% block body %}`.

templates/signup.html

```
{% extends 'base.html' %}

{% block body %}
  <h2>Sign up</h2>
{% endblock %}
```





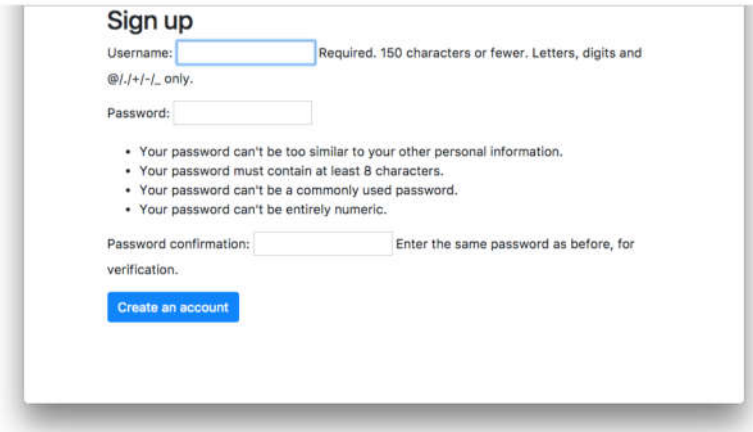
Time to create the sign up form. Django has a built-in form named **UserCreationForm**. Let's use it:

accounts/views.py

```
from django.contrib.auth.forms impor
from django.shortcuts import render

def signup(request):
    form = UserCreationForm()
    return render(request, 'signup.h
```

templates/signup.html

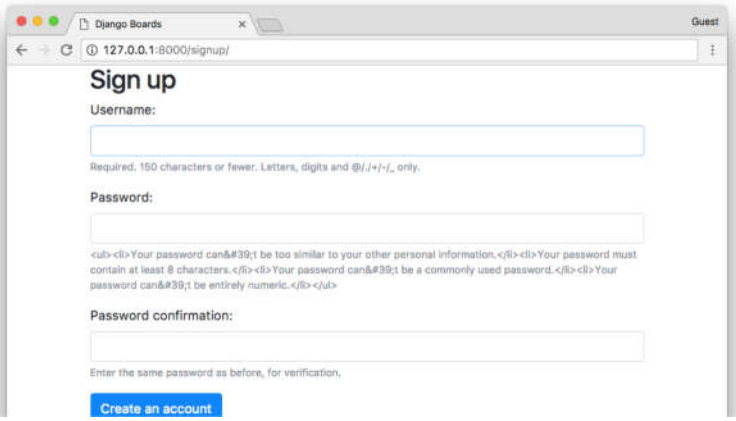
```
{% extends 'base.html' %}

{% block body %}
  <div class="container">
    <h2>Sign up</h2>
    <form method="post" novalidate>
      {% csrf_token %}
      {{ form.as_p }}
      <button type="submit" class="b
    </form>
  </div>
```



Looking a little bit messy, right? We can use our **form.html** template to make it look better:

templates/signup.html

```
{% extends 'base.html' %}

{% block body %}
  <div class="container">
    <h2>Sign up</h2>
    <form method="post" novalidate>
      {% csrf_token %}
      {% include 'includes/form.html
      <button type="submit" class="b
    </form>
  </div>
{% endblock %}
```



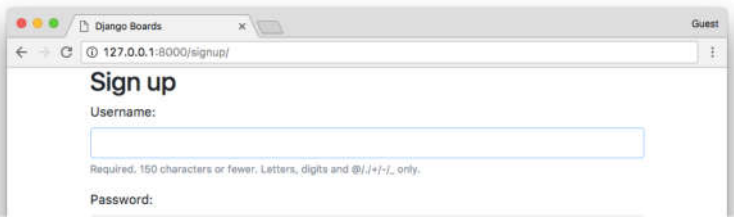
template is displaying some raw HTML. It's a security feature. By default Django treats all strings as unsafe, escaping all the special characters that may cause trouble. But in this case, we can trust it.

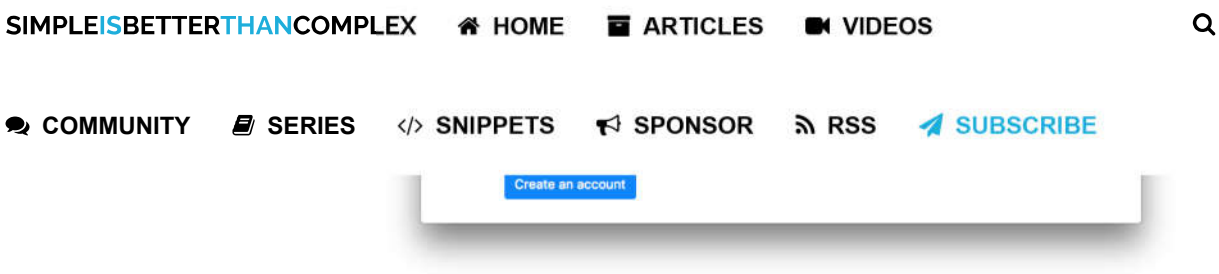
templates/includes/form.html

```
{% load widget_tweaks %}

{% for field in form %}
  <div class="form-group">
    {{ field.label_tag }}

    <!-- code suppressed for brevity

    {% if field.help_text %}
      <small class="form-text text-m
        {{ field.help_text|safe }}
      </small>
    {% endif %}
  </div>
{% endfor %}
```

Basically, in the previous template we added the option `safe` to the `field.help_text`: `{{ field.help_text|safe }}`.

Save the **form.html** file, and check the sign up page again:





Now let's implement the business logic in the **signup** view:

accounts/views.py

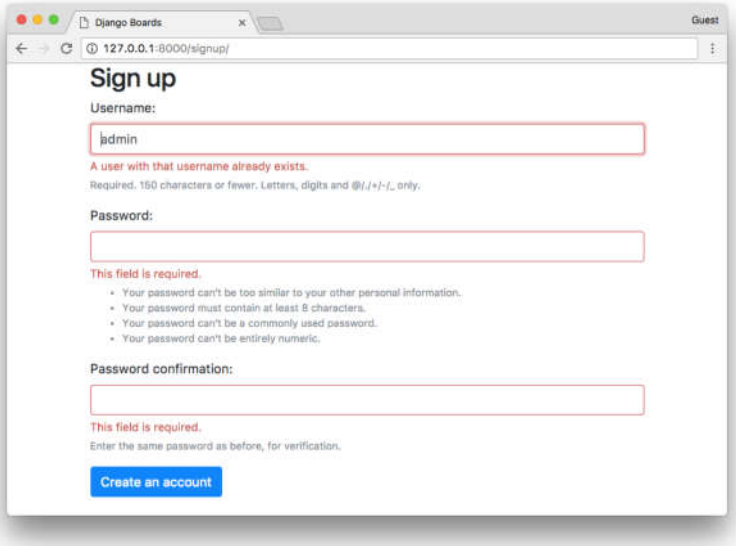
```
from django.contrib.auth import logi
from django.contrib.auth.forms impor
from django.shortcuts import render,

def signup(request):
    if request.method == 'POST':
        form = UserCreationForm(requ
        if form.is_valid():
            user = form.save()
            auth_login(request, user
            return redirect('home')
    else:
        form = UserCreationForm()
    return render(request, 'signup.h
```

A basic form processing with a small detail: the **login** function (renamed to **auth_login** to avoid clashing with the built-in login view).

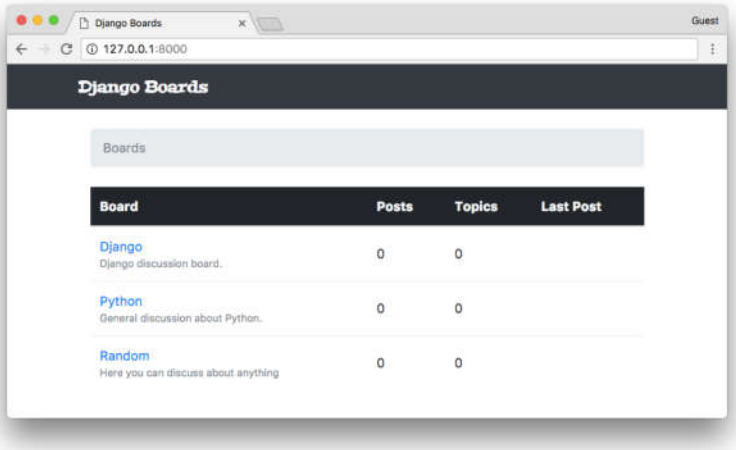
> **Note:** I renamed the `login` function to `auth_login`, but later I realized that Django 1.11 has a class-based view for the login view, `LoginView`, so there was no risk of clashing the names.
>
> On the older versions there was a `auth.login` and `auth.view.login`, which used to cause some confusion, because one was the function that logs the user in, and the other was the view.
>
> Long story short: you can import it just as `login` if you

the `user = form.save()`. The created user is then passed as an argument to the **auth_login** function, manually authenticating the user. After that, the view redirects the user to the homepage, keeping the flow of the application.

