



DJANGO ADMIN COOKBOOK

*How to do things
with Django admin*

**Updated for Django 2.0
and Python 3.6**

Django Admin Cookbook



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Django Admin Cookbook - How to do things with Django admin.

This is a book about doing things with Django admin. It takes the form of about forty questions and common tasks with Django admin we answer.

The chapters are based on a common set of models, which you can read in detail here ([Models used in this book](#)). In short, we have two apps, events and entities. The models are

- Events: Epic, Event, EventHero, EventVillian
- Entities: Category, Origin, Hero, Villain
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Introduction

Django Admin Cookbook is a book about doing things with Django admin. It is targeted towards intermediate Django developers, who have some experience with Django admin, but are looking to expand their knowledge of Django admin and achieve mastery of Django admin.

It takes the form of question and answers about common tasks you might do with Django admin. All the chapters are based on a common set of models, which you can read in detail here ([Models used in this book](#)). In short, we have two apps, events and entities. The models are

- Events: Epic, Event, EventHero, EventVillain
- Entities: Category, Origin, Hero, Villain

How to use this book

You can read this book either from start to end, or search for the things you need to do and only read those chapters. Each chapter focusses on a single, specific task.

In either case, you should read the `entities/models.py` and `events/models.py` first.

1. How to change “Django administration” text?

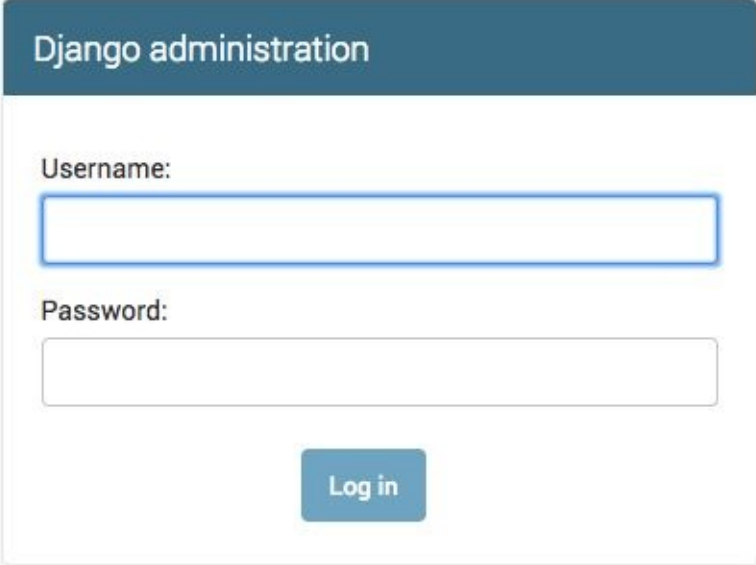
By default Django admin shows “Django administration”. You have been asked to replace this with “UMSRA Administration”

The text is at these pages:

- Login Page
- The listview page
- The HTML title tag

1.1. Login, Listview and Changeview Page

By default it looks like this and is set to “Django administration”



The image shows a screenshot of the Django administration login page. It features a dark blue header bar with the text "Django administration" in white. Below the header, there is a white form area. Inside the form, the label "Username:" is followed by a text input field. Below that, the label "Password:" is followed by another text input field. At the bottom of the form, there is a blue button with the text "Log in" in white.

site_header can be set to change this.

1.2. Listview Page

BY default it looks like this and is set to "Site administration"

Django administration		
Site administration		
AUTHENTICATION AND AUTHORIZATION		
Groups	+ Add	✎ Change
Users	+ Add	✎ Change
ENTITIES		
Categorys	+ Add	✎ Change
Heros	+ Add	✎ Change
Origins	+ Add	✎ Change
Villains	+ Add	✎ Change
EVENTS		
Epics	+ Add	✎ Change
Event heros	+ Add	✎ Change
Event villains	+ Add	✎ Change
Events	+ Add	✎ Change

index_title can be set to change this.

1.3. HTML title tag

By default it looks like this and is set to "Django site admin"



`site_title` can be set to change this.

