

Tutorial 3: Class-based Views

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We can also write our API views using class-based views, rather than function based views. As we'll see this is a powerful pattern that allows us to reuse common functionality, and helps us keep our code **DRY**.

Rewriting our API using class-based views

We'll start by rewriting the root view as a class-based view. All this involves is a little bit of refactoring of `views.py`.

```
from snippets.models import Snippet
from snippets.serializers import SnippetSerializer
from django.http import Http404
from rest_framework.views import APIView
from rest_framework.response import Response
from rest_framework import status

class SnippetList(APIView):
    """
    List all snippets, or create a new snippet.
    """
    def get(self, request, format=None):
        snippets = Snippet.objects.all()
        serializer = SnippetSerializer(snippets, many=True)
        return Response(serializer.data)

    def post(self, request, format=None):
        serializer = SnippetSerializer(data=request.data)
        if serializer.is_valid():
            serializer.save()
            return Response(serializer.data, status=status.HTTP_201_CREATED)
        return Response(serializer.errors, status=status.HTTP_400_BAD_REQUEST)
```

So far, so good. It looks pretty similar to the previous case, but we've got better separation between the different HTTP methods. We'll also need to update the instance view in `views.py`.

```
class SnippetDetail(APIView):
    """
    Retrieve, update or delete a snippet instance.
    """
    def get_object(self, pk):
        try:
            return Snippet.objects.get(pk=pk)
        except Snippet.DoesNotExist:
            raise Http404

    def get(self, request, pk, format=None):
        snippet = self.get_object(pk)
        serializer = SnippetSerializer(snippet)
        return Response(serializer.data)

    def put(self, request, pk, format=None):
        snippet = self.get_object(pk)
        serializer = SnippetSerializer(snippet, data=request.data)
        if serializer.is_valid():
            serializer.save()
            return Response(serializer.data)
        return Response(serializer.errors, status=status.HTTP_400_BAD_REQUEST)

    def delete(self, request, pk, format=None):
        snippet = self.get_object(pk)
        snippet.delete()
        return Response(status=status.HTTP_204_NO_CONTENT)
```

That's looking good. Again, it's still pretty similar to the function based view right now.

We'll also need to refactor our `snippets/urls.py` slightly now that we're using class-based views.

```
from django.urls import path
from rest_framework.urlpatterns import format_suffix_patterns
from snippets import views

urlpatterns = [
    path('snippets/', views.SnippetList.as_view()),
    path('snippets/<int:pk>/', views.SnippetDetail.as_view()),
]

urlpatterns = format_suffix_patterns(urlpatterns)
```

Okay, we're done. If you run the development server everything should be working just as before.

Using mixins

One of the big wins of using class-based views is that it allows us to easily compose reusable bits of behaviour.

The create/retrieve/update/delete operations that we've been using so far are going to be pretty similar for any model-backed API views we create. Those bits of common behaviour are implemented in REST framework's mixin classes.

Let's take a look at how we can compose the views by using the mixin classes. Here's our `views.py` module again.

```
from snippets.models import Snippet
from snippets.serializers import SnippetSerializer
from rest_framework import mixins
from rest_framework import generics

class SnippetList(mixins.ListModelMixin,
                  mixins.CreateModelMixin,
                  generics.GenericAPIView):
    queryset = Snippet.objects.all()
    serializer_class = SnippetSerializer

    def get(self, request, *args, **kwargs):
        return self.list(request, *args, **kwargs)

    def post(self, request, *args, **kwargs):
        return self.create(request, *args, **kwargs)
```

We'll take a moment to examine exactly what's happening here. We're building our view using `GenericAPIView`, and adding in `ListModelMixin` and `CreateModelMixin`.

The base class provides the core functionality, and the mixin classes provide the `.list()` and `.create()` actions. We're then explicitly binding the `get` and `post` methods to the appropriate actions. Simple enough stuff so far.

```
class SnippetDetail(mixins.RetrieveModelMixin,
                    mixins.UpdateModelMixin,
                    mixins.DestroyModelMixin,
                    generics.GenericAPIView):
    queryset = Snippet.objects.all()
    serializer_class = SnippetSerializer

    def get(self, request, *args, **kwargs):
        return self.retrieve(request, *args, **kwargs)
```

```
def put(self, request, *args, **kwargs):
    return self.update(request, *args, **kwargs)

def delete(self, request, *args, **kwargs):
    return self.destroy(request, *args, **kwargs)
```

Pretty similar. Again we're using the `GenericAPIView` class to provide the core functionality, and adding in mixins to provide the `.retrieve()`, `.update()` and `.destroy()` actions.

Using generic class-based views

Using the mixin classes we've rewritten the views to use slightly less code than before, but we can go one step further. REST framework provides a set of already mixed-in generic views that we can use to trim down our `views.py` module even more.

```
from snippets.models import Snippet
from snippets.serializers import SnippetSerializer
from rest_framework import generics

class SnippetList(generics.ListCreateAPIView):
    queryset = Snippet.objects.all()
    serializer_class = SnippetSerializer

class SnippetDetail(generics.RetrieveUpdateDestroyAPIView):
    queryset = Snippet.objects.all()
    serializer_class = SnippetSerializer
```

Wow, that's pretty concise. We've gotten a huge amount for free, and our code looks like good, clean, idiomatic Django.

Next we'll move onto [part 4 of the tutorial](#), where we'll take a look at how we can deal with authentication and permissions for our API.