Let's try it. First, submit some invalid data. Either an empty form, non-matching fields, or an existing username:



Now fill the form and submit it, check if the user is created and redirected to the homepage:



How can we know if it worked? Well, we can edit the **base.html** template to add the name of the user on the top bar:

templates/base.html

```
{% block body %}
  <nav class="navbar navbar-expand-s
    <div class="container">
      <a class="navbar-brand" href="
      <button class="navbar-toggler"
        <span class="navbar-toggler-
      </button>
      <div class="collapse navbar-co
        <ul class="navbar-nav ml-aut
          <li class="nav-item">
            <a class="nav-link" href
          </li>
        </ul>
      </div>
    </div>
  </nav>

  <div class="container">
    <ol class="breadcrumb my-4">
      {% block breadcrumb %}
      {% endblock %}
    </ol>
    {% block content %}
    {% endblock %}
  </div>
{% endblock body %}
```

Testing the Sign Up View

Let's now improve our test cases:

accounts/tests.py

```
from django.contrib.auth.forms impor
from django.core.urlresolvers import
from django.urls import resolve
from django.test import TestCase
from .views import signup

class SignUpTests(TestCase):
    def setUp(self):
        url = reverse('signup')
        self.response = self.client.

    def test_signup_status_code(self
        self.assertEquals(self.respo

    def test_signup_url_resolves_sig
        view = resolve('/signup/')
        self.assertEquals(view.func,

    def test_csrf(self):
        self.assertContains(self.res

    def test_contains_form(self):
        form = self.response.context
        self.assertIsInstance(form, 
```

We changed a little bit the **SignUpTests** class. Defined a **setUp** method, moved the response object to there. Then now we are also testing if

Now we are going to test a successful sign up. This time, let's create a new class to organize better the tests:

accounts/tests.py

```
from django.contrib.auth.models impo
from django.contrib.auth.forms impor
from django.core.urlresolvers import
from django.urls import resolve
from django.test import TestCase
from .views import signup

class SignUpTests(TestCase):
    # code suppressed...

class SuccessfulSignUpTests(TestCase
    def setUp(self):
        url = reverse('signup')
        data = {
            'username': 'john',
            'password1': 'abcdef1234
            'password2': 'abcdef1234
        }
        self.response = self.client.
        self.home_url = reverse('hom

    def test_redirection(self):
        '''
        A valid form submission shou
        '''
        self.assertRedirects(self.re

    def test_user_creation(self):
        self.assertTrue(User.objects

    def test_user_authentication(sel
        '''
        Create a new request to an a
```

```
        user = response.context.get(
        self.assertTrue(user.is_auth
```

Run the tests.

Using a similar strategy, now let's create a new class for sign up tests when the data is invalid:

```
from django.contrib.auth.models impo
from django.contrib.auth.forms impor
from django.core.urlresolvers import
from django.urls import resolve
from django.test import TestCase
from .views import signup

class SignUpTests(TestCase):
    # code suppressed...

class SuccessfulSignUpTests(TestCase
    # code suppressed...

class InvalidSignUpTests(TestCase):
    def setUp(self):
        url = reverse('signup')
        self.response = self.client.

    def test_signup_status_code(self
        '''
        An invalid form submission s
        '''
        self.assertEquals(self.respo

    def test_form_errors(self):
        form = self.response.context
        self.assertTrue(form.errors)

    def test_dont_create_user(self):
        self.assertFalse(User.object
```

field is missing. Well, the **UserCreationForm** does not provide an **email** field. But we can extend it.

Create a file named **forms.py** inside the **accounts** folder:

accounts/forms.py

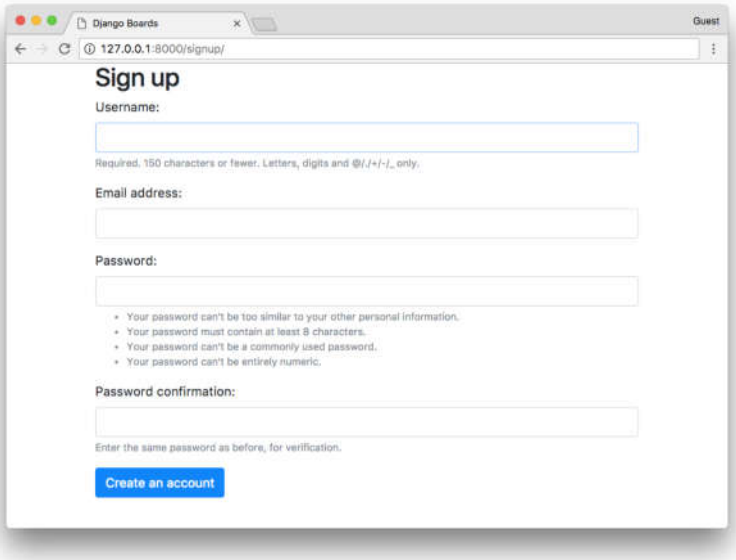
```
from django import forms
from django.contrib.auth.forms impor
from django.contrib.auth.models impo

class SignUpForm(UserCreationForm):
    email = forms.CharField(max_leng
    class Meta:
        model = User
        fields = ('username', 'email
```

Now, instead of using the **UserCreationForm** in our **views.py**, let's import the new form, **SignUpForm**, and use it instead:

accounts/views.py

```
from django.contrib.auth import logi
from django.shortcuts import render,

from .forms import SignUpForm

def signup(request):
    if request.method == 'POST':
        form = SignUpForm(request.PO
        if form.is_valid():
            user = form.save()
            auth_login(request, user
            return redirect('home')
```

Just with this small change, everything is already working:



Remember to change the test case to use the **SignUpForm** instead of **UserCreationForm**:

```
from .forms import SignUpForm

class SignUpTests(TestCase):
    # ...

    def test_contains_form(self):
        form = self.response.context
        self.assertIsInstance(form, 

class SuccessfulSignUpTests(TestCase
    def setUp(self):
        url = reverse('signup')
        data = {
            'username': 'john',
            'email': 'john@doe.com',
            'password1': 'abcdef1234
            'password2': 'abcdef1234
        }
```

The previous test case would still pass because since **SignUpForm** extends the **UserCreationForm**, *it is* an instance of **UserCreationForm**.

Now let's think about what happened for a moment. We added a new form field:

```
fields = ('username', 'email', 'pass
```

And it automatically reflected in the HTML template. It's good, right? Well, depends. What if in the future, a new developer wanted to re-use the **SignUpForm** for something else, and add some extra fields to it. Then those new fields would also show up in the **signup.html**, which may not be the desired behavior. This change could pass unnoticed, and we don't want any surprises.

So let's create a new test, that verifies the HTML inputs in the template:

accounts/tests.py

```
class SignUpTests(TestCase):
    # ...

    def test_form_inputs(self):
        '''
        The view must contain five i
        password1, password2
```

```
        self.assertContains(self.resp
```

Improving the Tests Layout

Alright, so we are testing the inputs and everything, but we still have to test the form itself. Instead of just keep adding tests to the **accounts/tests.py** file, let's improve the project design a little bit.

Create a new folder named **tests** within the **accounts** folder. Then, inside the **tests** folder, create an empty file named **__init__.py**.

Now, move the **tests.py** file to inside the **tests** folder, and rename it to **test_view_signup.py**.

The final result should be the following:

```
myproject/
 |-- myproject/
 |     |-- accounts/
 |     |     |-- migrations/
 |     |     |-- tests/
 |     |     |     |-- __init__.py
 |     |     |     +-- test_view_signup
 |     |     |-- __init__.py
 |     |     |-- admin.py
 |     |     |-- apps.py
 |     |     |-- models.py
 |     |     +-- views.py
 |     |-- boards/
 |     |-- myproject/
 |     |-- static/
 |     |-- templates/
 |     |-- db.sqlite3
```

the context of the apps, we need to fix the imports in the new **test_view_signup.py**:

accounts/tests/test_view_signup.py

```
from django.contrib.auth.models impo
from django.core.urlresolvers import
from django.urls import resolve
from django.test import TestCase

from ..views import signup
from ..forms import SignUpForm
```

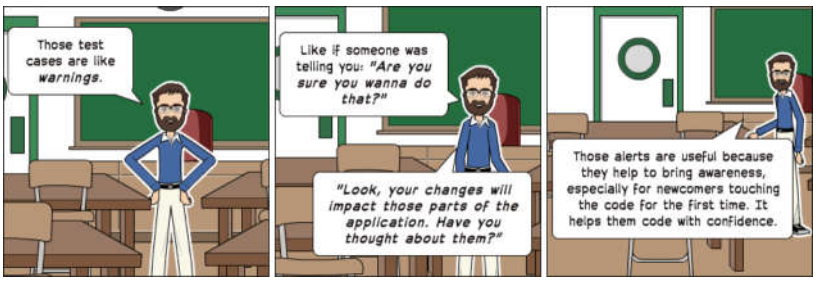
We are using relative imports inside the app modules so we can have the freedom to rename the Django app later on, without having to fix all the absolute imports.

