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I'm a passionate software developer and researcher from Brazil, currently living in Finland. I write about Python, Django and Web Development on a weekly basis. Read more.

TUTORIAL

How to Implement CRUD Using Ajax and Json

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(Picture: https://www.pexels.com/photo/macbook-laptop-smartphone-apple-7358/)

Using Ajax to create asynchronous request to manipulate Django models is a very common use case. It can be used to provide an in line edit in a table, or create a new model instance without going back and forth in the website. It also bring some challenges, such as keeping the state of the objects consistent.

In case you are not familiar with the term CRUD, it stand for **C**reate **R**ead **U**pdate **D**elete.

Those are the basic operations we perform in the application entities. For the most part the Django Admin is all about CRUD.

This tutorial is compatible with Python 2.7 and 3.5, using Django 1.8, 1.9 or 1.10.

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Basic Configuration

For this tutorial we will be using jQuery to implement the Ajax requests. Feel free to use any other JavaScript framework (or to implement it using bare JavaScript). The concepts should remain the same.

Grab a copy of jQuery, either download it or refer to one of the many CDN options.

jquery.com/download/

I usually like to have a local copy, because sometimes I have to work off-line. Place the jQuery in the bottom of your base template:

base.html

```
{% load static %}<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1">
    <title>Bookstore - Simple is Better Than Complex</title>
    <link href="{% static 'css/bootstrap.min.css' %}" rel="stylesheet">
    <!--[if lt IE 9]>
      <script src="https://oss.maxcdn.com/html5shiv/3.7.3/html5shiv.min.js"></
      <script src="https://oss.maxcdn.com/respond/1.4.2/respond.min.js"></scr
    <![endif]-->
  </head>
  <body>
    {% include 'includes/header.html' %}
    <div class="container">
      {% block content %}
      {% endblock %}
    </div>
    <script src="{% static 'js/jquery-3.1.1.min.js' %}"></script>  <!-- JQUER
    <script src="{% static 'js/bootstrap.min.js' %}"></script>
    {% block javascript %}
    {% endblock %}
  </body>
</html>
```

I will be also using Bootstrap. It is not required but it provide a good base css and also some useful HTML components, such as a Modal and pretty tables.

Working Example

I will be working in a app called **books**. For the CRUD operations consider the following model:

models.py

```
class Book(models.Model):
    HARDCOVER = 1
    PAPERBACK = 2
    EBOOK = 3
    BOOK_TYPES = (
        (HARDCOVER, 'Hardcover'),
        (PAPERBACK, 'Paperback'),
        (EBOOK, 'E-book'),
    )
    title = models.CharField(max_length=50)
    publication_date = models.DateField(null=True)
    author = models.CharField(max_length=30, blank=True)
    price = models.DecimalField(max_digits=5, decimal_places=2)
    pages = models.IntegerField(blank=True, null=True)
    book_type = models.PositiveSmallIntegerField(choices=BOOK_TYPES)
```

Listing Books

Let's get started by listing all the book objects.

We need a route in the urlconf:

urls.py:

```
from django.conf.urls import url, include
from mysite.books import views

urlpatterns = [
    url(r'^books/$', views.book_list, name='book_list'),
]
```

A simple view to list all the books:

views.py

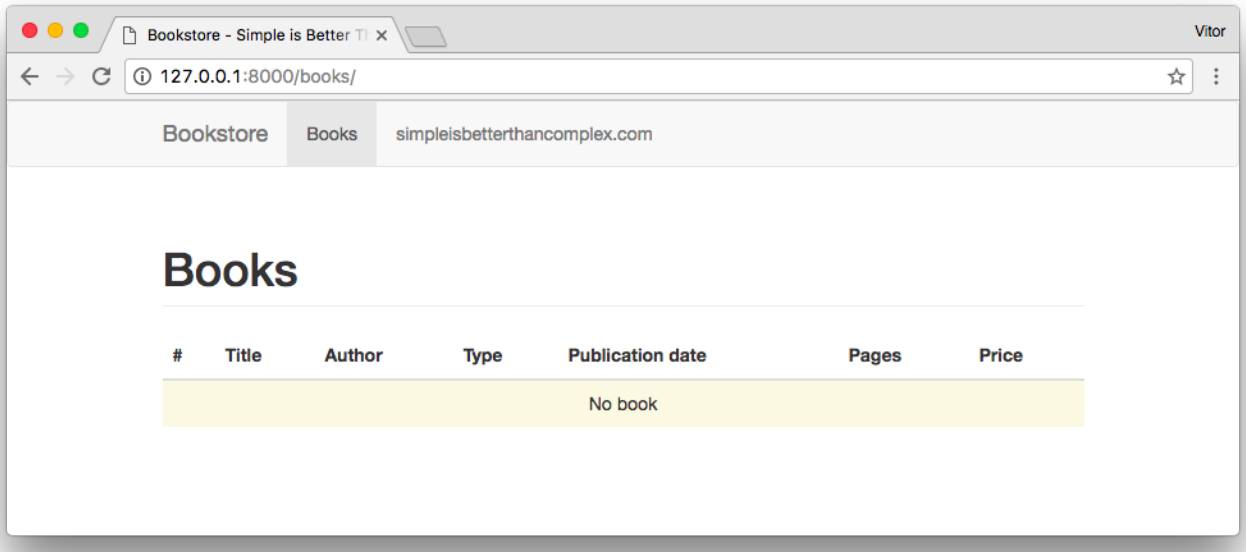
```
from django.shortcuts import render
from .models import Book

def book_list(request):
```

```
    books = Book.objects.all()
    return render(request, 'books/book_list.html', {'books': books})
```

book_list.html

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

{% block content %}
  <h1 class="page-header">Books</h1>
  <table class="table" id="book-table">
    <thead>
      <tr>
        <th>#</th>
        <th>Title</th>
        <th>Author</th>
        <th>Type</th>
        <th>Publication date</th>
        <th>Pages</th>
        <th>Price</th>
      </tr>
    </thead>
    <tbody>
      {% for book in book_list %}
        <tr>
          <td>{{ book.id }}</td>
          <td>{{ book.title }}</td>
          <td>{{ book.author }}</td>
          <td>{{ book.get_book_type_display }}</td>
          <td>{{ book.publication_date }}</td>
          <td>{{ book.pages }}</td>
          <td>{{ book.price }}</td>
        </tr>
      {% empty %}
        <tr>
          <td colspan="7" class="text-center bg-warning">No book</td>
        </tr>
      {% endfor %}
    </tbody>
  </table>
{% endblock %}
```

So far nothing special. Our template should look like this:



Create Book

First thing, let's create a model form. Let Django do its work.

forms.py

```
from django import forms
from .models import Book

class BookForm(forms.ModelForm):
    class Meta:
        model = Book
        fields = ('title', 'publication_date', 'author', 'price', 'pages', 'b
```

We need now to prepare the template to handle the creation operation. We will be working with partial templates to render only the parts that we actually need.

The strategy I like to use is to place a generic bootstrap modal, and use it for all the operations.

book_list.html

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

{% block content %}
  <h1 class="page-header">Books</h1>

  <!-- BUTTON TO TRIGGER THE ACTION -->
  <p>
    <button type="button" class="btn btn-primary js-create-book">
      <span class="glyphicon glyphicon-plus"></span>
      New book
    </button>
  </p>

  <table class="table" id="book-table">
    <!-- TABLE CONTENT SUPPRESSED FOR BREVITY'S SAKE -->
  </table>

  <!-- THE MODAL WE WILL BE USING -->
  <div class="modal fade" id="modal-book">
    <div class="modal-dialog">
      <div class="modal-content">
      </div>
    </div>
{% endblock %}
```

Note that I already added a **button** that will be used to start the creation process. I added a class **js-create-book** to hook the click event. I usually add a class starting with **js-** for all elements that interacts with JavaScript code. It's easier to debug the code later on. It's not a enforcement but just a convention. Helps the code quality.

Add a new route:

urls.py:

```
from django.conf.urls import url, include
from mysite.books import views

urlpatterns = [
    url(r'^books/$', views.book_list, name='book_list'),
    url(r'^books/create/$', views.book_create, name='book_create'),
]
```

Let's implement the **book_create** view:

views.py

```
from django.http import JsonResponse
from django.template.loader import render_to_string
from .forms import BookForm

def book_create(request):
    form = BookForm()
    context = {'form': form}
    html_form = render_to_string('books/includes/partial_book_create.html',
        context,
        request=request,
    )
    return JsonResponse({'html_form': html_form})
```

Note that we are not rendering a template but returning a Json response.

Now we create the partial template to render the form:

partial_book_create.html

```
{% load widget_tweaks %}

<form method="post">
  {% csrf_token %}
  <div class="modal-header">
    <button type="button" class="close" data-dismiss="modal" aria-label="Clos
      <span aria-hidden="true">&times;</span>
    </button>
    <h4 class="modal-title">Create a new book</h4>
  </div>
  <div class="modal-body">
    {% for field in form %}
      <div class="form-group{% if field.errors %} has-error{% endif %}">
        <label for="{{ field.id_for_label }}">{{ field.label }}</label>
        {% render_field field class="form-control" %}
        {% for error in field.errors %}
          <p class="help-block">{{ error }}</p>
        {% endfor %}
      </div>
    {% endfor %}
```

```
  </div>
  <div class="modal-footer">
    <button type="button" class="btn btn-default" data-dismiss="modal">Close</
    <button type="submit" class="btn btn-primary">Create book</button>
  </div>
</form>
```

I'm using the **django-widget-tweaks** library to render the form fields properly using the bootstrap class. You can read more about it in a post I published last year: Package of the Week: Django Widget Tweaks.

Now the glue that will put everything together: JavaScript.

