



Django Level Three

Time to level up your learning!



- Welcome to Django Level Three!
- Hopefully you are now excited by the possibilities of the MTV workflows we've learned about!
- We are still missing a big piece to creating a full website - user input!



- In this section we will be covering how to use Django Forms to accept User Input and connect it to the database and retrieve it later on.



Let's get started!



Django - Basic Forms

Django Level Three



- In this lecture we will conceptually walk through the process of creating a form with Django!
- We've covered Forms when discussing HTML, so why bother with Django Forms?
- What extra features do they bring?



- Django Forms Advantages:
 - Quickly generate HTML form widgets
 - Validate data and process it into a Python data structure
 - Create form versions of our Models, quickly update models from Forms



- The first thing we need to do is create a `forms.py` file inside the application!
- After that we call Django's built in forms classes (looks very similar to creating models).
- Let's see an example!



- Example inside of forms.py:

```
from django import forms
```

```
class FormName(forms.Form):  
    name = forms.CharField()  
    email = forms.EmailField()  
    text = forms.CharField(widget=forms.Textarea)
```



- Note how similar this feels to creating a model!
- Now that we have the form created inside the application's `forms.py` file, we need to show it by using a view!



- Inside our views.py file we need to import the forms (two ways to do this)
 - `from . import forms`
 - `from forms import FormName`

The `.` just indicates to import from the same directory as the current `.py` file



- We can then create a new view for the form

```
def form_name_view(request):  
    form = forms.FormName()  
    return render(request, 'form_name.html',  
                  {'form': form})
```



- Then we just add the view to the app's urls, either directly or with include(). Directly:

```
from basicapp import views
urlpatterns = [
    url(r'formpage/', views.form_name_view,
        name = 'form_name'),
]
```



- We can then create the templates folder along with the html file that will hold the template tagging for the form.
- Remember to update the settings.py file to reflect the `TEMPLATE_DIR` variable!
- Also remember that your views should reflect subdirectories inside templates!



- So now everything is setup for us to go into the `form_name.html` file inside `templates/basicapp` and add in the actual template tagging that will create the Django Form!



- There are several ways you can “inject” the form using template tagging. You can just pass in the key from the context dictionary:
 - `{{ form }}`



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- Before we continue, let's have a quick side discussion about three topics:
 - HTTP
 - GET
 - POST



- HTTP stands for Hypertext Transfer Protocol and is designed to enable communication between a client and a server.
- The client submits a request, the server then responds.



- The most commonly used methods for this request/response protocol are GET and POST.
- GET - requests data from a resource
- POST - submits data to be process to a resource.



- Those are the basics that we need to know for now, but you can check out the [w3schools.com](https://www.w3schools.com) page on GET/POST for some more details, like what remains in browser history or what can be cached for future use.



- Once you've put in the `{{forms}}` tag you should be able to see a very basic (and ugly) form on the page.
- However there is no `<form>` tag there.
- Let's look at what a more completed form html page would look like...



- On your form_page.html

```
<div class="container">
  <form method="POST">
    {{ form.as_p }}
    {% csrf_token %}
    <input type="submit" class="btn btn-primary" value="Submit">
  </form>
</div>
```

- Some added Bootstrap class styling calls

```
<div class="container">
  <form method="POST">
    {{ form.as_p }}
    {% csrf_token %}
    <input type="submit" class="btn btn-primary" value="Submit">
  </form>
</div>
```

- Also calling `form.as_p` which uses `<p>`

```
<div class="container">
  <form method="POST">
    {{ form.as_p }}
    {% csrf_token %}
    <input type="submit" class="btn btn-primary" value="Submit">
  </form>
</div>
```




- This gives it a nice format to work with.

```
<div class="container">
  <form method="POST">
    {{ form.as_p }}
    {% csrf_token %}
    <input type="submit" class="btn btn-primary" value="Submit">
  </form>
</div>
```



- Check the Django docs for other

```
<div class="container">
  <form method="POST">
    {{ form.as_p }}
    {% csrf_token %}
    <input type="submit" class="btn btn-primary" value="Submit">
  </form>
</div>
```



- Also added {% csrf_token %}

```
<div class="container">
  <form method="POST">
    {{ form.as_p }}
    {% csrf_token %}
    <input type="submit" class="btn btn-primary" value="Submit">
  </form>
</div>
```



- This is the first time we've encountered thinking about site security measures!
- This is a Cross-Site Request Forgery (CSRF) token, which secures the HTTP POST action that is initiated on the subsequent submission of a form.



- The Django framework requires the CSRF token to be present.
- If it is not there, your form may not work!
- It works by using a “hidden input” which is a random code and checking that it matches the user’s local site page.



- You just need to remember to put the template tag there, you don't need to worry about the background.
- Now that we can show the form, let's discuss how to actually handle the form in a view!



- Right now if we hit submit, nothing will happen.
- We need to inform the view that if we get a POST back, we should check if the data is valid and if so, grab that data.



- We can do this by editing the view.
- We will talk a lot more about form validation later on, but upon receiving a validated form, we can access a dictionary like attribute of the “cleaned_data”.