Now let's create a new test file, to test the **SignUpForm**. Add a new test file named **test_form_signup.py**:

accounts/tests/test_form_signup.py

```
from django.test import TestCase
from ..forms import SignUpForm

class SignUpFormTest(TestCase):
    def test_form_has_fields(self):
        form = SignUpForm()
        expected = ['username', 'ema
        actual = list(form.fields)
        self.assertSequenceEqual(exp
```

probably end up having to fix a few test cases, even if we didn't break anything.



Those alerts are useful because they help to bring awareness, especially for newcomers touching the code for the first time. It helps them code with confidence.

Improving the Sign Up Template

Let's work a little bit on it. Here we can use Bootstrap 4 cards components to make it look good.

Go to https://www.toptal.com/designers/subtlepatterns/ and find a nice background pattern to use as a background of the accounts pages. Download it, create a new folder named **img** inside the **static** folder, and place the image there.

Then after that, create a new CSS file named **accounts.css** in the **static/css**. The result should be the following:

```
myproject/
 |-- myproject/
```

```
|     |     |-- css/
|     |     |     |-- accounts.css  <-
|     |     |     |-- app.css
|     |     |     +-- bootstrap.min.cs
|     |     +-- img/
|     |     |     +-- shattered.png  <
|     |-- templates/
|     |-- db.sqlite3
|     +-- manage.py
+-- venv/
```

Now edit the **accounts.css** file:

static/css/accounts.css

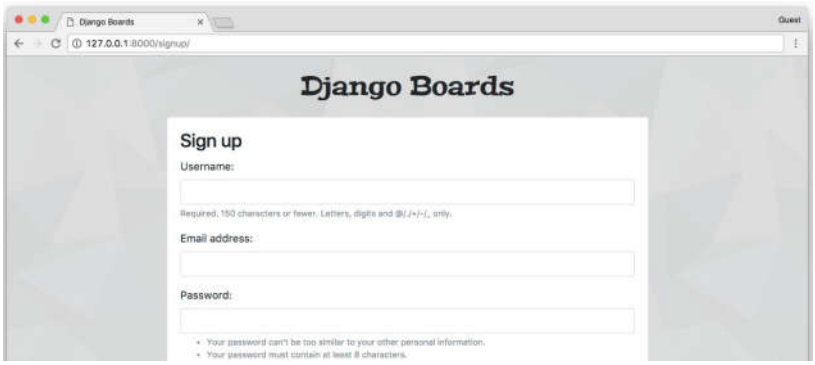
```
body {
  background-image: url(../img/shatt
}

.logo {
  font-family: 'Peralta', cursive;
}

.logo a {
  color: rgba(0,0,0,.9);
}

.logo a:hover,
.logo a:active {
  text-decoration: none;
}
```

In the **signup.html** template, we can change it to make use of the new CSS and also take the Bootstrap 4 card components into use:

templates/signup.html

```
{% block stylesheet %}
  <link rel="stylesheet" href="{% st
{% endblock %}

{% block body %}
  <div class="container">
    <h1 class="text-center logo my-4
      <a href="{% url 'home' %}">Dja
    </h1>
    <div class="row justify-content-
      <div class="col-lg-8 col-md-10
        <div class="card">
          <div class="card-body">
            <h3 class="card-title">S
            <form method="post" nova
              {% csrf_token %}
              {% include 'includes/f
              <button type="submit"
            </form>
          </div>
          <div class="card-footer te
            Already have an account?
          </div>
        </div>
      </div>
    </div>
  </div>
{% endblock %}
```

With that, this should be our sign up page right now:



Logout

To keep a natural flow in the implementation, let's add the log out view. First, edit the **urls.py** to add a new route:

myproject/urls.py

```
from django.conf.urls import url
from django.contrib import admin
from django.contrib.auth import view

from accounts import views as accoun
from boards import views

urlpatterns = [
    url(r'^$', views.home, name='home
    url(r'^signup/$', accounts_views
    url(r'^logout/$', auth_views.Log
    url(r'^boards/(?P<pk>\d+)/$', vi
    url(r'^boards/(?P<pk>\d+)/new/$'
    url(r'^admin/', admin.site.urls)
]
```

We imported the **views** from the Django's contrib module. We renamed it to **auth_views** to avoid clashing with the **boards.views**. Notice that this view is a little bit different: `LogoutView.as_view()`. It's a Django's class-based view. So far we have only implemented views as Python functions. The class-based views provide a more flexible way to extend and reuse

`LOGOUT_REDIRECT_URL` variable to the bottom of the file:

myproject/settings.py

```
LOGOUT_REDIRECT_URL = 'home'
```

Here we are passing the name of the URL pattern we want to redirect the user after the log out.

After that, it's already done. Just access the URL **127.0.0.1:8000/logout/** and you will be logged out. But hold on a second. Before you log out, let's create the dropdown menu for logged in users.

Displaying Menu For Authenticated Users

Now we will need to do some tweaks in our **base.html** template. We have to add a dropdown menu with the logout link.

The Bootstrap 4 dropdown component needs jQuery to work.

First, go to jquery.com/download/ and download the **compressed, production jQuery 3.2.1** version.

Inside the **static** folder, create a new folder named **js**. Copy the **jquery-3.2.1.min.js** file to there.

Bootstrap 4 also needs a library called **Popper** to work. Go to popper.js.org and download the latest version.

Inside the **popper.js-1.12.5** folder, go to **dist/umd** and copy the file **popper.min.js** to our **js** folder. Pay attention here; Bootstrap 4 will only work with the **umd/popper.min.js**. So make sure you are copying the right file.

If you no longer have all the Bootstrap 4 files, download it again from getbootstrap.com.

Similarly, copy the **bootstrap.min.js** file to our **js** folder as well.

The final result should be:

```
myproject/
 |-- myproject/
 |     |-- accounts/
 |     |-- boards/
 |     |-- myproject/
 |     |-- static/
 |     |     |-- css/
 |     |     +-- js/
```

```
|     |-- db.sqlite3
|     +-- manage.py
+-- venv/
```

In the bottom of the **base.html** file, add the scripts *after* the `{% endblock body %}`:

templates/base.html

```
{% load static %}<!DOCTYPE html>
<html>
  <head>
    <meta charset="utf-8">
    <title>{% block title %}Django B
    <link href="https://fonts.google
    <link rel="stylesheet" href="{% 
    <link rel="stylesheet" href="{% 
    {% block stylesheet %}{% endbloc
  </head>
  <body>
    {% block body %}
    <!-- code suppressed for brevity
    {% endblock body %}
    <script src="{% static 'js/jquer
    <script src="{% static 'js/poppe
    <script src="{% static 'js/boots
  </body>
</html>
```

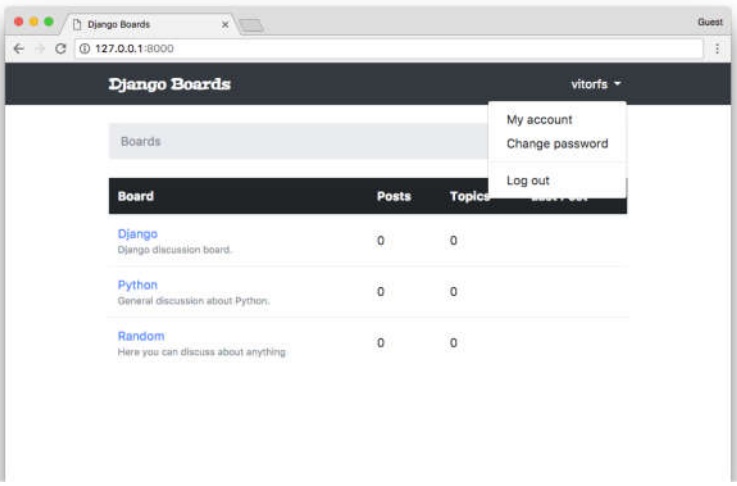
If you found the instructions confusing, just download the files using the direct links below:

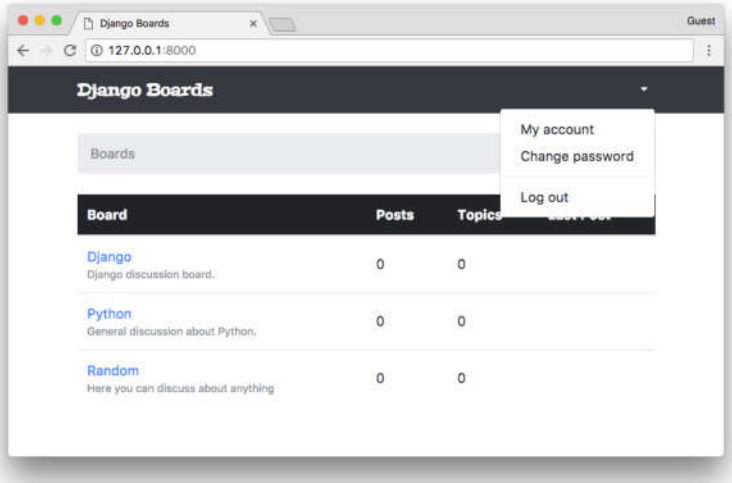
- https://code.jquery.com/jquery-3.2.1.min.js
- https://cdnjs.cloudflare.com/ajax/libs/popper.js/1.11.0/umd/popper.min.js
- https://maxcdn.bootstrapcdn.com/bootstrap

Now we can add the Bootstrap 4 dropdown menu:

templates/base.html

```
<nav class="navbar navbar-expand-sm
  <div class="container">
    <a class="navbar-brand" href="{%
    <button class="navbar-toggler" t
      <span class="navbar-toggler-ic
    </button>
    <div class="collapse navbar-coll
      <ul class="navbar-nav ml-auto"
        <li class="nav-item dropdown
          <a class="nav-link dropdow
            {{ user.username }}
          </a>
          <div class="dropdown-menu
            <a class="dropdown-item"
            <a class="dropdown-item"
            <div class="dropdown-div
            <a class="dropdown-item"
          </div>
        </li>
      </ul>
    </div>
  </div>
</nav>
```





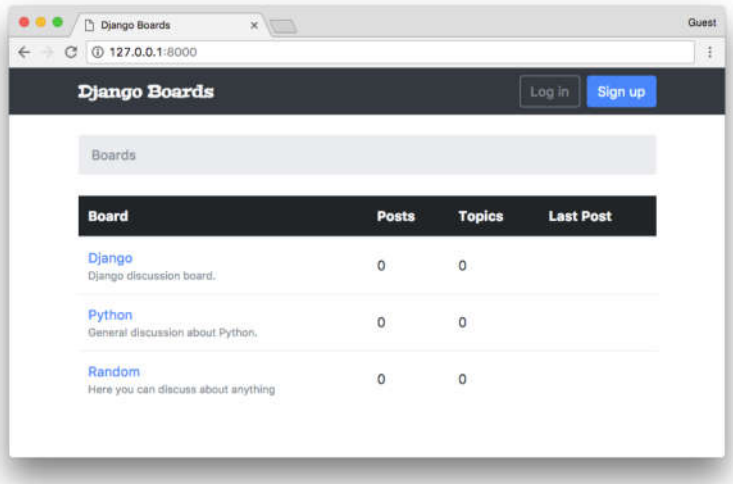
It's working. But the dropdown is showing regardless of the user being logged in or not. The difference is that now the username is empty, and we can only see an arrow.

We can improve it a little bit:

```
<nav class="navbar navbar-expand-sm
  <div class="container">
    <a class="navbar-brand" href="{%
    <button class="navbar-toggler" t
      <span class="navbar-toggler-ic
    </button>
    <div class="collapse navbar-coll
      {% if user.is_authenticated %}
        <ul class="navbar-nav ml-aut
          <li class="nav-item dropdo
            <a class="nav-link dropd
              {{ user.username }}
            </a>
            <div class="dropdown-men
              <a class="dropdown-ite
              <a class="dropdown-ite
              <div class="dropdown-d
```

```
        {% else %}
          <form class="form-inline ml-
            <a href="#" class="btn btn
            <a href="{% url 'signup' %
          </form>
        {% endif %}
      </div>
    </div>
  </nav>
```

Now we are telling Django to show the dropdown menu if the user is logged in, and if not, show the log in and sign up buttons:



Login

First thing, add a new URL route:

myproject/urls.py

```
from django.conf.urls import url
from django.contrib import admin
```

```
urlpatterns = [
    url(r'^$', views.home, name='home
    url(r'^signup/$', accounts_views
    url(r'^login/$', auth_views.Logi
    url(r'^logout/$', auth_views.Log
    url(r'^boards/(?P<pk>\d+)/$', vi
    url(r'^boards/(?P<pk>\d+)/new/$'
    url(r'^admin/', admin.site.urls)
]
```

Inside the `as_view()` we can pass some extra parameters, so to override the defaults. In this case, we are instructing the **LoginView** to look for a template at **login.html**.

Edit the **settings.py** and add the following configuration:

myproject/settings.py

```
LOGIN_REDIRECT_URL = 'home'
```

This configuration is telling Django where to redirect the user after a successful login.

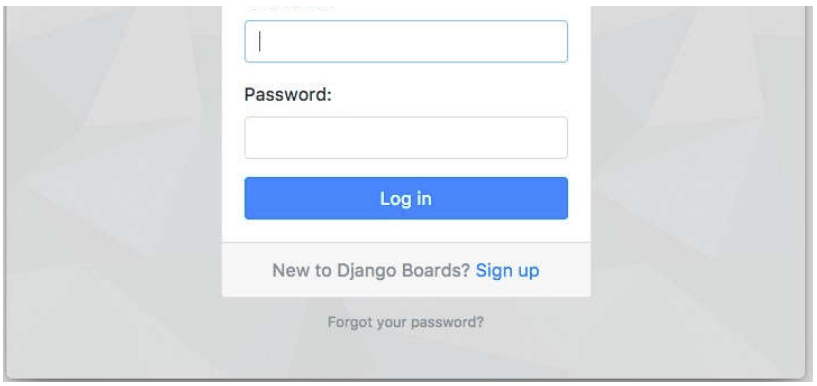
Finally, add the login URL to the **base.html** template:

templates/base.html

```
<a href="{% url 'login' %}" class="b
```

We can create a template similar to the sign up

```
{% extends 'base.html' %}

{% load static %}

{% block stylesheet %}
  <link rel="stylesheet" href="{% st
{% endblock %}

{% block body %}
  <div class="container">
    <h1 class="text-center logo my-4
      <a href="{% url 'home' %}">Dja
    </h1>
    <div class="row justify-content-
      <div class="col-lg-4 col-md-6
        <div class="card">
          <div class="card-body">
            <h3 class="card-title">L
            <form method="post" nova
              {% csrf_token %}
              {% include 'includes/f
              <button type="submit"
            </form>
          </div>
          <div class="card-footer te
            New to Django Boards? <a
          </div>
        </div>
        <div class="text-center py-2
          <small>
            <a href="#" class="text-
          </small>
        </div>
      </div>
    </div>
  </div>
{% endblock %}
```



And we are repeating HTML templates. Let's refactor it.

Create a new template named **base_accounts.html**:

templates/base_accounts.html

```
{% extends 'base.html' %}

{% load static %}

{% block stylesheet %}
  <link rel="stylesheet" href="{% st
{% endblock %}

{% block body %}
  <div class="container">
    <h1 class="text-center logo my-4
      <a href="{% url 'home' %}">Dja
    </h1>
    {% block content %}
    {% endblock %}
  </div>
{% endblock %}
```

Now use it on both **signup.html** and **login.html**:

```
{% block title %}Log in to Django Bo

{% block content %}
  <div class="row justify-content-ce
    <div class="col-lg-4 col-md-6 co
      <div class="card">
        <div class="card-body">
          <h3 class="card-title">Log
          <form method="post" novali
            {% csrf_token %}
            {% include 'includes/for
            <button type="submit" cl
          </form>
        </div>
        <div class="card-footer text
          New to Django Boards? <a h
        </div>
      </div>
      <div class="text-center py-2">
        <small>
          <a href="#" class="text-mu
        </small>
      </div>
    </div>
  </div>
{% endblock %}
```

We still don't have the password reset URL, so let's leave it as `#` for now.

