



Django Level Five

Let's learn something!



Django Bootcamp

- Welcome to Django Level Five!
- This section of the course will focus on User Authentication.
- So far we've only created applications that assume everyone will see the same page.



- This is one of the aspects of Django where there are lots of built in available tools as well as plenty of external packages that enhance functionality.



- We will focus mainly on the built-in tools:
 - Users and the User Model
 - Permissions
 - Groups
 - Passwords and Authentication
 - Logging In and Out



- Let's get started!



Passwords

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- In this lecture we will discuss the general set-up to begin getting ready for User Authentication.
- We'll talk about passwords in general and also discuss some additional library options for security.



- The first thing we need to take care of is setting up our ability to authenticate a User.
- To do this we need to use some built-in apps and make sure they are under the `INSTALLED_APPS` list in `settings.py`



- The apps we will use are
“django.contrib.auth” and
“django.contrib.contenttypes”
- Often these will already be pre-loaded in
the list for you.
- Remember to migrate if you added
them!



- The next thing we need to do is make sure we store our passwords safely.
- **Never store passwords as plain text!**
- We will begin by using the default PBKDF2 algorithm with an SHA256 hash that is built-in to Django.



- This is quite secure for most applications, it requires a massive amount of computing power to crack it.
- But if you want more security you can upgrade to even more secure hashing algorithms.



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- Django makes this really easy, we will also show how to use the bcrypt and Argon2.
- In your virtual environment:
 - **pip install bcrypt**
 - **pip install django[argon2]**
- Depending on your Django version

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- Inside of settings.py you can then pass in the list of PASSWORD_HASHERS to try in the order you want to try them.
- If for some reason you don't have the library support, eventually you will fall back on to the original PBKDF2



- Sometimes users will also try to use a very weak password, such as “password123”.
- We can also add in validator options to prevent a user from doing that.
- We’ll keep things simple and only require a minimum length for now.



- Let's now code through the steps of setting up a password system.
- After this we can set-up our User Models and our Registration Forms.



User Models

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- In this lecture we will discuss how to use Django's built in tools to create User Authorization Models.
- We will also discuss how to set-up media files in your project.



- Previously when we've logged on to the Admin page we've seen that there is already a built-in Authentication and Authorization model set in place.
- In this database there were "Users".
- Let's learn how to use this feature!



- The **User** object has a few key features:
 - Username
 - Email
 - Password
 - First Name
 - Surname



- There are also some other attributes for the **User** object, such as `is_active`, `is_staff`, `is_superuser`.
- Sometimes you will also want to add more attributes to a user, such as their own links or a profile image.



- You can do this in your applications `models.py` file by creating another class that has a relationship to the **User** class.
- Let see an example of what this code would look like inside your `models.py` file!

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

```
# Create your models here.
```

```
class UserProfileInfo(models.Model):
```

```
    # Create relationship (don't inherit from User!)
```

```
    user = models.OneToOneField(User)
```

```
    # Add any additional attributes you want
```

```
    portfolio = models.URLField(blank=True)
```

```
    picture = models.ImageField(upload_to='profile_pics')
```

```
def __str__(self):
```

```
    # Built-in attribute of django.contrib.auth.models.User !
```

```
    return self.user.username
```



- Notice a new field we haven't seen yet, an ImageField.
- This will allow you to store images to a model, typically we will keep any user uploaded content like this in the media file.



- In order to work with images with Python we will need to install the Python Imaging Library with:
 - **pip install pillow**



- Some users may get an error on this command indicating something like jpeg support disabled, in which case use:

```
pip install pillow --global-option="build_ext"  
--global-option="--disable-jpeg"
```



- Once you've created this model you'll have to remember to register it in the admin.py file, with something like:
 - `admin.site.register(UserProfileInfo)`



- Typically images, CSS, JS, etc. all go in the static folder of your project, with the `STATIC_ROOT` variable path defined inside of `settings.py`
- User uploaded content will go to the media folder, with the `MEDIA_ROOT`.

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- Next we will want to implement a Django form that the User can use to work with the website.
- Let's show an example of what this would look like inside the forms.py file of your application.



The code
inside
forms.py

```
from django import forms
from basic_app.models import UserProfileInfo

class UserProfileInfoForm(forms.ModelForm):
    portfolio = forms.URLField(required=False)
    picture = forms.ImageField(required=False)

    class Meta():
        model = UserProfileInfo
        exclude = ('user',|)
```



- Let's now code through the set-up of what we've discussed:
 - User Model
 - Media Directory
 - Handling Images
 - User Form



- Once we've done that we can begin to focus on creating a registration view.



Registration

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- A lot of the coding for working with Users and Authorization happens in the `views.py` file.
- The basic idea is that we check if there is a POST request and then perform some sort of action based off that information.



- Sometimes we will want to save that information directly to the database.
- Other times, we will set `commit=False` so we can manipulate the data before saving it to the database.
- This helps prevent collision errors.



- Figuring out the registration views is an extension of what we learn about when discussing Django Forms.
- Make sure to review that content if you don't remember it!



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- This entire process is best shown through code, so let's jump to our `views.py`
- We will also fix a small mistake made in the previous lecture when working with the forms, and how to keep an eye out for those errors! Let's get started!



Logins

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- Once a user is registered, we want to make sure that they can log in and out of the site.
- In this lecture we will go through the entire process of creating log in / log out functionality.



- This process involves:
 - Setting up the login views
 - Using built-in decorators for access
 - Adding the LOGIN_URL in settings
 - Creating the login.html
 - Editing the urls.py files