We can make the three changes in `urls.py`:

```
admin.site.site_header = "UMSRA Admin"  
admin.site.site_title = "UMSRA Admin Portal"  
admin.site.index_title = "Welcome to UMSRA Researcher Portal"
```

2. How to set the plural text for a model?

By default admin will show the name of your model appended with an "s", aka the plural form of your model. It looks like this

Welcome to UMSRA Researcher Portal

AUTHENTICATION AND AUTHORIZATION		
Groups	+ Add	Change
Users	+ Add	Change
ENTITIES		
Categorys	+ Add	Change
Heros	+ Add	Change
Origins	+ Add	Change
Villains	+ Add	Change

You have been asked to set the correct plural spellings: *Categories* and *Heroes*

You can do this by setting the `verbose_name_plural` in your models. Change that in your `models.py`:

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

    class Meta:
        verbose_name_plural = "Categories"

class Hero(Entity):
    ...
```



```
class Meta:
    verbose_name_plural = "Heroes"
```

With the changes your Admin will look like this.

Welcome to UMSRA Researcher Portal

AUTHENTICATION AND AUTHORIZATION

Groups	+ Add	✎ Change
--------	-----------------------	--------------------------

Users	+ Add	✎ Change
-------	-----------------------	--------------------------

ENTITIES

Categories	+ Add	✎ Change
------------	-----------------------	--------------------------

Heroes	+ Add	✎ Change
--------	-----------------------	--------------------------

Origins	+ Add	✎ Change
---------	-----------------------	--------------------------

Villains	+ Add	✎ Change
----------	-----------------------	--------------------------

3. How to create two independent admin sites?

The usual way to create admin pages is to put all models in a single admin. However it is possible to have multiple admin sites in a single Django app.

Right now our entity and event models are in same place. UMSRA has two distinct group researching *Events* and *Entities*, and so wants to split the admins.

We will keep the default admin for *entities* and create a new subclass of AdminSite for *events*.

In our events/admin.py we do:

```
from django.contrib.admin import AdminSite
class EventAdminSite(AdminSite):
    site_header = "UMSRA Events Admin"
    site_title = "UMSRA Events Admin Portal"
    index_title = "Welcome to UMSRA Researcher Events Portal"

event_admin_site = EventAdminSite(name='event_admin')

event_admin_site.register(Epic)
event_admin_site.register(Event)
event_admin_site.register(EventHero)
event_admin_site.register(EventVillain)
```

And change the urls.py to

```
from events.admin import event_admin_site

urlpatterns = [
    path('entity-admin/', admin.site.urls),
    path('event-admin/', event_admin_site.urls),
]
```

This separates the admin. Both admins are available at their respective urls, *entity-admin* and *event-admin/*.

4. How to remove default apps from Django admin?

Django will include `django.contrib.auth` in `INSTALLED_APPS`, which means *User* and *Groups* models are included in admin automatically.

Welcome to UMSRA Researcher Portal

AUTHENTICATION AND AUTHORIZATION		
Groups	+ Add	✎ Change
Users	+ Add	✎ Change
ENTITIES		
Categories	+ Add	✎ Change
Heroes	+ Add	✎ Change
Origins	+ Add	✎ Change
Villains	+ Add	✎ Change

If you want to remove it, you will have to unregister them.

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

admin.site.unregister(User)
admin.site.unregister(Group)
```

After making these changes, your admin should look like this.

Welcome to UMSRA Researcher Portal

ENTITIES		
Categories	+ Add	✎ Change
Heroes	+ Add	✎ Change
Origins	+ Add	✎ Change
Villains	+ Add	✎ Change

5. How to add a logo to Django admin?

Your higher ups at UMSRA love the admin you have created till now, but marketing wants to put the UMSRA logo on all admin pages.