templates/signup.html

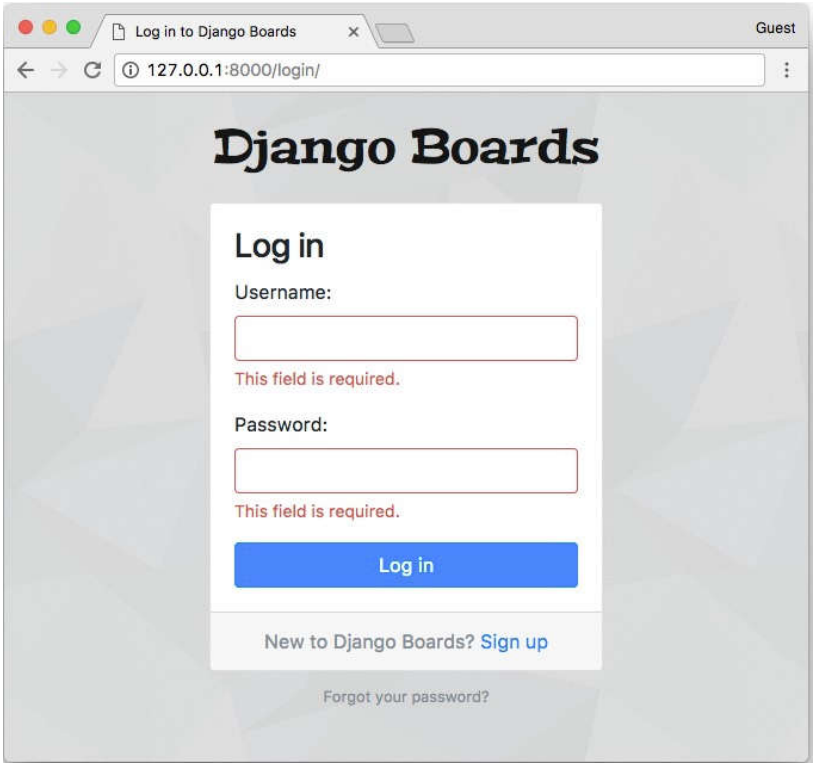
```
{% extends 'base_accounts.html' %}

{% block title %}Sign up to Django B

{% block content %}
  <div class="row justify-content-ce
```

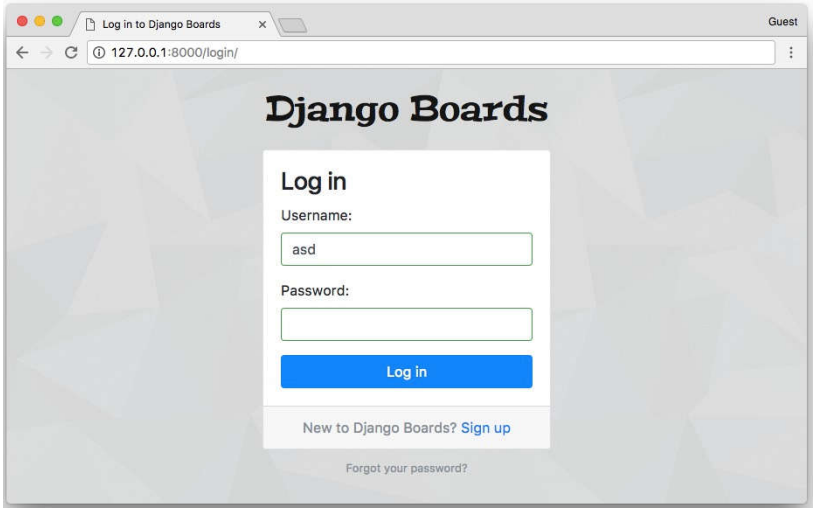
```
            <form method="post" novali
              {% csrf_token %}
              {% include 'includes/form
              <button type="submit" cl
            </form>
          </div>
          <div class="card-footer text-
            Already have an account? <
          </div>
        </div>
      </div>
    </div>
  {% endblock %}
```

Notice that we added the log in URL: `<a href="{% url 'login' %}">Log in</a>`.

Log In Non Field Errors

If we submit the log in form empty, we get some nice error messages:





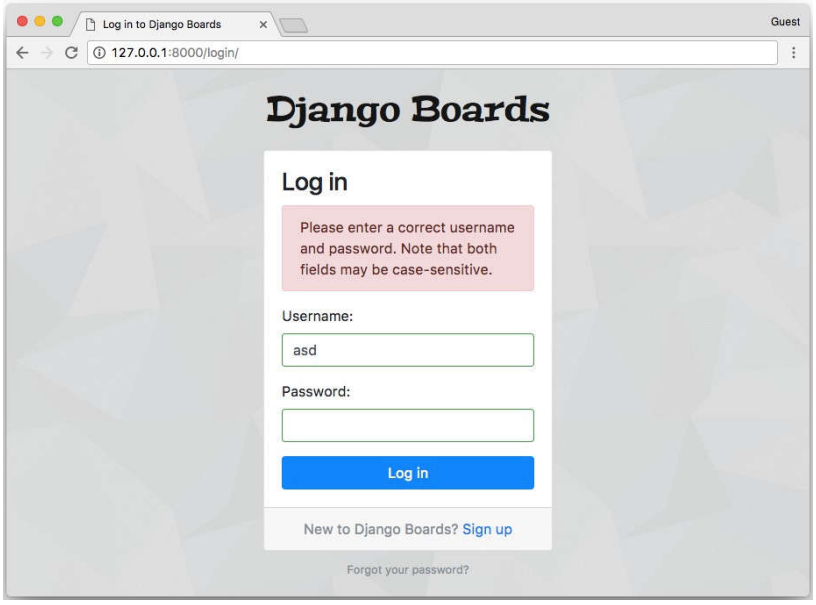
A little bit misleading. The fields are showing green, suggesting they are okay. Also, there's no message saying anything.

That's because forms have a special type of error, which is called **non-field errors**. It's a collection of errors that are not related to a specific field. Let's refactor the **form.html** partial template to display those errors as well:

templates/includes/form.html

```
{% load widget_tweaks %}

{% if form.non_field_errors %}
  <div class="alert alert-danger" ro
    {% for error in form.non_field_e
      <p{% if forloop.last %} class=
    {% endfor %}
  </div>
{% endif %}

{% for field in form %}
  <!-- code suppressed -->
```

thing. Because the `p` tag has a `margin-bottom`. And a form may have several non-field errors. For each non-field error, we render a `p` tag with the error. Then I'm checking if it's the last error to render. If so, we add a Bootstrap 4 CSS class `mb-0` which stands for "margin bottom = 0". Then the alert doesn't look weird, with some extra space. Again, just a very minor detail. I did that just to keep the consistency of the spacing.



We still have to deal with the password field though. The thing is, Django never returned the data of password fields to the client. So, instead of trying to do something smart, let's just ignore the `is-valid` and `is-invalid` CSS classes in some cases. But our form template already looks complicated. We can move some of the code to a **template tag**.

Creating Custom Template Tags

The structure should be the following:

```
myproject/
 |-- myproject/
 |     |-- accounts/
 |     |-- boards/
 |     |     |-- migrations/
 |     |     |-- templatetags/
 |     |     |     |-- __init__.py
 |     |     |     +-- form_tags.py
 |     |     |-- __init__.py
 |     |     |-- admin.py
 |     |     |-- apps.py
 |     |     |-- models.py
 |     |     |-- tests.py
 |     |     +-- views.py
 |     |-- myproject/
 |     |-- static/
 |     |-- templates/
 |     |-- db.sqlite3
 |     +-- manage.py
 +-- venv/
```

In the **form_tags.py** file, let's create two template tags:

boards/templatetags/form_tags.py

```
from django import template

register = template.Library()

@register.filter
def field_type(bound_field):
    return bound_field.field.widget.

@register.filter
```

```
            css_class = 'is-invalid'
        elif field_type(bound_field)
            css_class = 'is-valid'
    return 'form-control {}'.format(
```

Those are *template filters*. They work like this:

First, we load it in a template as we do with the **widget_tweaks** or **static** template tags. Note that after creating this file, you will have to manually stop the development server and start it again so Django can identify the new template tags.

```
{% load form_tags %}
```

Then after that, we can use them in a template:

```
{{ form.username|field_type }}
```

Will return:

```
'TextInput'
```

Or in case of the **input_class**:

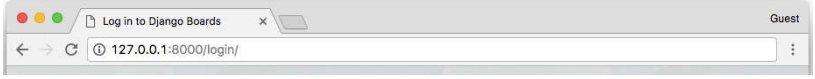
```
{{ form.username|input_class }}

<!-- if the form is not bound, it wi
'form-control '

<!-- if the form is bound and valid:
'form-control is-valid'
```

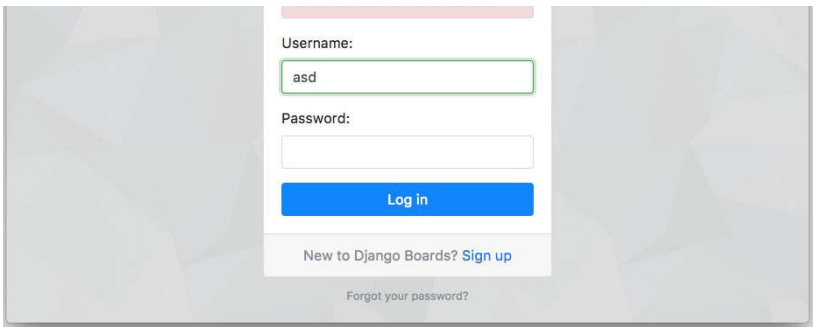
template tags:

templates/includes/form.html

```
{% load form_tags widget_tweaks %}

{% if form.non_field_errors %}
  <div class="alert alert-danger" ro
    {% for error in form.non_field_e
      <p{% if forloop.last %} class=
    {% endfor %}
  </div>
{% endif %}

{% for field in form %}
  <div class="form-group">
    {{ field.label_tag }}
    {% render_field field class=fiel
    {% for error in field.errors %}
      <div class="invalid-feedback">
        {{ error }}
      </div>
    {% endfor %}
    {% if field.help_text %}
      <small class="form-text text-m
        {{ field.help_text|safe }}
      </small>
    {% endif %}
  </div>
{% endfor %}
```

Much better, right? Reduced the complexity of the template. It looks cleaner now. And it also solved the problem with the password field displaying a green border:





Testing the Template Tags

First, let's just organize the **boards'** tests a little bit. Like we did with the **accounts** app, create a new folder named **tests**, add a **__init__.py**, copy the **tests.py** and rename it to just **test_views.py** for now.

