

# Django 6: Authentication

IN608: Intermediate Application Development Concepts

# Last Session's Content

- Automation testing
  - Model testing
  - View testing
- LiveServerTestCase

# Today's Content

- Django authentication
  - AbstractUser
  - Auth views
- Django crispy forms
- Session-based authentication

# Django Authentication

# Django Authentication

- Django's `User` model may not always be appropriate
- A site's login may require an email address instead of a username
- Override the default `User` model by providing a value for `AUTH_USER_MODEL` in `mvt/settings.py`
- Resource: <https://docs.djangoproject.com/en/3.0/topics/auth/customizing>

```
AUTH_USER_MODEL = 'polls.User'
```

# Django Authentication

- polls/models.py

```
class User(AbstractUser):  
    username = models.CharField(max_length=25, unique=True, blank=False)  
    email = models.EmailField(unique=True, blank=False)  
    first_name = models.CharField(max_length=200, blank=False)  
    last_name = models.CharField(max_length=200, blank=False)
```

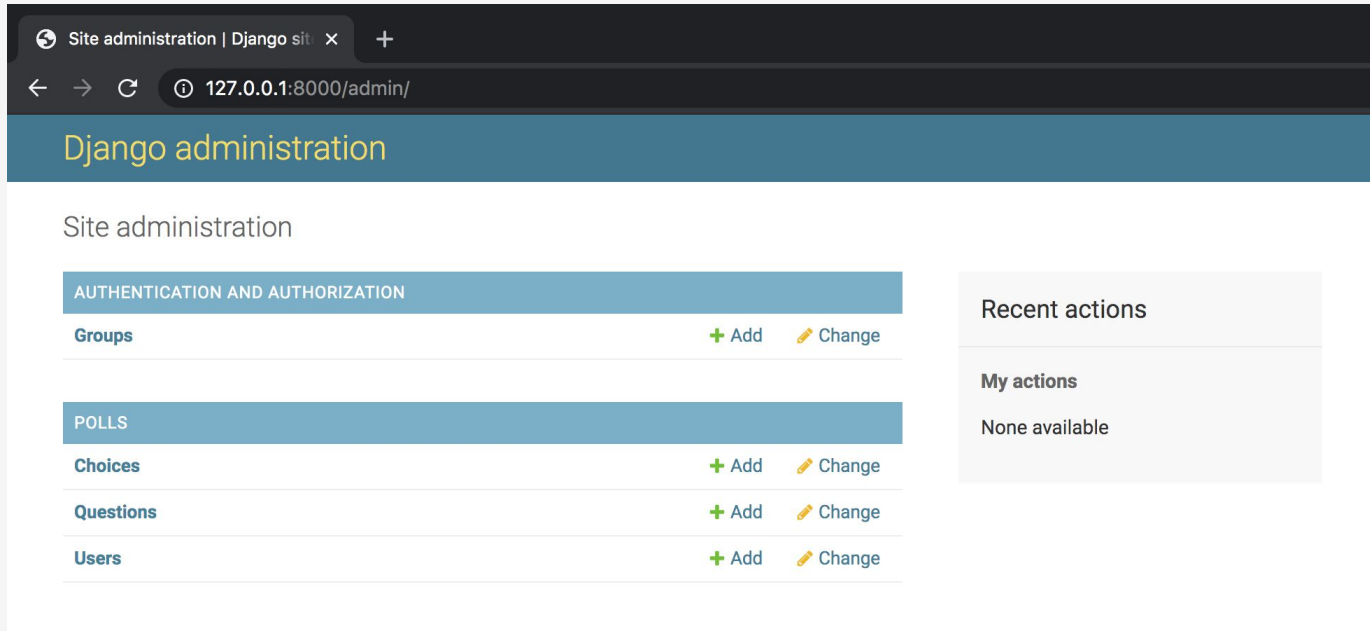
# Django Authentication

- polls/admin.py

```
from django.contrib.auth.admin import UserAdmin
from .models import User, Question, Choice

admin.site.register(User, auth.admin.UserAdmin)
admin.site.register(Question)
admin.site.register(Choice)
```