Create an external JavaScript file. I created mine in the path: **mysite/books/static/books/js/books.js**

books.js

```
$(function () {

  $(".js-create-book").click(function () {
    $.ajax({
      url: '/books/create/',
      type: 'get',
      dataType: 'json',
      beforeSend: function () {
        $("#modal-book").modal("show");
      },
      success: function (data) {
        $("#modal-book .modal-content").html(data.html_form);
      }
    });
  });

});
```

Don't forget to include this JavaScript file in the **book_list.html** template:

book_list.html

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

{% load static %}

{% block javascript %}
  <script src="{% static 'books/js/books.js' %}"></script>
{% endblock %}

{% block content %}
  <!-- BLOCK CONTENT SUPPRESSED FOR BREVITY'S SAKE -->
{% endblock %}
```

Let's explore the JavaScript snippet in great detail:

This is a jQuery shortcut to tell the browser to wait for all the HTML be rendered before executing the code:

```
$(function () {
  ...
});
```

Here we are hooking into the click event of the element with class **js-create-book**, which is our Add book button.

```
$(".js-create-book").click(function () {
  ...
});
```

When the user clicks in the **js-create-book** button, this anonymous function with the **$.ajax** call will be executed:

```
$.ajax({
  url: '/books/create/',
  type: 'get',
  dataType: 'json',
  beforeSend: function () {
    $("#modal-book").modal("show");
  },
  success: function (data) {
    $("#modal-book .modal-content").html(data.html_form);
```

```
  }
});
```

Now, what is this ajax request saying to the browser:

Hey, the resource I want is in this path:

```
url: '/books/create/',
```

Make sure you request my data using the HTTP GET method:

```
type: 'get',
```

Oh, by the way, I want to receive the data in JSON format:

```
dataType: 'json',
```

But just before you communicate with the server, please execute this code:

```
beforeSend: function () {
  $("#modal-book").modal("show");
},
```

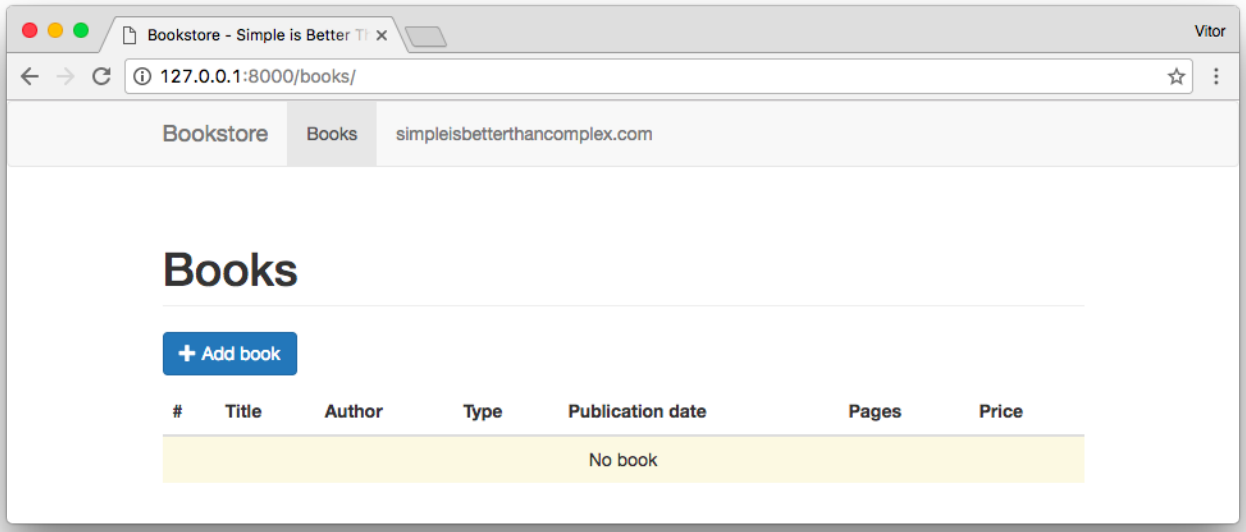
(This will open the Bootstrap Modal before the Ajax request starts.)

And right after you receive the data (in the data variable), execute this code:

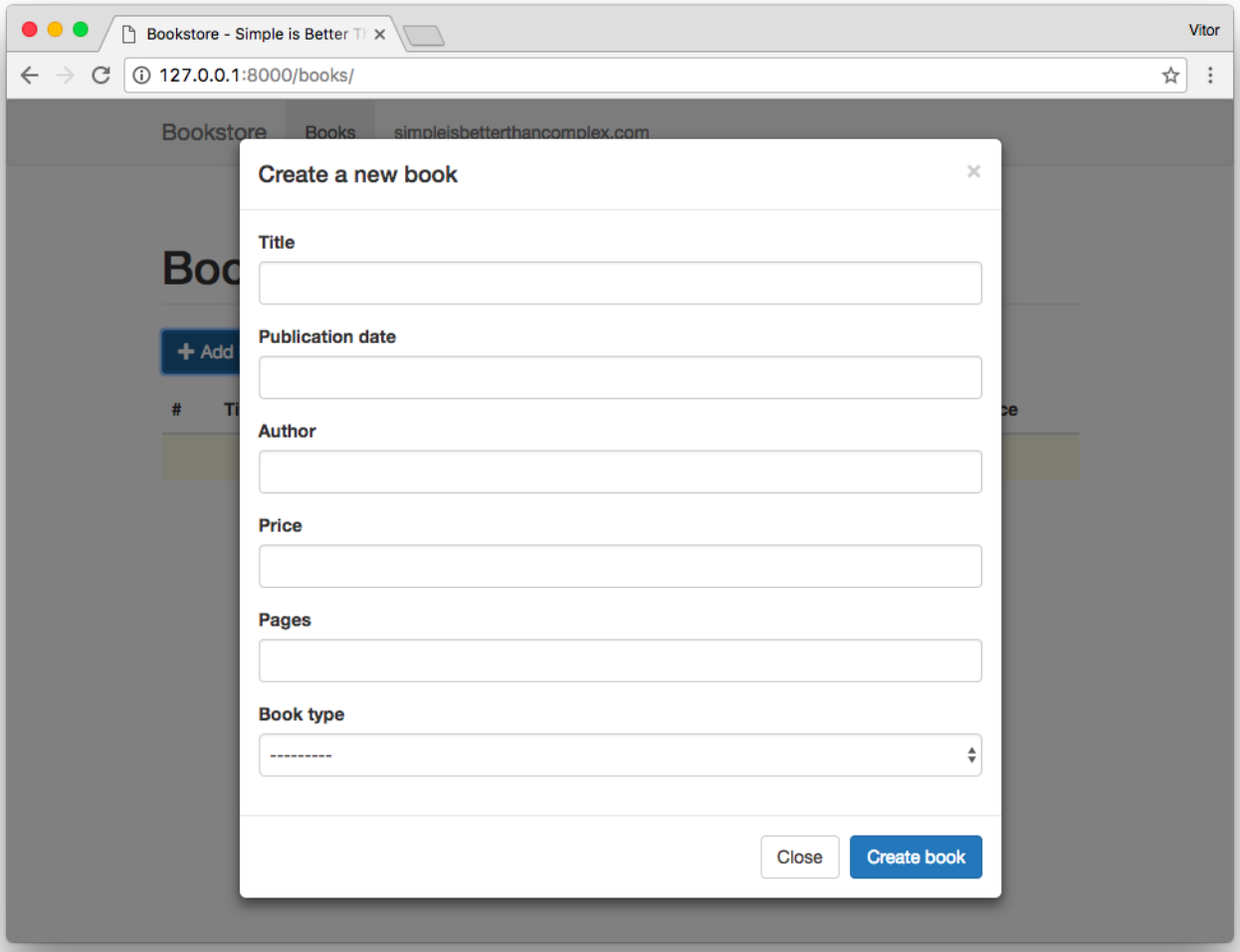
```
success: function (data) {
  $("#modal-book .modal-content").html(data.html_form);
}
```

(This will render the partial form defined in the **partial_book_create.html** template.)

Let's have a look on what we have so far:



Then when the user clicks the button:



Great stuff. The book form is being rendered asynchronously. But it is not doing much at the moment. Good news is that the structure is ready, now it is a matter of playing

with the data.

Let's implement now the form submission handling.

First let's improve the **book_create** view function:

views.py

```
def book_create(request):
    data = dict()

    if request.method == 'POST':
        form = BookForm(request.POST)
        if form.is_valid():
            form.save()
            data['form_is_valid'] = True
        else:
            data['form_is_valid'] = False
    else:
        form = BookForm()

    context = {'form': form}
    data['html_form'] = render_to_string('books/includes/partial_book_create.
        context,
        request=request
    )
    return JsonResponse(data)
```

partial_book_create.html

```
{% load widget_tweaks %}

<form method="post" action="{% url 'book_create' %}" class="js-book-create-fo
  <!-- FORM CONTENT SUPPRESSED FOR BREVITY'S SAKE -->
</form>
```

I added the **action** attribute to tell the browser to where it should send the submission and the class **js-book-create-form** for us to use in the JavaScript side, hooking on the form submit event.

books.js

```
$("#modal-book").on("submit", ".js-book-create-form", function () {
  ...
});
```

The way we are listening to the **submit** event is a little bit different from what we have implemented before. That's because the element with class **.js-book-create-form** didn't exist on the initial page load of the **book_list.html** template. So we can't register a listener to an element that doesn't exists.

A work around is to register the listener to an element that will always exist in the page context. The **#modal-book** is the closest element. It is a little bit more complex what happen, but long story short, the HTML events propagate to the parents elements until it reaches the end of the document.

Hooking to the **body** element would have the same effect, but it would be slightly worst, because it would have to travel through several HTML elements before reaching it. So always pick the closest one.

Now the actual function:

books.js

```
$("#modal-book").on("submit", ".js-book-create-form", function () {
  var form = $(this);
  $.ajax({
    url: form.attr("action"),
    data: form.serialize(),
    type: form.attr("method"),
    dataType: 'json',
    success: function (data) {
      if (data.form_is_valid) {
        alert("Book created!");  // <-- This is just a placeholder for now
      }
      else {
        $("#modal-book .modal-content").html(data.html_form);
      }
    }
  });
```

```
    return false;
  });
```

A very important detail here: in the end of the function we are returning **false**. That's because we are capturing the form submission event. So to avoid the browser to perform a full HTTP POST to the server, we cancel the default behavior returning false in the function.

So, what we are doing here:

```
var form = $(this);
```

In this context, `this` refers to the element with class `.js-book-create-form`. Which is the element that fired the submit event. So when we select `$(this)` we are selecting the actual form.