Add a new empty file named **test_templatetags.py**.

```
myproject/
 |-- myproject/
 |     |-- accounts/
 |     |-- boards/
 |     |     |-- migrations/
 |     |     |-- templatetags/
 |     |     |-- tests/
 |     |     |     |-- __init__.py
 |     |     |     |-- test_templatetag
 |     |     |     +-- test_views.py  <
 |     |     |-- __init__.py
 |     |     |-- admin.py
 |     |     |-- apps.py
 |     |     |-- models.py
 |     |     +-- views.py
 |     |-- myproject/
 |     |-- static/
 |     |-- templates/
```

Fix the **test_views.py** imports:

boards/tests/test_views.py

```
from ..views import home, board_topi
from ..models import Board, Topic, P
from ..forms import NewTopicForm
```

Execute the tests just to make sure everything is working.

boards/tests/test_templatetags.py

```
from django import forms
from django.test import TestCase
from ..templatetags.form_tags import

class ExampleForm(forms.Form):
    name = forms.CharField()
    password = forms.CharField(widge
    class Meta:
        fields = ('name', 'password'

class FieldTypeTests(TestCase):
    def test_field_widget_type(self)
        form = ExampleForm()
        self.assertEquals('TextInput
        self.assertEquals('PasswordI

class InputClassTests(TestCase):
    def test_unbound_field_initial_s
        form = ExampleForm()   # unbo
        self.assertEquals('form-cont

    def test_valid_bound_field(self)
        form = ExampleForm({'name':
        self.assertEquals('form-cont
```

```
        self.assertEquals( form-conte
```

We created a form class to be used in the tests then added test cases covering the possible scenarios in the two template tags.

```
python manage.py test
```

```
Creating test database for alias 'de
System check identified no issues (0
...............................
----------------------------------
Ran 32 tests in 0.846s

OK
Destroying test database for alias '
```

Password Reset

The password reset process involves some nasty URL patterns. But as we discussed in the previous tutorial, we don't need to be an expert in regular expressions. It's just a matter of knowing the common ones.

Another important thing before we start is that, for the password reset process, we need to send emails. It's a little bit complicated in the beginning because we need an external service. For now, we won't be configuring a production quality email service. In fact, during the development phase, we can use Django's debug tools to check if the

Console Email Backend

The idea is during the development of the project, instead of sending real emails, we just log them. There are two options: writing all emails in a text file or simply displaying them in the console. I find the latter option more convenient because we are already using a console to run the development server and the setup is a bit easier.

Edit the **settings.py** module and add the `EMAIL_BACKEND` variable to the end of the file:

myproject/settings.py

```
EMAIL_BACKEND = 'django.core.mail.ba
```

Configuring the Routes

The password reset process requires four views:

- A page with a form to start the reset process;
- A success page saying the process initiated, instructing the user to check their spam folders, etc.;
- A page to check the token sent via email;
- A page to tell the user if the reset was

anything. All we need to do is add the routes to the **urls.py** and create the templates.

myproject/urls.py (view complete file contents)

```
url(r'^reset/$',
    auth_views.PasswordResetView.as_
        template_name='password_rese
        email_template_name='passwor
        subject_template_name='passw
    ),
    name='password_reset'),
url(r'^reset/done/$',
    auth_views.PasswordResetDoneView
    name='password_reset_done'),
url(r'^reset/(?P<uidb64>[0-9A-Za-z_\
    auth_views.PasswordResetConfirmV
    name='password_reset_confirm'),
url(r'^reset/complete/$',
    auth_views.PasswordResetComplete
    name='password_reset_complete'),
]
```

The `template_name` parameter in the password reset views are optional. But I thought it would be a good idea to re-define it, so the link between the view and the template be more obvious than just using the defaults.

Inside the **templates** folder, the following template files:

- **password_reset.html**
- **password_reset_email.html**: this template is the body of the email message sent to the user

- **password_reset_done.html**
- **password_reset_confirm.html**
- **password_reset_complete.html**

Before we start implementing the templates, let's prepare a new test file.

We can add just some basic tests because those views and forms are already tested in the Django code. We are going to test just the specifics of our application.

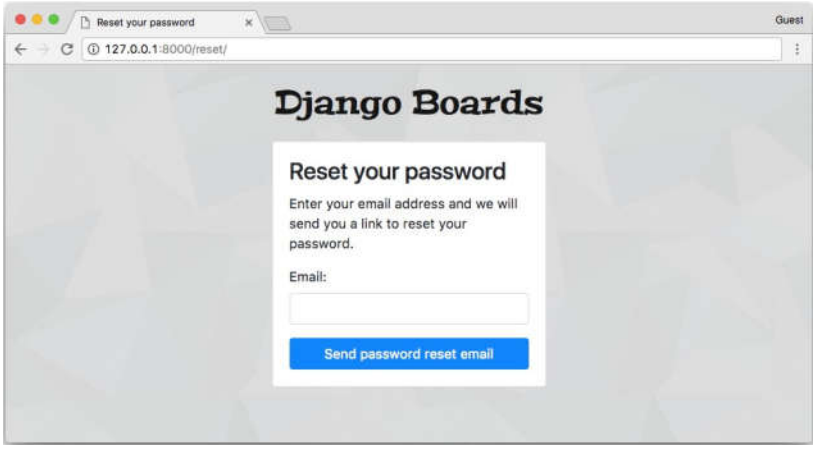
Create a new test file named **test_view_password_reset.py** inside the **accounts/tests** folder.

Password Reset View

templates/password_reset.html

```
{% extends 'base_accounts.html' %}

{% block title %}Reset your password

{% block content %}
  <div class="row justify-content-ce
    <div class="col-lg-4 col-md-6 co
      <div class="card">
        <div class="card-body">
          <h3 class="card-title">Res
          <p>Enter your email addres
          <form method="post" novali
            {% csrf_token %}
            {% include 'includes/for
```

```
    </div>
  </div>
{% endblock %}
```



accounts/tests/test_view_password_reset.py

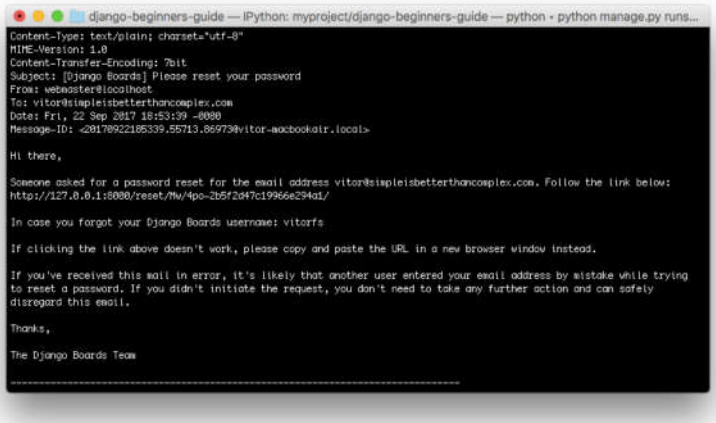
```
from django.contrib.auth import view
from django.contrib.auth.forms impor
from django.contrib.auth.models impo
from django.core import mail
from django.core.urlresolvers import
from django.urls import resolve
from django.test import TestCase


class PasswordResetTests(TestCase):
    def setUp(self):
        url = reverse('password_rese
        self.response = self.client.

    def test_status_code(self):
        self.assertEquals(self.respo

    def test_view_function(self):
        view = resolve('/reset/')
        self.assertEquals(view.func.

    def test_csrf(self):
```

```
        self.assertIsInstance(form,

    def test_form_inputs(self):
        '''
        The view must contain two inp
        '''
        self.assertContains(self.resp
        self.assertContains(self.resp


class SuccessfulPasswordResetTests(Te
    def setUp(self):
        email = 'john@doe.com'
        User.objects.create_user(use
        url = reverse('password_rese
        self.response = self.client.p

    def test_redirection(self):
        '''
        A valid form submission shoul
        '''
        url = reverse('password_rese
        self.assertRedirects(self.re

    def test_send_password_reset_ema
        self.assertEqual(1, len(mail


class InvalidPasswordResetTests(Test
    def setUp(self):
        url = reverse('password_rese
        self.response = self.client.p

    def test_redirection(self):
        '''
        Even invalid emails in the da
        redirect the user to `passwo
        '''
        url = reverse('password_rese
        self.assertRedirects(self.re
```

```
[Django Boards] Please reset your pa
```

templates/password_reset_email.html

```
Hi there,

Someone asked for a password reset f
Follow the link below:
{{ protocol }}://{{ domain }}{% url

In case you forgot your Django Board

If clicking the link above doesn't w
in a new browser window instead.

If you've received this mail in erro
your email address by mistake while
initiate the request, you don't need
disregard this email.

Thanks,

The Django Boards Team
```



accounts/tests folder.