You need to override the default templates provided by Django. In your django settings, you code::*TEMPLATES* setting looks like this.

```
TEMPLATES = [
    {
        'BACKEND':
'django.template.backends.django.DjangoTemplates',
        'DIRS': [],
        'APP_DIRS': True,
        'OPTIONS': {
            'context_processors': [
                'django.template.context_processors.debug',
                'django.template.context_processors.request',
                'django.contrib.auth.context_processors.auth',

'django.contrib.messages.context_processors.messages',
            ],
        },
    ],
]
```

This means that Django will look for templates in a directory called templates inside each app, but you can override that by setting a value for `TEMPLATES.DIRS`.

We change the `'DIRS': []`, to `'DIRS': [os.path.join(BASE_DIR, 'templates/')]`, and create the templates folder. If your `STATICFILES_DIRS` is empty set it to:

```
STATICFILES_DIRS = [
    os.path.join(BASE_DIR, "static"),
]
```

Now copy the `base_site.html` from the admin app to `templates\admin` folder you just created. Replace the default text in *branding* block with:

```
<h1 id="site-name">
  <a href="{% url 'admin:index' %}">
    
  </a>
</h1>
```

With the changes your `base_site.html` will look like this:

```
{% extends "admin/base.html" %}

{% load staticfiles %}

{% block title %}{{ title }} | {{ site_title|default:_('Django site admin') }}{% endblock %}

{% block branding %}
<h1 id="site-name">
  <a href="{% url 'admin:index' %}">
    
  </a>
</h1>
{% endblock %}

{% block nav-global %}{% endblock %}
```

And your admin will look like this

Welcome to UMSRA Researcher Events Portal

EVENTS

Epics	+ Add	✎ Change
Event heros	+ Add	✎ Change
Event villains	+ Add	✎ Change
Events	+ Add	✎ Change

6. How to override Django admin templates?

<https://docs.djangoproject.com/en/dev/ref/contrib/admin/#overriding-admin-templates>

1. How to show calculated fields on listview page?

You have an admin for the `Origin` model like this:

```
@admin.register(Origin)
class OriginAdmin(admin.ModelAdmin):
    list_display = ("name",)
```

Apart from the name, we also want to show the number of heroes and number of villains for each origin, which is not a DB field on `Origin`. You can do this in two ways.

1.1. Adding a method to the model

You can add two methods to your `Origin` model like this:

```
def hero_count(self,):  
    return self.hero_set.count()  
  
def villain_count(self):  
    return self.villain_set.count()
```

And change `list_display` to `list_display = ("name", "hero_count", "villain_count")`.

1.2. Adding a method to the ModelAdmin

If you don't want to add method to the model, you can do instead add the method to the ModelAdmin.


```
def hero_count(self, obj):  
    return obj.hero_set.count()  
  
def villain_count(self, obj):  
    return obj.villain_set.count()
```

The `list_display`, as earlier, changes to `list_display = ("name", "hero_count", "villain_count")`.

1.3. Performance considerations for calculated_fields

With either of the above approaches, you would be running two extra queries per object (One per calculated field). You can find how to optimize this in [How to optimize queries in Django admin?](#).

With any of these changes your admin looks like this:

WELCOME, SHABDA.

Home › Entities › Origins

Select origin to change

Action: 0 of 3 selected

<input type="checkbox"/>	NAME	HERO COUNT	VILLAIN COUNT
<input type="checkbox"/>	Norse	0	0
<input type="checkbox"/>	Greece	1	0
<input type="checkbox"/>	India	2	1

3 origins

2. How to optimize queries in Django admin?

If you have a lot of calculated fields in your admin, you can be running multiple queries per object leading to your admin can becoming quite slow. To fix this you can override the `get_queryset` method on model admin to annotate the calculated fields.

Lets take the example of this `ModelAdmin` we have for `Origin`:

```
@admin.register(Origin)
class OriginAdmin(admin.ModelAdmin):
    list_display = ("name", "hero_count", "villain_count")

    def hero_count(self, obj):
        return obj.hero_set.count()

    def villain_count(self, obj):
        return obj.villain_set.count()
```

This adds two extra queries per row in your listview page. To fix this you can override the `get_queryset` to annotate the counted fields, and then use the annotated fields in your `ModelAdmin` methods.