```
url: form.attr("action"),
```

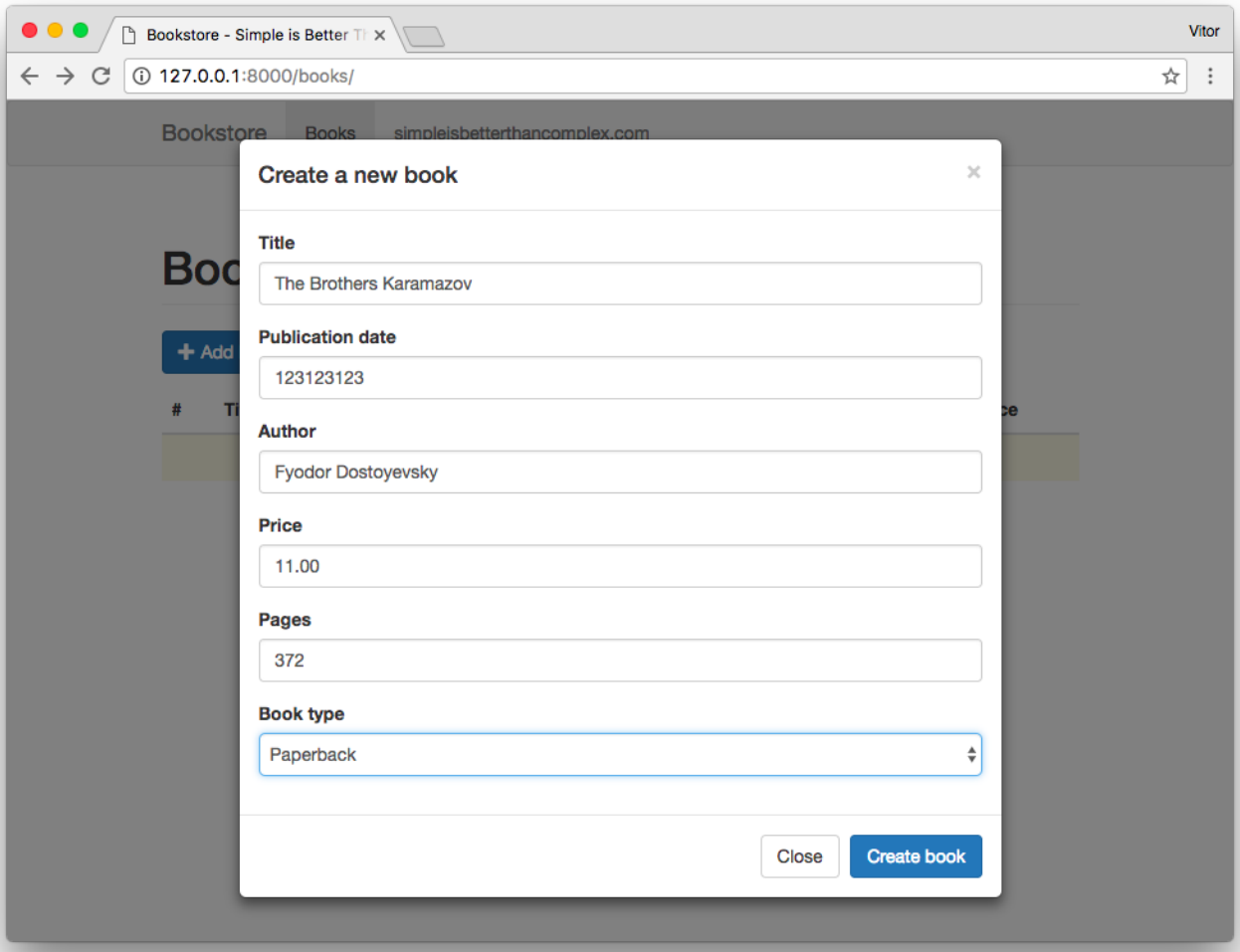
Now I'm using the form attributes to build the Ajax request. The **action** here refers to the **action** attribute in the **form**, which translates to `/books/create/`.

```
data: form.serialize(),
```

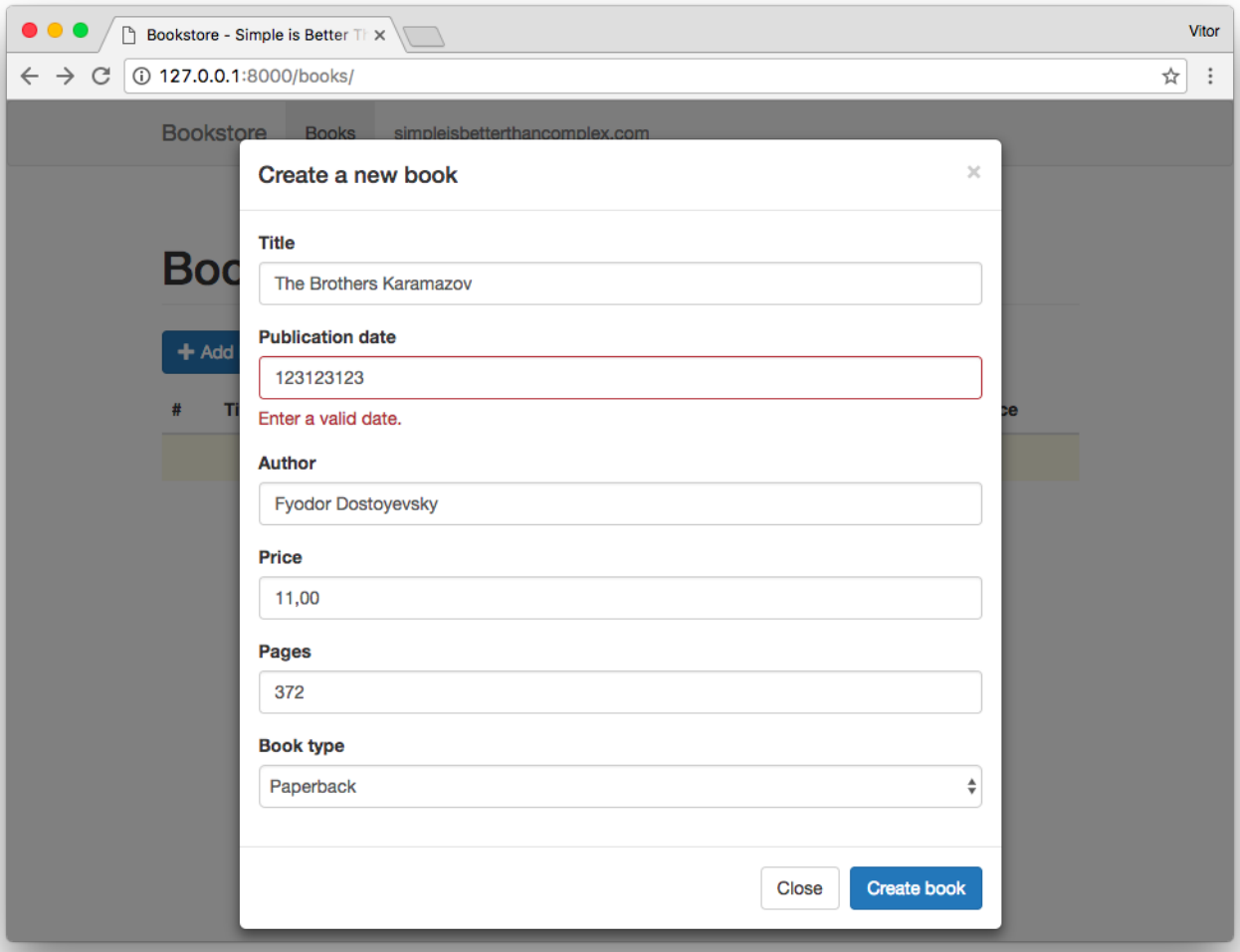
As the name suggests, we are serializing all the data from the form, and posting it to the server. The rest follows the same concepts as I explained before.

Before we move on, let's have a look on what we have so far.

The user fills the data:



The user clicks on the **Create book** button:



The data was invalid. No hard refresh no anything. Just this tiny part changed with the validation. This is what happened:

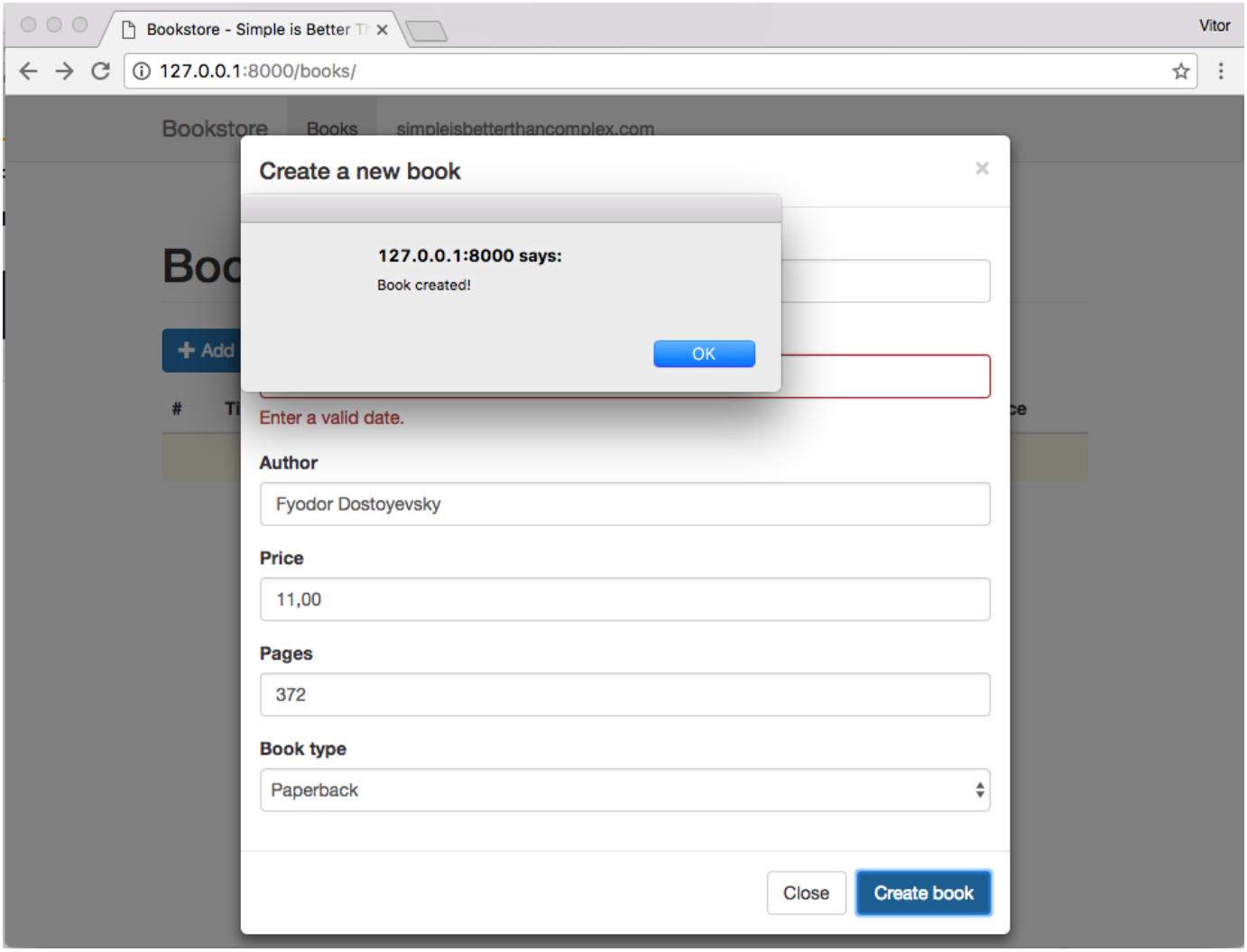
1. The form was submitted via Ajax
2. The view function processed the form
3. The form data was invalid
4. The view function rendered the invalid stated to the `data['html_form']`, using the **render_to_string**
5. The Ajax request returned to the JavaScript function
6. The Ajax **success** callback was executed, replacing the contents of the modal with the new `data['html_form']`

Please note that the Ajax **success** callback:

```
$.ajax({
  // ...
  success: function (data) {
    // ...
  }
});
```

Refers to the status of the **HTTP Request**, which has nothing to do with the status of your form, or whether the form was successfully processed or not. It only means that the **HTTP Request** returned a status **200** for example.

Let's fix the **publication date** value and submit the form again:

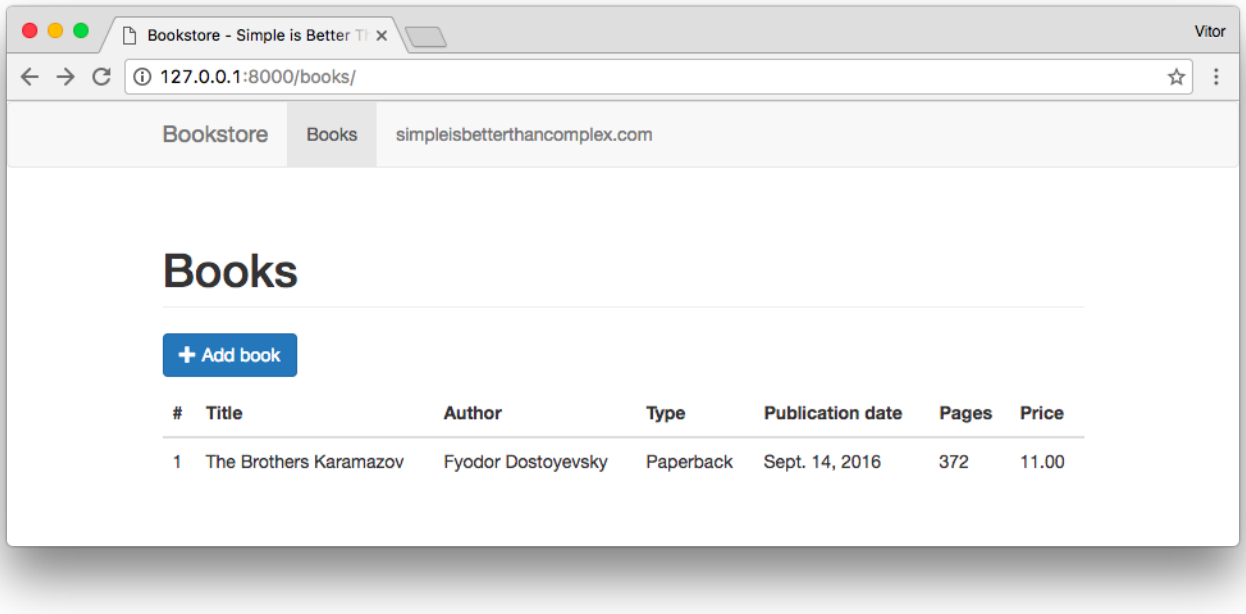


There we go, the **alert** tells us that the form was successfully processed and hopefully it was created in the database.

```
success: function (data) {
  if (data.form_is_valid) {
```

```
      alert("Book created!");  // <-- This line was executed! Means success
    }
    else {
      $("#modal-book .modal-content").html(data.html_form);
    }
  }
```

It is not 100% what we want, but we are getting close. Let's refresh the screen and see if the new book shows in the table:



Great. We are getting there.

What we want to do now: after the success form processing, we want to close the bootstrap modal *and* update the table with the newly created book. For that matter we will extract the body of the table to a external partial template, and we will return the new table body in the Ajax success callback.

Watch that:

book_list.html

```
<table class="table" id="book-table">
  <thead>
    <tr>
      <th>#</th>
      <th>Title</th>
```

```
      <th>Author</th>
      <th>Type</th>
      <th>Publication date</th>
      <th>Pages</th>
      <th>Price</th>
    </tr>
  </thead>
  <tbody>
    {% include 'books/includes/partial_book_list.html' %}
  </tbody>
</table>
```

partial_book_list.html

```
{% for book in books %}
  <tr>
    <td>{{ book.id }}</td>
    <td>{{ book.title }}</td>
    <td>{{ book.author }}</td>
    <td>{{ book.get_book_type_display }}</td>
    <td>{{ book.publication_date }}</td>
    <td>{{ book.pages }}</td>
    <td>{{ book.price }}</td>
  </tr>
{% empty %}
  <tr>
    <td colspan="7" class="text-center bg-warning">No book</td>
  </tr>
{% endfor %}
```

Now we can reuse the **partial_book_list.html** snippet without repeating ourselves.

Next step: **book_create** view function.

views.py

```
def book_create(request):
    data = dict()

    if request.method == 'POST':
        form = BookForm(request.POST)
        if form.is_valid():
            form.save()
```

```
            data['form_is_valid'] = True
            books = Book.objects.all()
            data['html_book_list'] = render_to_string('books/includes/partial_
                'books': books
            })
        else:
            data['form_is_valid'] = False
    else:
        form = BookForm()

    context = {'form': form}
    data['html_form'] = render_to_string('books/includes/partial_book_create.h
        context,
        request=request
    )
    return JsonResponse(data)
```

A proper success handler in the JavaScript side:

books.js

```
$("#modal-book").on("submit", ".js-book-create-form", function () {
  var form = $(this);
  $.ajax({
    url: form.attr("action"),
    data: form.serialize(),
    type: form.attr("method"),
    dataType: 'json',
    success: function (data) {
      if (data.form_is_valid) {
        $("#book-table tbody").html(data.html_book_list);  // <-- Replace th
        $("#modal-book").modal("hide");  // <-- Close the modal
      }
      else {
        $("#modal-book .modal-content").html(data.html_form);
      }
    }
  });
  return false;
});
```

Sweet. It's working!

Edit Book

As you can expect, this will be very similar to what we did on the Create Book section. Except we will need to pass the ID of the book we want to edit. The rest should be somewhat the same. We will be reusing several parts of the code.

urls.py:

```
from django.conf.urls import url, include
from mysite.books import views

urlpatterns = [
    url(r'^books/$', views.book_list, name='book_list'),
    url(r'^books/create/$', views.book_create, name='book_create'),
    url(r'^books/(?P<pk>\d+)/update/$', views.book_update, name='book_update'
]
```

Now we refactor the **book_create** view to reuse its code in the **book_update** view:

views.py

```
from django.shortcuts import render, get_object_or_404
from django.http import JsonResponse
from django.template.loader import render_to_string

from .models import Book
from .forms import BookForm


def save_book_form(request, form, template_name):
    data = dict()
    if request.method == 'POST':
        if form.is_valid():
            form.save()
            data['form_is_valid'] = True
            books = Book.objects.all()
            data['html_book_list'] = render_to_string('books/includes/partial_
                'books': books
            })
        else:
            data['form_is_valid'] = False
```