# Django Authentication





# Django Authentication

- `polls/urls.py`
- `auth_views.LoginView`
  - If login is successful, the view redirects to the URL specified in `mvt/settings.py`, i.e., `LOGIN_REDIRECT_URL`
  - If login is not successful, it displays the login form
- `auth_views.LogoutView`
  - The view redirects to the URL specified in `mvt/settings.py`, i.e., `LOGOUT_REDIRECT_URL`
- Resources:
  - <https://docs.djangoproject.com/en/3.0/topics/auth/default/#django.contrib.auth.views.LoginView>
  - <https://docs.djangoproject.com/en/3.0/topics/auth/default/#django.contrib.auth.views.LogoutView>

```
from django.contrib.auth import views as auth_views
from django.urls import path
from . import views

app_name = 'polls'

urlpatterns = [
    path('accounts/signup/', views.Signup.as_view(), name='signup'),
    path('accounts/login/', auth_views.LoginView.as_view(), name='login'),
    path('accounts/logout/', auth_views.LogoutView.as_view(), name='logout'),
    path('', views.IndexView.as_view(), name='index'), # /polls/
    path('<int:pk>', views.DetailView.as_view(), name='detail'), # /polls/2/
    path('<int:pk>/results/', views.ResultsView.as_view(), name='results'), # /polls/2/results/
    path('<int:question_id>/vote/', views.vote, name='vote'), # /polls/2/vote/
]
```

# Django Authentication

- `mvt/settings.py`
- **Resources:**
  - [https://docs.djangoproject.com/en/3.0/ref/settings/#std:setting-LOGIN\\_REDIRECT\\_URL](https://docs.djangoproject.com/en/3.0/ref/settings/#std:setting-LOGIN_REDIRECT_URL)
  - [https://docs.djangoproject.com/en/3.0/ref/settings/#std:setting-LOGOUT\\_REDIRECT\\_URL](https://docs.djangoproject.com/en/3.0/ref/settings/#std:setting-LOGOUT_REDIRECT_URL)

```
LOGIN_REDIRECT_URL = '/polls/'  
LOGOUT_REDIRECT_URL = '/accounts/login/'
```

# Django Authentication

- In the `polls/` directory, create a file called `forms.py`
- App structure:

```
polls/
  __init__.py
  admin.py
  apps.py
  forms.py
  migrations/
    __init__.py
  models.py
  static/
    polls/
      style.css
  templates/
    polls/
      base.html
      detail.html
      index.html
      results.html
  tests.py
  urls.py
  views.py
```

# Django Authentication

- polls/forms.py
- UserCreationForm
  - Four fields
  - Validates the password using `validate_password()`
  - Sets the user's password using `set_password()`

```
from django.contrib.auth import forms
from .models import User

class SignupForm(forms.UserCreationForm):
    class Meta:
        model = User
        fields = ['username', 'email', 'first_name', 'last_name']
```

# Django Authentication

- `polls/views.py`
- `FormView`
  - A view that display a form
  - On error, displays the form with validation errors
  - On success, redirects to a URL
- `from django.contrib.auth import login`
- `from .forms import SignupForm`
- `from .models import User`
- Resource: <https://docs.djangoproject.com/en/3.0/ref/class-based-views/generic-editing>

```
class SignupView(generic.FormView):
    model = User
    form_class = SignupForm
    template_name = 'registration/signup.html'

    def form_valid(self, form):
        user = form.save()
        login(self.request, user)
        return HttpResponseRedirect(reverse('polls:index'))
```

# Django Authentication

- `polls/views.py`
- `@method_decorator(decorators.login_required)`
- `@method_decorator(decorators.login_required, name='dispatch')`
  - If the user is not logged in, redirect to `LOGIN_REDIRECT_URL` + the current absolute path in the query string, i.e., </accounts/login/?next=/polls/>
  - If the user is logged in, display the view
- `from django.contrib.auth import decorators`
- `from django.utils.decorators import method_decorator`
- Resources:
  - <https://docs.djangoproject.com/en/3.0/topics/auth/default/#the-login-required-decorator>
  - <https://docs.djangoproject.com/en/3.0/topics/class-based-views/intro/#decorating-the-class>

```
@method_decorator(decorators.login_required, name='dispatch')
class IndexView(generic.ListView):
    ...
```