With the changes, your `ModelAdmin` field looks like this:


```
@admin.register(Origin)
class OriginAdmin(admin.ModelAdmin):
    list_display = ("name", "hero_count", "villain_count")

    def get_queryset(self, request):
        queryset = super().get_queryset(request)
        queryset = queryset.annotate(
            herocount=Count("hero", distinct=True),
            villaincount=Count("villain", distinct=True),
        )
        return queryset

    def hero_count(self, obj):
        return obj.herocount
```

```
def villain_count(self, obj):  
    return obj.villaincount
```

There are no per object extra queries. Your admin continues to look like it did before the annotate call.

WELCOME, SHABDA.

Home › Entities › Origins

Select origin to change

Action: 0 of 3 selected

<input type="checkbox"/>	NAME	HERO COUNT	VILLAIN COUNT
<input type="checkbox"/>	Norse	0	0
<input type="checkbox"/>	Greece	1	0
<input type="checkbox"/>	India	2	1

3 origins

3. How to enable sorting on calculated fields?

Django adds sorting capabilities on fields which are attributes on the models. When you add a calculated field Django doesn't know how to do a `order_by`, so it doesn't add sorting capability on that field.

If you want to add sorting on a calculated field, you have to tell Django what to pass to `order_by`. You can do this by setting the `admin_order_field` attribute on the calculated field method.

You start from the admin you wrote in the previous chapter ([How to optimize queries in Django admin?](#)):

```
hero_count.admin_order_field = 'herocount'  
villain_count.admin_order_field = 'villaincount'
```

With these changes your admin becomes:

```
@admin.register(Origin)  
class OriginAdmin(admin.ModelAdmin):  
    list_display = ("name", "hero_count", "villain_count")  
  
    def get_queryset(self, request):  
        queryset = super().get_queryset(request)  
        queryset = queryset.annotate(  
            herocount=Count("hero", distinct=True),  
            villaincount=Count("villain", distinct=True),  
        )  
        return queryset  
  
    def hero_count(self, obj):  
        return obj.herocount  
  
    def villain_count(self, obj):  
        return obj.villaincount  
  
hero_count.admin_order_field = 'herocount'  
villain_count.admin_order_field = 'villaincount'
```

Here is the admin sorted on hero_count

Select origin to change ADD ORIGIN +

Action:

Go

 0 of 3 selected

<input type="checkbox"/> NAME	HERO COUNT	VILLAIN COUNT
<input type="checkbox"/> India	2	1
<input type="checkbox"/> Norse	1	1
<input type="checkbox"/> Greece	1	0

3 origins

4. How to enable filtering on calculated fields?

You have a Hero admin which looks like this:

```
@admin.register(Hero)
class HeroAdmin(admin.ModelAdmin):
    list_display = ("name", "is_immortal", "category", "origin",
"is_very_benevolent")
    list_filter = ("is_immortal", "category", "origin",)

    def is_very_benevolent(self, obj):
        return obj.benevolence_factor > 75
```

It has one calculated field `is_very_benevolent`, and your admin looks like this

Select hero to change

Action: 0 of 4 selected

<input type="checkbox"/>	NAME	IS IMMORTAL	CATEGORY	ORIGIN	IS VERY BENEVOLENT
<input type="checkbox"/>	Thor	✖	God	Norse	True
<input type="checkbox"/>	Achilles	✖	Demi God	Greece	False
<input type="checkbox"/>	Vishnu	✔	God	India	True
<input type="checkbox"/>	Krishna	✖	Avatar	India	False

4 Heroes

FILTER

By is immortal

All
Yes
No

By category

All
God
Avatar
Demi God

By origin

All
India
Greece
Norse

You have added filtering on the fields which come from the models, but you also want to add filtering on the calculated field. To do this, you will need to subclass

SimpleListFilter like this:

```
class IsVeryBenevolentFilter(admin.SimpleListFilter):
    title = 'is_very_benevolent'
    parameter_name = 'is_very_benevolent'

    def lookups(self, request, model_admin):
        return (
            ('Yes', 'Yes'),
            ('No', 'No'),
        )

    def queryset(self, request, queryset):
        value = self.value()
        if value == 'Yes':
            return queryset.filter(benevolence_factor__gt=75)
        elif value == 'No':
            return queryset.exclude(benevolence_factor__gt=75)
        return queryset
```

And then change your list_filter to list_filter = ("is_immortal", "category", "origin", IsVeryBenevolentFilter).