```
    context = {'form': form}
    data['html_form'] = render_to_string(template_name, context, request=requ
    return JsonResponse(data)


def book_create(request):
    if request.method == 'POST':
        form = BookForm(request.POST)
    else:
        form = BookForm()
    return save_book_form(request, form, 'books/includes/partial_book_create.

def book_update(request, pk):
    book = get_object_or_404(Book, pk=pk)
    if request.method == 'POST':
        form = BookForm(request.POST, instance=book)
    else:
        form = BookForm(instance=book)
    return save_book_form(request, form, 'books/includes/partial_book_update.
```

Basically the view functions **book_create** and **book_update** are responsible for receiving the request, preparing the form instance and passing it to the **save_book_form**, along with the name of the template to use in the rendering process.

Next step is to create the **partial_book_update.html** template. Similar to what we did with the view functions, we will also refactor the **partial_book_create.html** to reuse some of the code.

partial_book_form.html

```
{% load widget_tweaks %}

{% for field in form %}
  <div class="form-group{% if field.errors %} has-error{% endif %}">
    <label for="{{ field.id_for_label }}">{{ field.label }}</label>
    {% render_field field class="form-control" %}
    {% for error in field.errors %}
      <p class="help-block">{{ error }}</p>
    {% endfor %}
  </div>
{% endfor %}
```

partial_book_create.html

```
<form method="post" action="{% url 'book_create' %}" class="js-book-create-fo
  {% csrf_token %}
  <div class="modal-header">
    <button type="button" class="close" data-dismiss="modal" aria-label="Clos
      <span aria-hidden="true">&times;</span>
    </button>
    <h4 class="modal-title">Create a new book</h4>
  </div>
  <div class="modal-body">
    {% include 'books/includes/partial_book_form.html' %}
  </div>
  <div class="modal-footer">
    <button type="button" class="btn btn-default" data-dismiss="modal">Close</
    <button type="submit" class="btn btn-primary">Create book</button>
  </div>
</form>
```

partial_book_update.html

```
<form method="post" action="{% url 'book_update' form.instance.pk %}" class="
  {% csrf_token %}
  <div class="modal-header">
    <button type="button" class="close" data-dismiss="modal" aria-label="Clos
      <span aria-hidden="true">&times;</span>
    </button>
    <h4 class="modal-title">Update book</h4>
  </div>
  <div class="modal-body">
    {% include 'books/includes/partial_book_form.html' %}
  </div>
  <div class="modal-footer">
    <button type="button" class="btn btn-default" data-dismiss="modal">Close</
    <button type="submit" class="btn btn-primary">Update book</button>
  </div>
</form>
```

This is good enough. Now we gotta add an edit button to trigger the action.

partial_book_list.html

```
{% for book in books %}
  <tr>
    <td>{{ book.id }}</td>
    <td>{{ book.title }}</td>
    <td>{{ book.author }}</td>
    <td>{{ book.get_book_type_display }}</td>
    <td>{{ book.publication_date }}</td>
    <td>{{ book.pages }}</td>
    <td>{{ book.price }}</td>
    <td>
      <button type="button"
              class="btn btn-warning btn-sm js-update-book"
              data-url="{% url 'book_update' book.id %}">
        <span class="glyphicon glyphicon-pencil"></span> Edit
      </button>
    </td>
  </tr>
{% empty %}
  <tr>
    <td colspan="8" class="text-center bg-warning">No book</td>
  </tr>
{% endfor %}
```

The class **js-update-book** will be used to start the edit process. Now note that I also added an extra HTML attribute named **data-url**. This is the URL that will be used to create the ajax request dynamically.

Take the time and refactor the **js-create-book** button to also use the **data-url** strategy, so we can extract the hard-coded URL from the Ajax request.

book_list.html

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

{% block content %}
  <h1 class="page-header">Books</h1>

  <p>
    <button type="button"
            class="btn btn-primary js-create-book"
            data-url="{% url 'book_create' %}">
```

```
      <span class="glyphicon glyphicon-plus"></span>
      New book
    </button>
  </p>

  <!-- REST OF THE PAGE... -->

{% endblock %}
```

books.js

```
$(".js-create-book").click(function () {
  var btn = $(this);  // <-- HERE
  $.ajax({
    url: btn.attr("data-url"),  // <-- AND HERE
    type: 'get',
    dataType: 'json',
    beforeSend: function () {
      $("#modal-book").modal("show");
    },
    success: function (data) {
      $("#modal-book .modal-content").html(data.html_form);
    }
  });
});
```

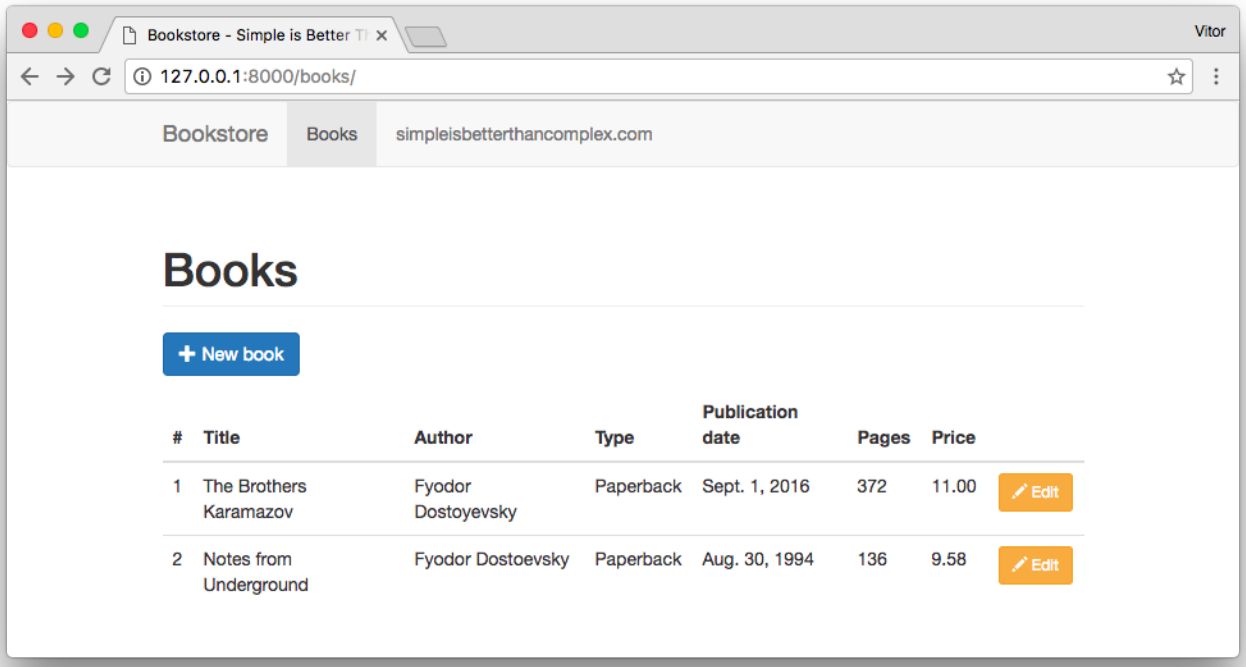
Next step is to create the edit functions. The thing is, they are pretty much the same as the create. So, basically what we want to do is to extract the anonymous functions that we are using, and reuse them in the edit buttons and forms. Check it out:

books.js

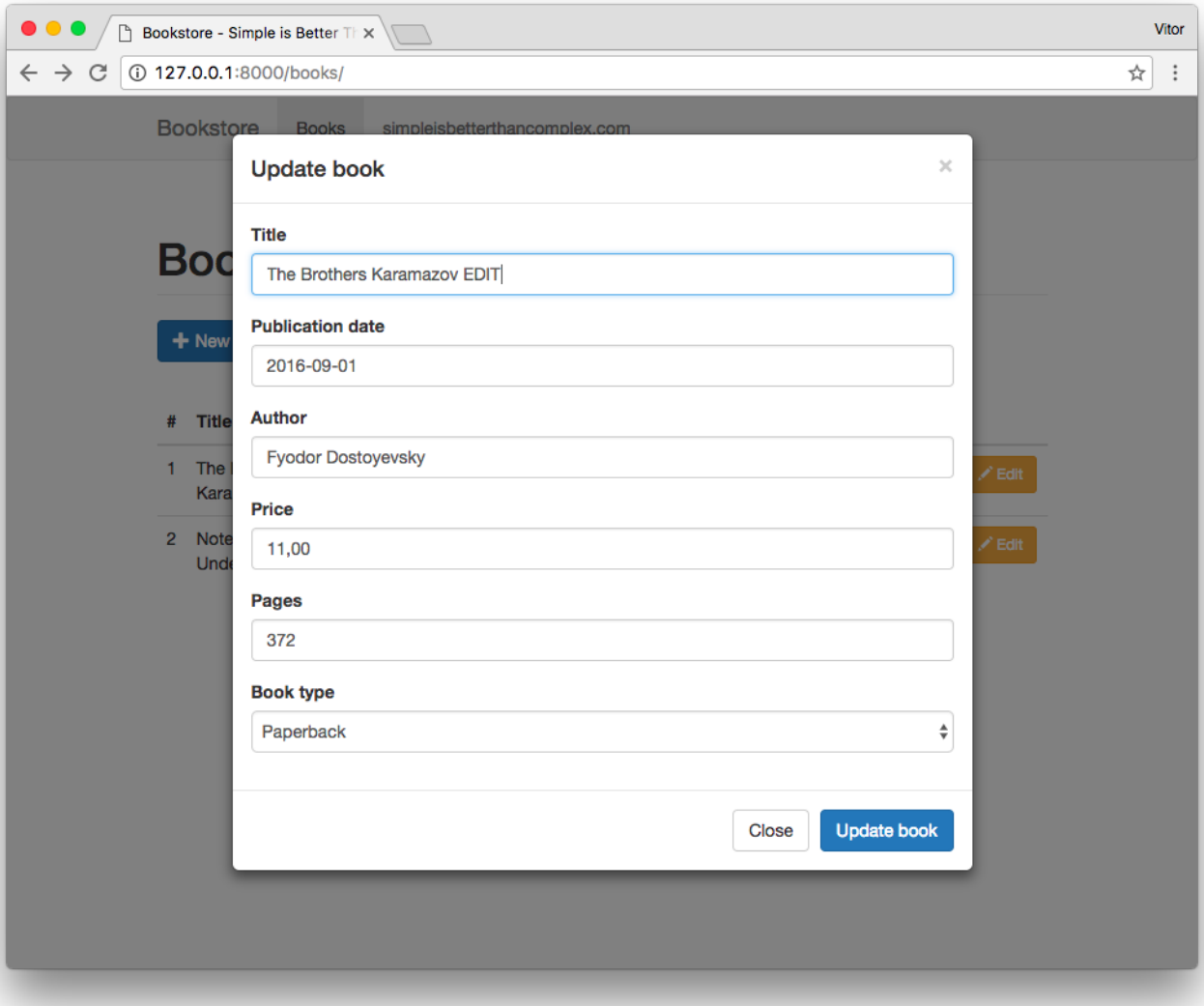
```
$(function () {

  /* Functions */

  var loadForm = function () {
    var btn = $(this);
    $.ajax({
      url: btn.attr("data-url"),
      type: 'get',
      dataType: 'json',
      beforeSend: function () {
```

```
        $("#modal-book").modal("show");
      },
      success: function (data) {
        $("#modal-book .modal-content").html(data.html_form);
      }
    });
  };

  var saveForm = function () {
    var form = $(this);
    $.ajax({
      url: form.attr("action"),
      data: form.serialize(),
      type: form.attr("method"),
      dataType: 'json',
      success: function (data) {
        if (data.form_is_valid) {
          $("#book-table tbody").html(data.html_book_list);
          $("#modal-book").modal("hide");
        }
        else {
          $("#modal-book .modal-content").html(data.html_form);
        }
      }
    });
    return false;
  };


  /* Binding */

  // Create book
  $(".js-create-book").click(loadForm);
  $("#modal-book").on("submit", ".js-book-create-form", saveForm);

  // Update book
  $("#book-table").on("click", ".js-update-book", loadForm);
  $("#modal-book").on("submit", ".js-book-update-form", saveForm);

});
```