# Django Authentication

- In the `polls/templates/` directory, create a directory called `registration/`
- In the `registration/` directory, create two `.html` files called `login` & `signup`
- App structure:

```
polls/
  __init__.py
  admin.py
  apps.py
  forms.py
  migrations/
    __init__.py
  models.py
  static/
    polls/
      style.css
  templates/
    polls/
      base.html
      detail.html
      index.html
      results.html
    registration/
      login.html
      signup.html
  tests.py
  urls.py
  views.py
```

# Django Crispy Forms



# Django Crispy Forms

- Install Django crispy forms

```
# Windows
...\> pipenv install django-crispy-forms

# Linux or macOS
$ pipenv install django-crispy-forms
```

# Django Crispy Forms

- View Pipfile & Pipfile.lock

```
[[source]]
name = "pypi"
url = "https://pypi.org/simple"
verify_ssl = true

[dev-packages]
selenium = "*"

[packages]
django = "*"
django-crispy-forms = "*"

[requires]
python_version = "3.7"
```

# Django Crispy Forms

- `mvt/settings.py`
- Resources:
  - <https://pypi.org/project/django-crispy-forms>
  - <https://django-crispy-forms.readthedocs.io/en/latest>

```
INSTALLED_APPS = [  
    'polls.apps.PollsConfig',  
    'django.contrib.admin',  
    'django.contrib.auth',  
    'django.contrib.contenttypes',  
    'django.contrib.sessions',  
    'django.contrib.messages',  
    'django.contrib.staticfiles',  
    'crispy_forms',  
]
```

# Django Crispy Forms

- polls/templates/registration/signup.html

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

{% block title %}Polls | Signup{% endblock %}

{% load crispy_forms_tags %}

{% block content %}
<form method="POST">
  {% csrf_token %}
  {{ form|crispy }}
  <input type="submit" value="Signup">
</form>
<br>
<a href="{% url 'polls:login' %}">Login</a>
{% endblock %}
```

# Django Crispy Forms

Polls | Signup

127.0.0.1:8000/polls/accounts/signup/

Username\*

First name\*

Last name\*

Email\*

Password\*

- Your password can't be too similar to your other personal information.
- Your password must contain at least 8 characters.
- Your password can't be a commonly used password.
- Your password can't be entirely numeric.

Password confirmation\*

Enter the same password as before, for verification.

Signup

[Login](#)

Polls | Signup

127.0.0.1:8000/polls/accounts/signup/

Username\*

johndoe123

First name\*

John

Last name\*

Doe

Email\*

jdoe@example.com

Password\*

- Your password can't be too similar to your other personal information.
- Your password must contain at least 8 characters.
- Your password can't be a commonly used password.
- Your password can't be entirely numeric.

Password confirmation\*

**The two password fields didn't match.**

Enter the same password as before, for verification.

Signup

[Login](#)

# Django Crispy Forms

- polls/templates/registration/login.html

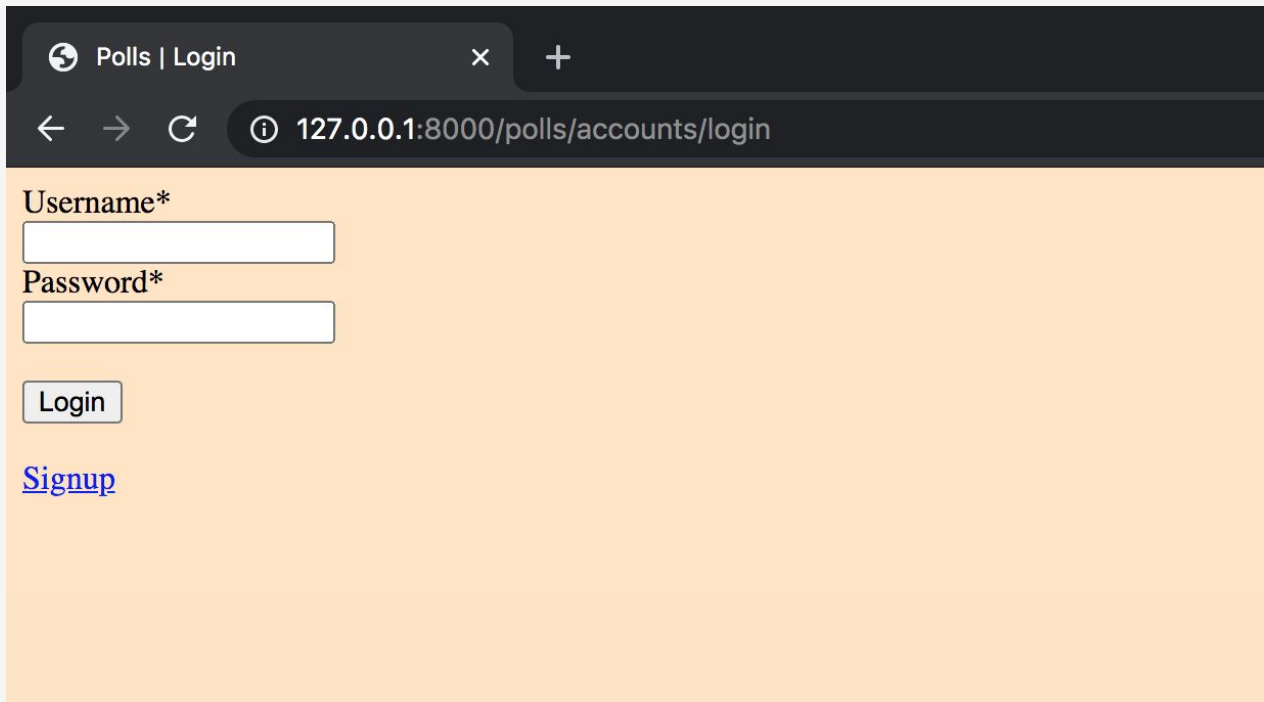
```
{% extends 'polls/base.html' %}