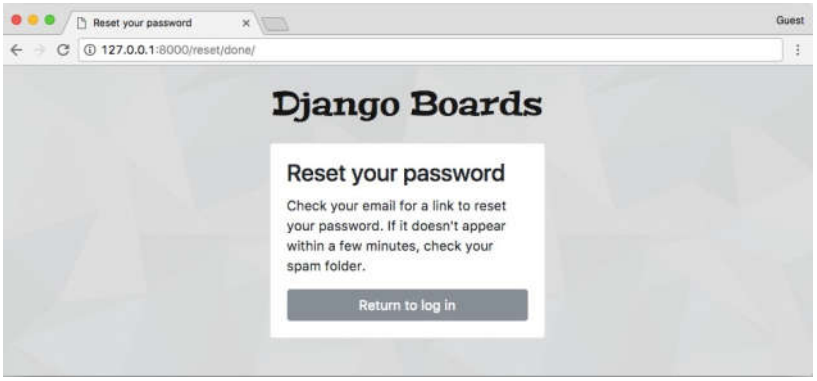
accounts/tests/test_mail_password_reset.py

```
from django.core import mail
from django.contrib.auth.models impo
from django.urls import reverse
from django.test import TestCase

class PasswordResetMailTests(TestCas
    def setUp(self):
        User.objects.create_user(use
        self.response = self.client.
        self.email = mail.outbox[0]

    def test_email_subject(self):
        self.assertEqual('[Django Bo

    def test_email_body(self):
        context = self.response.cont
        token = context.get('token')
        uid = context.get('uid')
        password_reset_token_url = r
            'uidb64': uid,
            'token': token
        })
        self.assertIn(password_reset
        self.assertIn('john', self.e
        self.assertIn('john@doe.com'

    def test_email_to(self):
        self.assertEqual(['john@doe.
```

This test case grabs the email sent by the application, and examine the subject line, the body contents, and to who was the email sent to.

Password Reset Done View

```
{% block title %}Reset your password

{% block content %}
  <div class="row justify-content-ce
    <div class="col-lg-4 col-md-6 co
      <div class="card">
        <div class="card-body">
          <h3 class="card-title">Res
          <p>Check your email for a
          <a href="{% url 'login' %}
        </div>
      </div>
    </div>
  </div>
{% endblock %}
```



accounts/tests/test_view_password_reset.py

```
from django.contrib.auth import view
from django.core.urlresolvers import
from django.urls import resolve
from django.test import TestCase

class PasswordResetDoneTests(TestCas
    def setUp(self):
        url = reverse('password_rese
        self.response = self.client.

    def test_status_code(self):
```

```
        self.assertEquals(view.func.
```

Password Reset Confirm View

templates/password_reset_confirm.html

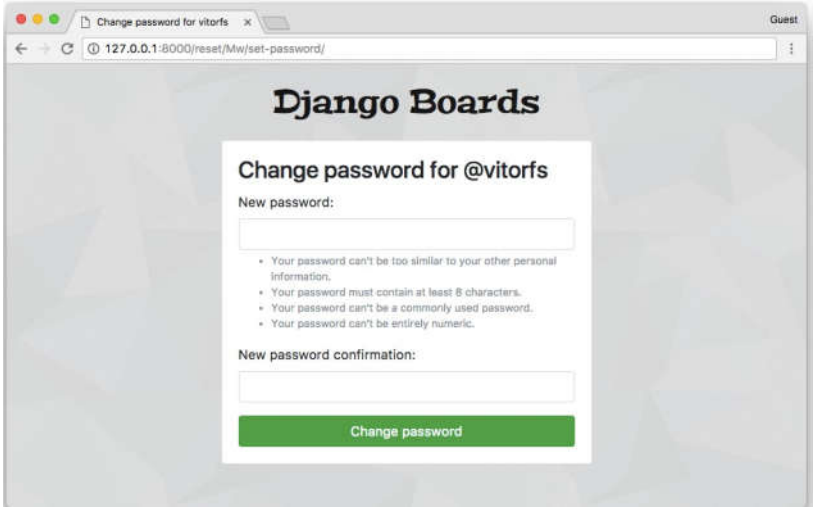
```
{% extends 'base_accounts.html' %}

{% block title %}
  {% if validlink %}
    Change password for {{ form.user
  {% else %}
    Reset your password
  {% endif %}
{% endblock %}

{% block content %}
  <div class="row justify-content-ce
    <div class="col-lg-6 col-md-8 co
      <div class="card">
        <div class="card-body">
          {% if validlink %}
            <h3 class="card-title">C
            <form method="post" nova
              {% csrf_token %}
              {% include 'includes/f
              <button type="submit"
            </form>
          {% else %}
            <h3 class="card-title">R
            <div class="alert alert-
              It looks like you clic
            </div>
            <a href="{% url 'passwor
          {% endif %}
        </div>
      </div>
    </div>
  </div>
```

in the email. It looks like this:

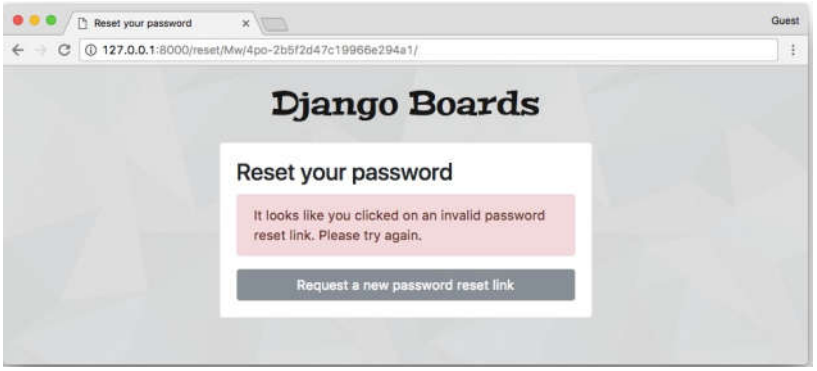
http://127.0.0.1:8000/reset/Mw/4po-2b5f2d47c19966e294a1/

During the development phase, grab this link from the email in the console.

If the link is valid:



Or if the link has already been used:



accounts/tests/test_view_password_reset.py

```
from django.contrib.auth.tokens impo
from django.utils.encoding import fo
from django.utils.http import urlsaf
```

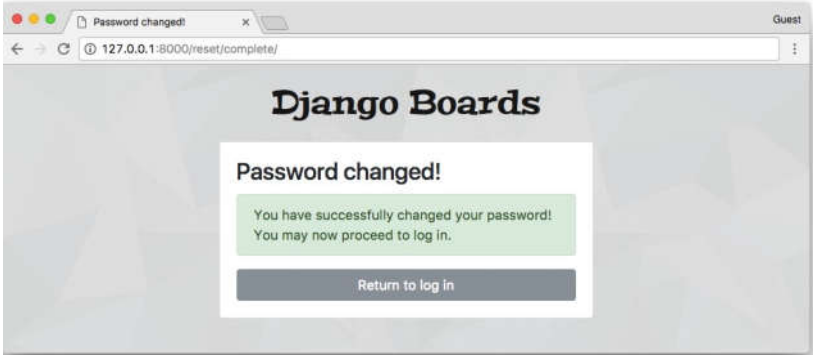
```
from django.urls import resolve
from django.test import TestCase


class PasswordResetConfirmTests(Test
    def setUp(self):
        user = User.objects.create_u

        '''
        create a valid password rese
        based on how django creates
        https://github.com/django/dj
        '''
        self.uid = urlsafe_base64_en
        self.token = default_token_g

        url = reverse('password_rese
        self.response = self.client.

    def test_status_code(self):
        self.assertEquals(self.respo

    def test_view_function(self):
        view = resolve('/reset/{uidb
        self.assertEquals(view.func.

    def test_csrf(self):
        self.assertContains(self.res

    def test_contains_form(self):
        form = self.response.context
        self.assertIsInstance(form,

    def test_form_inputs(self):
        '''
        The view must contain two in
        '''
        self.assertContains(self.res
        self.assertContains(self.res
```

```
        token = default_token_genera

        '''
        invalidate the token by chan
        '''
        user.set_password('abcdef123
        user.save()

        url = reverse('password_rese
        self.response = self.client.

    def test_status_code(self):
        self.assertEquals(self.respo

    def test_html(self):
        password_reset_url = reverse
        self.assertContains(self.res
        self.assertContains(self.res
```