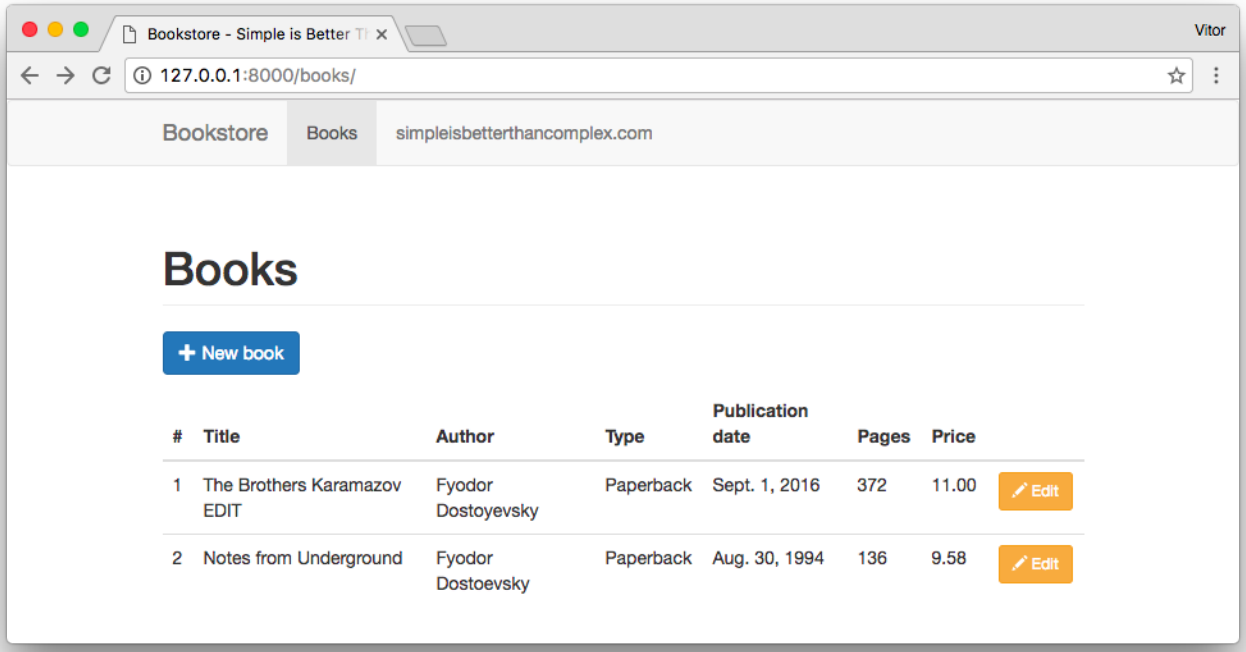
Let's have a look on what we have so far.



The user clicks in the edit button.



Changes some data like the title of the book and hit the **Update book** button:



Cool! Now just the delete and we are done.

Delete Book

urls.py:

```
from django.conf.urls import url, include
from mysite.books import views

urlpatterns = [
    url(r'^books/$', views.book_list, name='book_list'),
    url(r'^books/create/$', views.book_create, name='book_create'),
    url(r'^books/(?P<pk>\d+)/update/$', views.book_update, name='book_update'
    url(r'^books/(?P<pk>\d+)/delete/$', views.book_delete, name='book_delete'
]
```

views.py

```
def book_delete(request, pk):
    book = get_object_or_404(Book, pk=pk)
```

```
    data = dict()
    if request.method == 'POST':
        book.delete()
        data['form_is_valid'] = True  # This is just to play along with the ex
        books = Book.objects.all()
        data['html_book_list'] = render_to_string('books/includes/partial_book
            'books': books
        })
    else:
        context = {'book': book}
        data['html_form'] = render_to_string('books/includes/partial_book_dele
            context,
            request=request,
        )
    return JsonResponse(data)
```

partial_book_delete.html

```
<form method="post" action="{% url 'book_delete' book.id %}" class="js-book-de
  {% csrf_token %}
  <div class="modal-header">
    <button type="button" class="close" data-dismiss="modal" aria-label="Close
      <span aria-hidden="true">&times;</span>
    </button>
    <h4 class="modal-title">Confirm book deletion</h4>
  </div>
  <div class="modal-body">
    <p class="lead">Are you sure you want to delete the book <strong>{{ book.t
  </div>
  <div class="modal-footer">
    <button type="button" class="btn btn-default" data-dismiss="modal">Close</
    <button type="submit" class="btn btn-danger">Delete book</button>
  </div>
</form>
```

partial_book_list.html

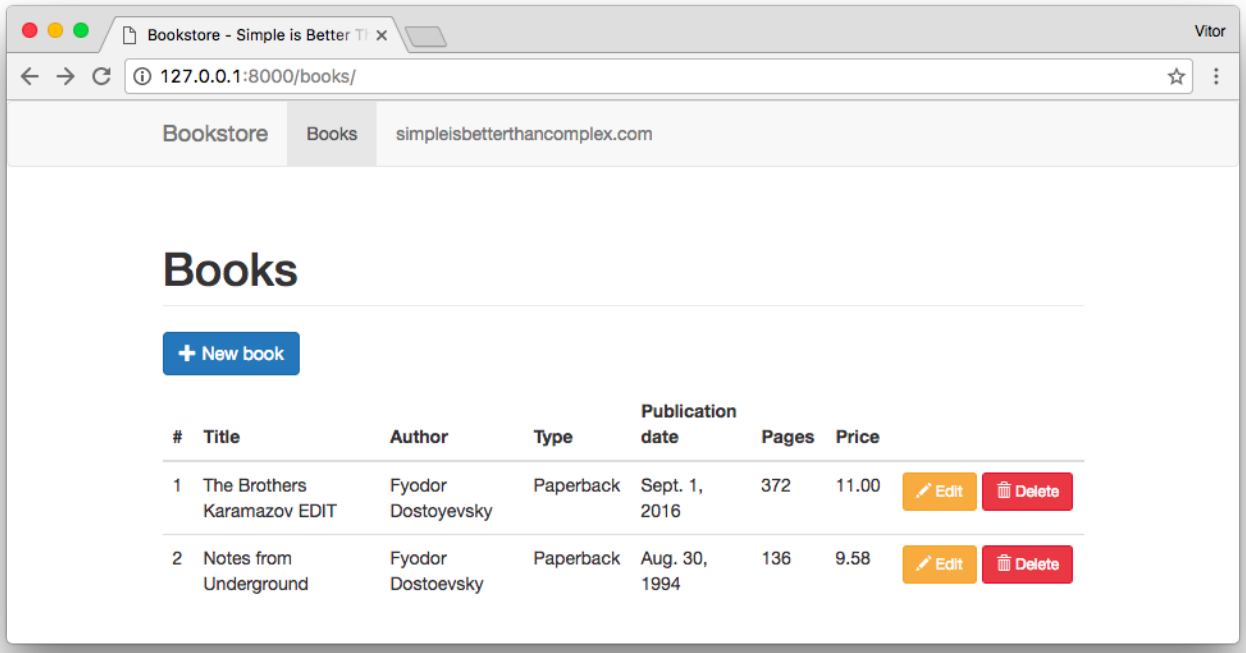
```
{% for book in books %}
  <tr>
    <td>{{ book.id }}</td>
    <td>{{ book.title }}</td>
    <td>{{ book.author }}</td>
    <td>{{ book.get_book_type_display }}</td>
```

```
    <td>{{ book.publication_date }}</td>
    <td>{{ book.pages }}</td>
    <td>{{ book.price }}</td>
    <td>
      <button type="button"
              class="btn btn-warning btn-sm js-update-book"
              data-url="{% url 'book_update' book.id %}">
        <span class="glyphicon glyphicon-pencil"></span> Edit
      </button>
      <button type="button"
              class="btn btn-danger btn-sm js-delete-book"
              data-url="{% url 'book_delete' book.id %}">
        <span class="glyphicon glyphicon-trash"></span> Delete
      </button>
    </td>
  </tr>
{% empty %}
  <tr>
    <td colspan="8" class="text-center bg-warning">No book</td>
  </tr>
{% endfor %}
```