{% block title %}Polls | Login{% endblock %}

{% load crispy_forms_tags %}

{% block content %}
<form method="POST">
  {% csrf_token %}
  {{ form.username|as_crispy_field }} {{ form.password|as_crispy_field }}<br>
  <input type="submit" value="Login">
</form>
<br>
<a href="{% url 'polls:signup' %}">Signup</a>
{% endblock %}
```

# Django Crispy Forms



A screenshot of a web browser window displaying a login page. The browser's address bar shows the URL `127.0.0.1:8000/polls/accounts/login`. The page has a light orange background. The login form consists of two text input fields, one for 'Username\*' and one for 'Password\*', both with rounded rectangular borders. Below the password field is a 'Login' button with rounded corners and a subtle shadow. At the bottom of the form is a blue, underlined link labeled 'Signup'.

Polls | Login

← → ↻ ⓘ 127.0.0.1:8000/polls/accounts/login

Username\*

Password\*

Login

[Signup](#)

# Session-Based Authentication



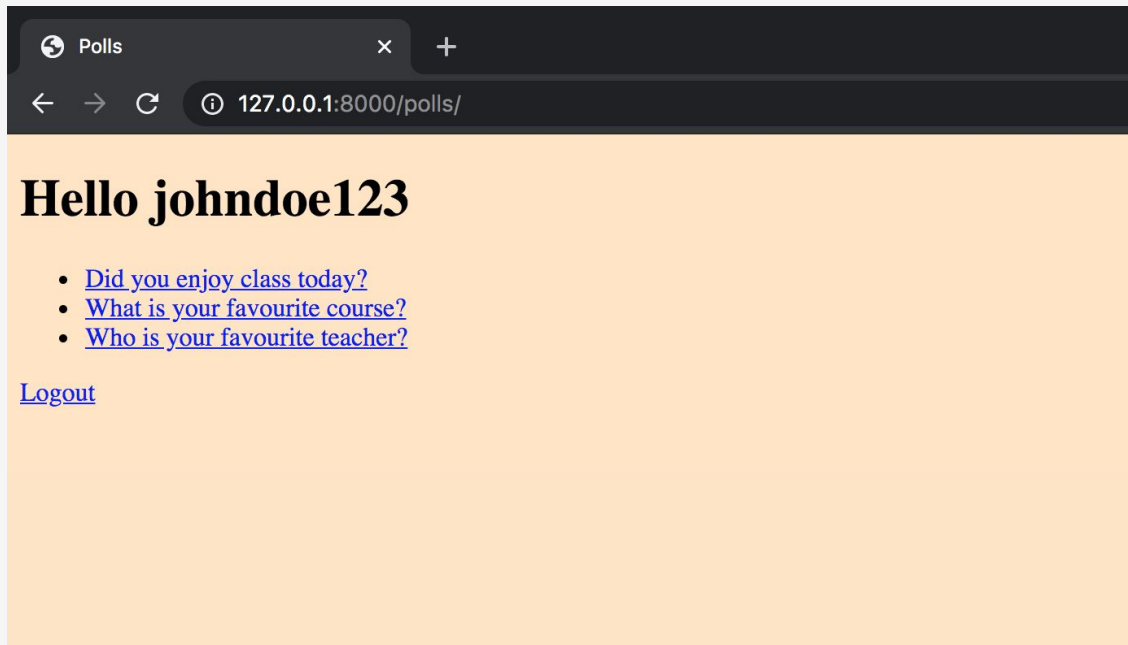
# Session-Based Authentication

- polls/templates/polls/index.html

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

{% block content %}
<h1>Hello {{ user.username }}</h1>
{% if latest_question_list %}
  <ul>
    {% for question in latest_question_list %}
      <li><a href="{% url 'polls:detail' question.id %}">{{ question }}</a></li>
    {% endfor %}
  </ul>
{% else %}
  <p>No polls are available.</p>
{% endif %}
<a href="{% url 'polls:logout' %}">Logout</a>
{% endblock %}
```