Password Reset Complete View

templates/password_reset_complete.html

```
{% extends 'base_accounts.html' %}

{% block title %}Password changed!{%

{% block content %}
  <div class="row justify-content-ce
    <div class="col-lg-6 col-md-8 co
      <div class="card">
        <div class="card-body">
          <h3 class="card-title">Pas
          <div class="alert alert-su
            You have successfully ch
          </div>
          <a href="{% url 'login' %}
        </div>
      </div>
```



accounts/tests/test_view_password_reset.py

(view complete file contents)

```
from django.contrib.auth import view
from django.core.urlresolvers import
from django.urls import resolve
from django.test import TestCase

class PasswordResetCompleteTests(Tes
    def setUp(self):
        url = reverse('password_rese
        self.response = self.client.

    def test_status_code(self):
        self.assertEquals(self.respo

    def test_view_function(self):
        view = resolve('/reset/compl
        self.assertEquals(view.func.
```

Password Change View

This view is meant to be used by logged in users that want to change their password. Usually, those forms are composed of three fields: old password, new password, and new password confirmation.

```
    name='password_change'),
    url(r'^settings/password/done/$', au
        name='password_change_done'),
```

Those views only works for logged in users. They make use of a view decorator named `@login_required`. This decorator prevents non-authorized users to access this page. If the user is not logged in, Django will redirect them to the login page.

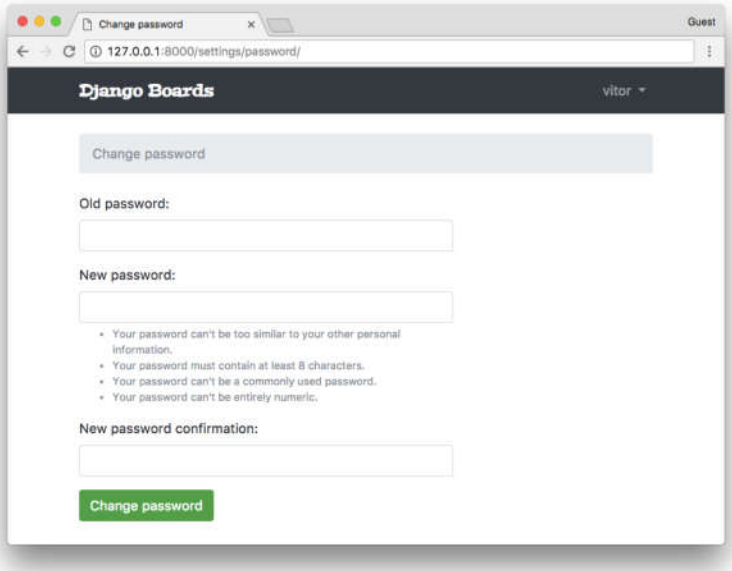
Now we have to define what is the login URL of our application in the **settings.py**:

myproject/settings.py (view complete file contents)

```
LOGIN_URL = 'login'
```

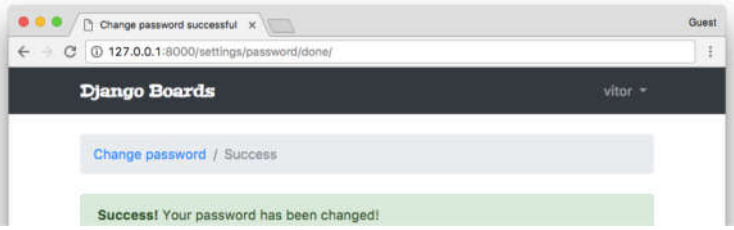
templates/password_change.html

```
{% extends 'base.html' %}

{% block title %}Change password{% e

{% block breadcrumb %}
  <li class="breadcrumb-item active"
{% endblock %}

{% block content %}
  <div class="row">
    <div class="col-lg-6 col-md-8 co
      <form method="post" novalidate
        {% csrf_token %}
        {% include 'includes/form.ht
        <button type="submit" class=
```



templates/password_change_done.html

```
{% extends 'base.html' %}

{% block title %}Change password suc

{% block breadcrumb %}
  <li class="breadcrumb-item"><a hre
  <li class="breadcrumb-item active"
{% endblock %}

{% block content %}
  <div class="alert alert-success" r
    <strong>Success!</strong> Your p
  </div>
  <a href="{% url 'home' %}" class="
{% endblock %}
```



Regarding the password change view, we can implement similar test cases as we have already been doing so far. Create a new test file named **test_view_password_change.py**.

I will list below new types of tests. You can check all the tests I wrote for the password change view clicking in the *view complete file contents* link next to the code snippet. Most of the tests are similar to what we have been doing so far. I moved to an external file to avoid being too repetitive.

accounts/tests /test_view_password_change.py (view complete file contents)

```
class LoginRequiredPasswordChangeTes
    def test_redirection(self):
        url = reverse('password_chan
        login_url = reverse('login')
        response = self.client.get(u
        self.assertRedirects(respons
```

The test above tries to access the **password_change** view without being logged in. The expected behavior is to redirect the user to the login page.

accounts/tests /test_view_password_change.py (view complete file contents)

```
        self.client.login(username='
        self.response = self.client.
```

Here we defined a new class named **PasswordChangeTestCase**. It does a basic setup, creating a user and making a **POST** request to the **password_change** view. In the next set of test cases, we are going to use this class instead of the **TestCase** class and test a successful request and an invalid request:

accounts/tests /test_view_password_change.py (view complete file contents)

```
class SuccessfulPasswordChangeTests(
    def setUp(self):
        super().setUp({
            'old_password': 'old_pas
            'new_password1': 'new_pa
            'new_password2': 'new_pa
        })

    def test_redirection(self):
        '''
        A valid form submission shou
        '''
        self.assertRedirects(self.re

    def test_password_changed(self):
        '''
        refresh the user instance fr
        hash updated by the change p
        '''
        self.user.refresh_from_db()
        self.assertTrue(self.user.ch
```

```
        The resulting response shoul
        '''
        response = self.client.get(re
        user = response.context.get(
        self.assertTrue(user.is_auth


class InvalidPasswordChangeTests(Pas
    def test_status_code(self):
        '''
        An invalid form submission sl
        '''
        self.assertEquals(self.respo

    def test_form_errors(self):
        form = self.response.context
        self.assertTrue(form.errors)

    def test_didnt_change_password(se
        '''
        refresh the user instance fr
        sure we have the latest data
        '''
        self.user.refresh_from_db()
        self.assertTrue(self.user.ch
```

The `refresh_from_db()` method make sure we have the latest state of the data. It forces Django to query the database again to update the data. We have to do it because the **change_password** view update the password in the database. So to test if the password *really* changed, we have to grab the latest data from the database.

Conclusions

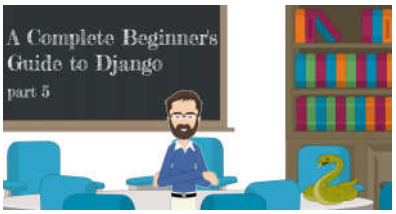
in, log out, password reset, and change password. Now that we have a way to create users and authenticate them, we will be able to proceed with the development of the other views of our application.

We still have to improve lots of things regarding the code design: the templates folder is starting to get messy with too many files. The **boards** app tests are still disorganized. Also, we have to start refactoring the **new topic** view, because now we can retrieve the logged in user. We will get to that part soon.

I hope you enjoyed the forth part of this tutorial series! The fifth part is coming out next week, on Oct 2, 2017. If you would like to get notified when the fifth part is out, you can subscribe to our mailing list.

The source code of the project is available on GitHub. The current state of the project can be found under the release tag **v0.4-lw**. The link below will take you to the right place:

https://github.com/sibtc/django-beginners-guide/tree/v0.4-lw



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Name

Alok Ramteke • 10 months ago

Hello,
when I run python manage.py test , I get following errors:

(venv) C:\Users\Sony\myproject\myproject>python manage.py test
Creating test database for alias 'default'...
System check identified no issues (0 silenced).
.....EFEF.FFFF
==========:
ERROR: test_contains_form (boards.tests.test_views.NewTopicTests)

Traceback (most recent call last):
File "C:\Users\Sony\myproject\myproject\boards\tests\test_views.py", line 87, in test_contains_form
form = response.context.get('form')
AttributeError: 'NoneType' object has no attribute

see more

24 • Reply • Share ›

SCOTTISHCRAWFORD → Alok Ramteke • 22 days ago

I was having the same errors until I noticed that there needs to be an additional line under the setUp function:

```
class NewTopicTests(TestCase):
def setUp(self):
Board.objects.create(name='Django',
description='Django board.')
```

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