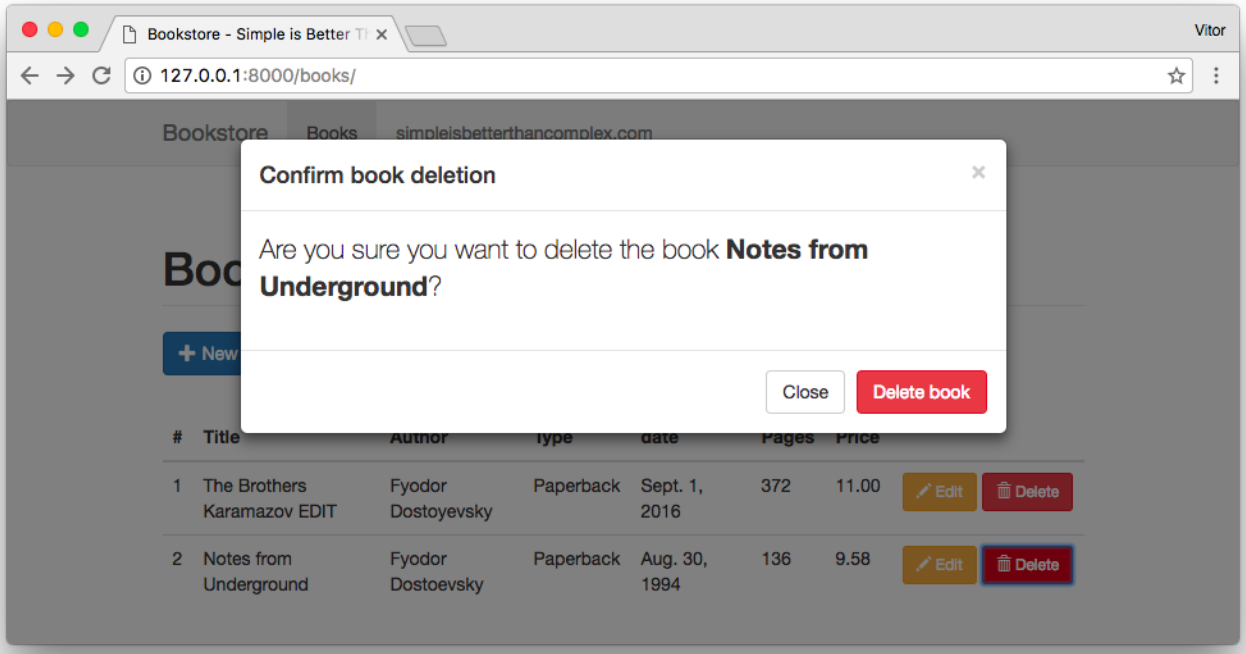
books.js

```
// Delete book
$("#book-table").on("click", ".js-delete-book", loadForm);
$("#modal-book").on("submit", ".js-book-delete-form", saveForm);
```

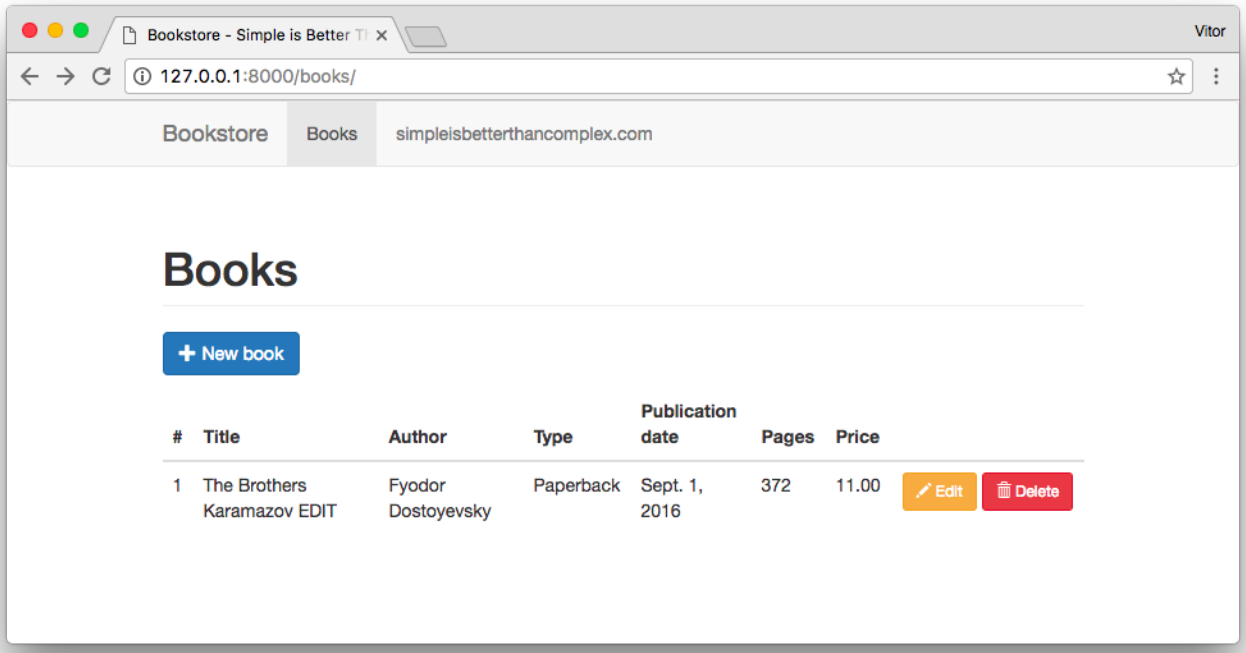
And the result will be:



The user clicks in a Delete button:



The user confirm the deletion, and the table in the background is refreshed:



Conclusions

I decided to use function-based views in this example because they are easier to read and use less configuration-magic that could distract those who are learning Django.

I tried to bring as much detail as I could and discuss about some of the code design decisions. If anything is not clear to you, or you want to suggest some improvements, feel free to leave a comment! I would love to hear your thoughts.

The code is available on GitHub: github.com/sibtc/simple-ajax-crud, so you can try it locally. It's very straightforward to get it running.

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django ajax crud jquery

Diego González Espinilla • a year ago

Hi Vitor.

How can I add a new button in the modal window that for example takes the value of the author field and when I press the button execute a function defined in the views.py that looks for the author and fill the field with the full name without closing the modal modal?

Thank you

6 ^ v • Reply • Share ›

miraj naik • a year ago

thanks ...but i am trying to create form but its not appear

<label for="{{ field.id_for_label }}">{{ field.label }}</label>
its showing error

6 ^ v • Reply • Share ›

Oskar Gmerek • 7 months ago

I do everything step by step from your tutorial but when i click on New book button I dont getting form in modal, modal is showing totally empty. In firebug I can see completed xhr get request. In this xhr request I can see me form. But without firebug I can see only empty modal (not empty form - no form and no other data is in this modal) What I can do wrong? I using python 3.5.2, django 1.11.2, jquery 3.2.1, bootstrap 3.3.7

Please help me ;)

4 ^ v • Reply • Share ›

Samuel Martins ➚ Oskar Gmerek • 4 months ago

I have the same problem here.

1 ^ v • Reply • Share ›

Kevin Arturo Ramirez Zavalza ➚ Oskar Gmerek • 4 months ago

When you open the modal it makes the request and should get a response with the render_to_string template so maybe it's not returning the html template from render_to_string and that's why it's empty,

^ v • Reply • Share ›

Jan Wilmar • a year ago

This is amazing! Thank you.

3 ^ v • Reply • Share ›

Vitor Freitas Mod ➚ Jan Wilmar • a year ago

Thanks Jan!

^ v • Reply • Share ›

Fabrice Damien Mbamba • 2 months ago

Hello Vitor, my name is Mbamba Fabrice Damien and I am a developer and very fan of your blog even if for now you do not offer us a tutorial on the use of efficient and flexible open source socket with django. I rather have a concern about your current tutorial on CRUD with ajax on modal. In fact everything works correctly except that when the modal is hidden the

item is saved in database but you have to refresh the page because the button does not work again if i push it to add another. Please help what i dismiss ?

2 • Reply • Share ›

iMitwe • a year ago

Thanks very much. it's awesome. and neat.

2 • Reply • Share ›

Vitor Freitas Mod ➚ iMitwe • a year ago

Thanks!!

• Reply • Share ›

Marcelo Grebois • a year ago

Hi Victor, first of I would like to thank you for this awesome tutorial, its amazing.

Now I have a couple of newbie questions, hope they don't so very stupid:

1) I know you use json to interact with the modals, is there any advantages using this approach against the standard class-views and then loading the full form ?

I was already able to set up a very similar CRUD using class views and the views.py look far more simpler, although the templates might not.

2) I tried to modify the form to have autocomplete in some fields, but the widget does not get loaded, although if I change the template to render as {{ form|crispy }}, then it shows just fine, any idea what I might be missing?

```
class BookForm(forms.ModelForm):
    class Meta:
        model = Book
        fields = ('__all__')
        exclude = ('user',)
        widgets = {
            'city': autocomplete.ModelSelect2(url='city')
        }
```

3) When I access /books, book_list.html get render perfectly:

```
def book_list(request):
    books = book.objects.all().filter(user=request.user)
    return render(request, 'books/book_list.html', {'books': books})
```

but as soon as I try to include this on the main page, it does not get render:

```
{% include 'books/book_list.html' %}
```

If I add a book the list appear, but then as soon as I refresh its gone again.