# Session-Based Authentication



# Session-Based Authentication

- Session-based authentication
  - A user's logged in state is saved in the server's memory
  - A session is securely created by the server when a user signs in
  - A session ID is stored in a cookie in the user's browser
  - While the user is logged in, the cookie is sent with every request
  - The server looks at the session cookie & reads the session ID
  - If it matches the data stored in the server's memory, it sends a response back to the browser
- Alternative - JSON Web Tokens (token-based authentication)
  - Resource: <https://jwt.io>

# Session-Based Authentication

The screenshot displays a web browser window with a login form on the left and the Chrome DevTools Application tab on the right. The login form has fields for 'Username\*' and 'Password\*', a 'Login' button, and a 'Signup' link. The DevTools Application tab shows the 'Application' panel with a table of cookies. The 'csrfToken' cookie is visible with a value of 'E9WpWRY...' and an expiration date of '2021-07-16T11:...'.

Application

Filter

Only blocked

Name	Value	Domain	Path	Expires / Max-Age	Size	HttpOnly	Secure	SameSite	Priority
csrfToken	E9WpWRY...	127.0...	/	2021-07-16T11:...	73			Lax	Medium

Storage

- Local Storage
- Session Storage
- IndexedDB
- Web SQL
- Cookies

Cache

- Cache Storage
- Application Cache

Background Services

- Background Fetch
- Background Sync
- Notifications
- Payment Handler
- Periodic Background Sync
- Push Messaging

# Session-Based Authentication

The screenshot displays a web browser window with a light orange background. The main content area shows the text "Hello johndoe123" in a large, bold, black font. Below this, there are three bullet points, each with a blue hyperlink: "Did you enjoy class today?", "What is your favourite course?", and "Who is your favourite teacher?". At the bottom left of the content area, there is a blue "Logout" link.

On the right side of the browser window, the Chrome DevTools "Application" tab is open. The left sidebar of this tab shows a tree view of storage areas: Application (Manifest, Service Workers, Clear storage), Storage (Local Storage, Session Storage, IndexedDB, Web SQL, Cookies), Cache (Cache Storage, Application Cache), and Background Services (Background Fetch, Background Sync, Notifications, Payment Handler, Periodic Background Sync, Push Messaging). The "Cookies" item under the Storage section is selected, showing a list of cookies in the main panel.

The cookies table in the DevTools Application tab is as follows:

Name	Value	Domain	Path	Expires / Max-Age	Size	HttpO...	Secure	SameSite	Priority
sessionid	6euynixft2...	127.0...	/	2020-07-31T11:...	41	✓		Lax	Medium
csrftoken	ZalwArm4...	127.0...	/	2021-07-16T11:...	73			Lax	Medium

# Practical

# Programming Activity

- Checkout to master - `git checkout master`
- Create a new branch called 12-practical - `git checkout -b 12-practical`
- Open the file `12-practical.pdf` and work on the tasks described