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```
def form_name_view(request):  
    form = forms.FormName()  
  
    # Check to see if we get a POST back.  
    if request.method == 'POST':  
        # In which case we pass in that request.  
        form = forms.FormName(request.POST)  
  
    # Check to see form is valid  
    if form.is_valid():  
        # Do something.  
        print("Form Validation Success. Prints in console.")  
        print("Name"+form.cleaned_data['name'])  
        print("Email"+form.cleaned_data['email'])  
        print('Text'+form.cleaned_data['text'])  
    return render(request, 'basicapp/form_page.html', {'form': form})
```



- Alright, we still have more topics to cover, like customizing form validation and connecting forms to a model!
- Let's get some practice with what we know so far and create a basic form project and application from scratch!



- Once we've done that, we'll revisit our original `first_project` and see how we can add a form that connects to a model!
- Let's get started!



Form Basics Code Along

Django Level Three



Form Validation

Django Level Three



- In this lecture we will discuss hidden fields and how we can use them for custom field validation.
- The way our form is set up right now is pretty open to not only users, but potential “bots”.



- Django has built-in validators you can conveniently use to validate your forms (or check for bots!)
- Everything we do here will be limited to the forms.py file, so we'll jump right into coding it all out!

- We'll use the basicapp from the previous lecture and work with the following:
 - Adding a check for empty fields
 - Adding a check for a “bot”
 - Adding a clean method for the entire form.



Let's get started!

Django Level Three



Model Forms

Django Level Three



- We've seen how we can use Django Forms to grab information from the user and then do something with it.
- So far we've only printed out that information, but what if we wanted to save it to a model?



- Luckily Django makes accepting form input and passing it to a model very simple!
- Instead of inheriting from the `forms.Forms` class, we will use `forms.ModelForm` in our `forms.py` file.



- This helper class allows us to create a form from a pre-existing model
- We then add an inline class (something we haven't seen before) called Meta
- This Meta class provides information connecting the model to the form.



- Let's see some example code of what this new type of ModelForm class would look like.



- Example:

```
from django import forms
from myapp.models import MyModel
class MyNewForm(forms.ModelForm):
    # Form Fields go here
    class Meta:
        model = MyModel
        fields = # Let's see the options!
```



- The fields attribute will connect to model

```
from django import forms
from myapp.models import MyModel
class MyNewForm(forms.ModelForm):
    # Form Fields go here
    class Meta:
        model = MyModel
        fields = # Let's see the options!
```




- Many ways to make this connection!

```
from django import forms
from myapp.models import MyModel
class MyNewForm(forms.ModelForm):
    # Form Fields go here
    class Meta:
        model = MyModel
        fields = # Let's see the options!
```



- Need to think about security for fields!

```
from django import forms
from myapp.models import MyModel
class MyNewForm(forms.ModelForm):
    # Form Fields go here
    class Meta:
        model = MyModel
        fields = # Let's see the options!
```



- Very common to just use this:

```
from django import forms
from myapp.models import MyModel
class MyNewForm(forms.ModelForm):
    class Meta:
        model = MyModel
        fields = # Let's see the options!
```



- Have the form be generated from model

```
from django import forms
from myapp.models import MyModel
class MyNewForm(forms.ModelForm):
    class Meta:
        model = MyModel
        fields = # Let's see the options!
```



- This saves you work!

```
from django import forms
from myapp.models import MyModel
class MyNewForm(forms.ModelForm):
    class Meta:
        model = MyModel
        fields = # Let's see the options!
```



- But if you want custom validators...

```
from django import forms
from myapp.models import MyModel
class MyNewForm(forms.ModelForm):
    class Meta:
        model = MyModel
        fields = # Let's see the options!
```



- But if you want custom validators...

```
from django import forms
from myapp.models import MyModel
class MyNewForm(forms.ModelForm):
    # Form Fields go here with validators params
    class Meta:
        model = MyModel
        fields = # Let's see the options!
```



- Option #1: Set it to “__all__”

```
from django import forms
from myapp.models import MyModel
class MyNewForm(forms.ModelForm):
    # Form Fields go here
    class Meta:
        model = MyModel
        fields = “__all__”
```




- Option #2: exclude certain fields

```
from django import forms
from myapp.models import MyModel
class MyNewForm(forms.ModelForm):
    # Form Fields go here
    class Meta:
        model = MyModel
        exclude = ["field1", "field2"]
```



- Option #3: List included fields

```
from django import forms
from myapp.models import MyModel
class MyNewForm(forms.ModelForm):
    # Form Fields go here
    class Meta:
        model = MyModel
        fields = ("field1", "field2")
```



- Check out the documentation for more discussion on connecting fields in the form to fields in the model.
- To get some practice with all of this, let's try adding a Model Form to our proTwo from Django Level Two!



- This project had a single User class in its models, we will connect it to a form allowing users to register their names and emails to the site.
- This logic could easily be used to create a simple Coming Soon Landing Page!



- To get started, make sure you have the ProTwo folder from the Django Level Two folder in the notes.
- To see the completed version of this, check the ProTwo folder in Django Level Three.



- Let's get started!



Model Forms - Exercise

Django Level Three



- We will work with the ProTwo project folder from Django Level Two.
- Originally the user.html file used template tagging to display a list of all users.



- We will change this to be a sign-up page.
- Connected to a `ModelForm`, the user will sign up on the user page and be taken back to the home page.
- A great exercise would be to try to do this on your own first!

- (Optional) Exercise Steps:
 - Create a ModelForm in forms.py
 - Connect the form in the template
 - Edit views.py to show the form
 - Figure out how to .save() the data
 - Verify the model is admin registered



- I highly encourage you to try it on your own! You will need to look at the documentation.
- Let's get started!