1 • Reply • Share ›

Vitor Freitas Mod ➚ Marcelo Grebois • a year ago

Hey Marcelo!
Thanks for your comment :-)

1) The main reason to work with the Json responses is to have more control over the data we return to the client and control the behavior inside the Ajax function, displaying the form inside the modal with error state, checking either if the form was valid or not

refreshing the table with the new entry and so on. This could also be achieved with normal HttpResponse or even simply using `return render(request, 'template_name.html')` etc. But then the return would simply be a string, so inside the Ajax function, a possible handler would be:

```
success: function (data) {
    $("#book-table tbody").html(data);  // instead of data.html_book_list
    $("#modal-book").modal("hide");
}
```

But then again, it would be tricky to test if the form was properly processed.

Now you can still use a class-based views returning JsonResponse. So you would have both: view classes + json.

see more

1 • Reply • Share ›

Marcelo Grebois ➚ Vitor Freitas • a year ago

Hey man, many thanks for taking the time and getting back to me this soon. I wasn't able to make the autocomplete widget work by assigning it within the Meta class, so I move forward and finished it with class-views.

Now for the last issue I really cannot find whats wrong, I removed the user filter just to make sure but still, this url will show me the list of 'trips' in my case:

/trips -> trip_list.html

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

{% block content %}
    {% include 'trips/trip_list_base.html' %}
{% endblock %}
```

but this url will not show any result:

/ -> home.html

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

{% block content %}
<div class="col-sm-5">
    <div class="row">
        <div class="col-sm-12">
            {% include 'trips/trip_list_base.html' %}
        </div>
    </div>
</div>
{% endblock %}
```

I uploaded a full example, maybe you could take a quick look:
https://github.com/grebois/...
Many Thanks!

• Reply • Share ›

Marcelo Grebois ➚ Marcelo Grebois • a year ago

I was able to make it work :) wants rendering the right tags :/ Thank you so much for this articule.

• Reply • Share ›

Vitor Freitas Mod ➚ Marcelo Grebois • a year ago

Sorry I couldn't check this earlier!
I'm glad to hear to figured out and made it work :-)

^ v • Reply • Share ›

Ruben Musalia • a year ago

Definitely trying this out tomorrow morning God willing as an exercise .Thank you.

1 ^ v • Reply • Share ›

Vitor Freitas Mod ➚ Ruben Musalia • a year ago

Nice one!
Let me know if you need any help :-)

^ v • Reply • Share ›

Ruben Musalia ➚ Vitor Freitas • a year ago

I'm getting this AttibuteError.

see more

^ v • Reply • Share ›

Vitor Freitas Mod ➚ Ruben Musalia • a year ago

Hi Ruben,

This error happened because you are using Django 1.9

I will fix the article to be compatible with earlier versions as well.

Basically you need to change the parameters in the **render_to_string** function:

data['html_form'] =
render_to_string('books/includes/partial_book_create.html', context,

request=request)

Basically everywhere you are using **render_to_string** and you see a **request** parameter, add it as a keyword argument like this **request=request**.

It is happening because it was changed in the 1.8 version, and in the 1.10 they dropped the backwards compatibility.

Reply • Share ›

Travis • 3 days ago

Wow,
your post save my whole day,
much thanks bro!

Reply • Share ›

tigers2020 • 5 days ago

there is error with form.serialize() that if I use <input type="file">. file doesn't upload to request.FILES as MultiValueDict. even put enctype="multipart/form-data" in the <form> and as try tweak use form.get(0).serialize() it upload file but it redirect to upload json url as image shows.
https://prnt.sc/ihs07e

Reply • Share ›

ian wanderson • 10 days ago

when editing the book as I put the date in dd/mm/yy format

Reply • Share ›

Carlos E Velez • 11 days ago

Very good your article but why I try to implement their ideas as it does and does not work gives me the following erro
AttributeError at / contacto_create /
El objeto 'WSGIRequest' no tiene atributo 'push'

Reply • Share ›

Camilo Andrés • a month ago

Nice tutorial! I was wondering, is there a way to do it without making so many files? I mean, without using the include function from django.
Thanks.

Reply • Share ›

souravbj • a month ago

Awesome tutorial, can you please describe the changes to change it with class based view.

Reply • Share ›

Camilo Escobar • a month ago

I can't manage to retrieve the data from partial_book_create.html to the modal with the books.js resulting in the modal displaying empty.
I think it's the sucess:function part that isn't working cause i tried putting some alerts to check if the code got there but it hasn't

if the code got there but it hasn't.
I'm also getting this error :"TypeError: sequence item 7: expected str instance, BoundField found" which i googled but found nothing yet.

Any help would be really appreciated.

Reply • Share ›

Kristijonas Impolevičius ➚ Camilo Escobar • a month ago

I think that is because You are using Django 2.0. (Django (2.0.1)). I get the same error. Try to downgrade the Django version to 1.11.9.
Paul Phillips menthions that it can be run with bootstrap 4.0. But I was not able to make it work.

Reply • Share ›

Paul Phillips • a month ago

I have this concept working beautifully in my Django 2.0 application using bootstrap 4.0. I just wanted to say thank you for putting the time in to this. I found this a great tutorial to follow, very well laid out and easy to follow.
Thanks
Paul

Reply • Share ›

Pape Ibrahima Diawara • 2 months ago

@Vitor Freitas render_field does not work with Django 2.0

Reply • Share ›

Rostan Soriano Borja • 2 months ago

Hello Vitor, thanks for share your knowledge with the others. I'm new on Django, and for some reason, I'm trying to do this with MaterilizeCss instead Bootstrap, so, I'm stuck in the call to "partial_book_create.html" like a modal, the first time, when I call my function (similar at your "book_create") what return a "JsonResponse", I get all my html like a error with the next phrase "is not JSON serializable".

• Reply • Share ›

Devy Freshia • 2 months ago

Amazing! A really clear explanation. Thank you so much!

• Reply • Share ›

Dmitry Sintsov • 2 months ago

CRUD based on class-based views provides an easier way to implement new custom actions and to inherit / extend datatables from the base class views. It also allows to share the parts of traditional HTML datatable view and AJAX datatable view:
https://github.com/Dmitri-S...

• Reply • Share ›

Фе́ликс Эдму́ндович Дзержи́нск • 2 months ago

I tried to add a File field following this system but it does me a weird thing: it creates me a text field like and inside that textfield it puts me the Upload button. So the button selects and writes the name of the chosen file but actually it is not detected by the POST method and it never gets sent. So, this loop that you make "for each field form" etc is fine if all of them are standard fields, but it won't work with File. I also checked your tutorial on File Upload, but there you follow a different method that diverts from this one, so I would not get the error checking as you are doing here.

• Reply • Share ›

Drew Navy • 3 months ago

Thanks, very clear and usefull!

• Reply • Share ›

Фе́ликс Эдму́ндович Дзержи́нск • 3 months ago

This is very difficult to follow because it is all messy. A sitemap should have been provided upfront before starting, in order to make clear where each file goes and is located.

• Reply • Share ›

Vitor Freitas Mod → Фе́ликс Эдму́ндович Дзержи́нск • 3 months ago

Hi buddy! Sorry about that, and thanks for the feedback!
I will try to improve the writing by making it clear where to place the files.

Meanwhile, if you want to give it another shot, try following the text using the github repository as guidance:
https://github.com/sibtc/si...

There you can see where exactly each file was saved

• Reply • Share ›

Фе́ликс Эдму́ндович Дзержи́нск → Vitor Freitas • 3 months ago

ok, thank you, I ll look in there as I have spent 2 days trying to put all this together and still cant find the Add Book button to show.

• Reply • Share ›

Udit Hari Vashisht • 3 months ago

Hi, I have just cloned the whole application from the github website and tried to run the same on my computer, but I am not getting any pop up on clicking add books or edit or delete button. I am using django 1.11.7

Reply • Share ›

Kevin Arturo Ramirez Zavalza • 4 months ago

Thanks for writting this tutorial, it works great. I made some changes and I think that if you are going to use data attributes, several changes can be made, first, you could use only one view to create, edit or delete an object, just pass a data-action="create", data-action="edit" or data-action="delete" and pass the object id in a data-id attribute instead of using an url argument, then you send this values in GET or POST, if it's GET you render the form to create or edit based on data-action, if you POST, you save your changes or delete the object also based in data-action attribute. With that changes I only use two views, one to list the objects and the other to create, update or delete and almost the same quantity of javascript.

Reply • Share ›

Udit Hari Vashisht ➚ Kevin Arturo Ramirez Zavalza • 3 months ago

can u elaborate it by posting the codes?

Reply • Share ›

Abdul Aris • 4 months ago

It's great. Thank you.

Reply • Share ›

christian • 5 months ago

This tutorial is great. I'm trying to implement it but I am using a non-auto-generated primary key.

In my partial_item_list.html, for the update button I have:
data-url="{% url 'item_update' item.pk %}"

This breaks my app with the error:
NoReverseMatch at /items/
Reverse for 'item_update' with arguments '('12345-1',)' and keyword arguments '{}' not found. 1 pattern(s) tried: [items/update/$']

Removing the data-url causes the page to load normally.

any ideas?

Reply • Share ›

Kevin Arturo Ramirez Zavalza ➚ christian • 4 months ago

If you are going to pass the pk in the {% url %} you need to have the argument in your url.py, the error is happening because there is no match from your data-url with you url patterns, you should have something like this in urls.py:

url(r'^items/update/(?P<pk>\d+)/$', myview, name='myview_name'),

Reply • Share ›