With this you can filter on the calculated field, and your admin looks like this:

Select hero to change

ADD HERO +

Action: 0 of 2 selected

<input type="checkbox"/>	NAME	IS IMMORTAL	CATEGORY	ORIGIN	IS VERY BENEVOLENT
<input type="checkbox"/>	Thor	+	God	Norse	True
<input type="checkbox"/>	Vishnu	+	God	India	True

2 Heroes

FILTER

By is immortal

All

Yes

No

By category

All

God

Avatar

Demi God

By origin

All

India

Greece

Norse

By is_very_benevolent

All

Yes

No

5. How to show “on” or “off” icons for calculated boolean fields?

In the previous chapter, [How to enable filtering on calculated fields?](#) you added a boolean field.:

```
def is_very_benevolent(self, obj):  
    return obj.benevolence_factor > 75
```

Which looks like this

Select hero to change

ADD HERO +

Action: Go 0 of 2 selected

<input type="checkbox"/>	NAME	IS IMMORTAL	CATEGORY	ORIGIN	IS VERY BENEVOLENT
<input type="checkbox"/>	Thor	✖	God	Norse	True
<input type="checkbox"/>	Vishnu	✔	God	India	True

2 Heroes

FILTER

By is immortal

All

Yes

No

By category

All

God

Avatar

Demi God

By origin

All

India

Greece

Norse

By is_very_benevolent

All

Yes

No

The `is_very_benevolent` field shows the string *True* and *False*, unlike the builtin `BooleanFields` which show an on and off indicator. To fix this, you add a boolean attribute on your method. Your final `modeladmin` looks like this:

```
@admin.register(Hero)  
class HeroAdmin(admin.ModelAdmin):  
    list_display = ("name", "is_immortal", "category", "origin",  
"is_very_benevolent")
```

```
list_filter = ("is_immortal", "category", "origin",  
IsVeryBenevolentFilter)
```

```
def is_very_benevolent(self, obj):  
    return obj.benevolence_factor > 75
```

```
is_very_benevolent.boolean = True
```

And your admin looks like this

Action: 0 of 4 selected

<input type="checkbox"/>	NAME	IS IMMORTAL	CATEGORY	ORIGIN	IS VERY BENEVOLENT
<input type="checkbox"/>	Thor	✗	God	Norse	✓
<input type="checkbox"/>	Achilles	✗	Demi God	Greece	✗
<input type="checkbox"/>	Vishnu	✓	God	India	✓
<input type="checkbox"/>	Krishna	✗	Avatar	India	✗

4 Heroes

1. How to add additional actions in Django admin?

Django admin allows you to add additional actions which allow you to do bulk actions. You have been asked to add an action which will mark multiple Hero s as immortal.

You can do this by adding the action as method to ModelAdmin and adding the method as a string to actions

```
actions = ["mark_immortal"]

def mark_immortal(self, request, queryset):
    queryset.update(is_immortal=True)
```

2. How to export CSV from Django admin?

You have been asked to add ability to export Hero and Villain from the admin. There are a number of third party apps which allow doing this, but its quite easy without adding another dependency. You will add an admin action to HeroAdmin and VillanAdmin.

An admin action always has this signature `def admin_action(modeladmin, request, queryset):`, alternatively you can add it directly as a method on the `ModelAdmin` like this:

```
class SomeModelAdmin(admin.ModelAdmin):  
    def admin_action(self, request, queryset):
```

To add csv export to HeroAdmin you can do something like this:

```
actions = ["export_as_csv"]  
  
def export_as_csv(self, request, queryset):  
    pass  
  
export_as_csv.short_description = "Export Selected"
```

This adds an action called export selected, which looks like this:

Select hero to change

Action: ☒ ----- Go 0 of 4 selected

<input type="checkbox"/>	N		IS IMMORTAL
<input type="checkbox"/>	Thor		✗
<input type="checkbox"/>	Achilles		✗
<input type="checkbox"/>	Vishnu		✓
<input type="checkbox"/>	Krishna		✗

4 Heroes

You will then change the `export_as_csv` to this:

```
import csv
from django.http import HttpResponse
...

def export_as_csv(self, request, queryset):

    meta = self.model._meta
    field_names = [field.name for field in meta.fields]

    response = HttpResponse(content_type='text/csv')
    response['Content-Disposition'] = 'attachment; filename=
{}.csv'.format(meta)
    writer = csv.writer(response)

    writer.writerow(field_names)
    for obj in queryset:
        row = writer.writerow([getattr(obj, field) for field in
field_names])

    return response
```

This exports all of the selected rows. If you notice, `export_as_csv` doesn't have anything specific to `Hero`, so you can extract the method to a mixin.

With the changes, your code looks like this:

```
class ExportCsvMixin:
    def export_as_csv(self, request, queryset):

        meta = self.model._meta
        field_names = [field.name for field in meta.fields]

        response = HttpResponse(content_type='text/csv')
        response['Content-Disposition'] = 'attachment; filename=
{}.csv'.format(meta)
        writer = csv.writer(response)

        writer.writerow(field_names)
        for obj in queryset:
            row = writer.writerow([getattr(obj, field) for field in
field_names])

        return response

    export_as_csv.short_description = "Export Selected"

@admin.register(Hero)
class HeroAdmin(admin.ModelAdmin, ExportCsvMixin):
    list_display = ("name", "is_immortal", "category", "origin",
"is_very_benevolent")
    list_filter = ("is_immortal", "category", "origin",
IsVeryBenevolentFilter)
    actions = ["export_as_csv"]

...

@admin.register(Villain)
class VillainAdmin(admin.ModelAdmin, ExportCsvMixin):
    list_display = ("name", "category", "origin")
    actions = ["export_as_csv"]
```

You can add such an export to other models by subclassing from ExportCsvMixin

3. How to remove the delete selected action in Django admin?

By default Django adds a *Delete Selected* action to the listview page. You have been asked to remove the action from the Hero admin.

The method `ModelAdmin.get_actions` returns the actions shown. By overriding this method, to remove `delete_selected` We can remove it from the dropdown. Your code looks like this with the changes.:

```
def get_actions(self, request):
    actions = super().get_actions(request)
    if 'delete_selected' in actions:
        del actions['delete_selected']
    return actions
```

And your admin looks like this

Select hero to change

Actions: ✓ ----- Go 0 of 4 selected	
<input type="checkbox"/>	Thor
<input type="checkbox"/>	Achilles
<input type="checkbox"/>	Vishnu
<input type="checkbox"/>	Krishna

4 Heroes

You should also read [How to remove the 'Add'/'Delete' button for a model?](#).

4. How to add Custom Action Buttons (not actions) to Django Admin list page?

UMSRA has decided that given sufficient kryptonite, all Heroes are mortal. However, they want to be able to change their mind and say all heroes are immortal.

You have been asked to add two buttons - One which makes all heroes mortal, and one which makes all immortal. Since it affects all heroes irrespective of the selection, this needs to be a separate button, not an action dropdown.

First, we will change the template on the HeroAdmin so we can add two buttons.:

```
@admin.register(Hero)
class HeroAdmin(admin.ModelAdmin, ExportCsvMixin):
    change_list_template = "entities/heroes_changelist.html"
```

Then we will override the `get_urls`, and add the `set_immortal` and `set_mortal` methods on the model admin. They will serve as the two view methods.:

```
def get_urls(self):
    urls = super().get_urls()
    my_urls = [
        path('immortal/', self.set_immortal),
        path('mortal/', self.set_mortal),
    ]
    return my_urls + urls

def set_immortal(self, request):
    self.model.objects.all().update(is_immortal=True)
    self.message_user(request, "All heroes are now immortal")
    return HttpResponseRedirect("../")

def set_mortal(self, request):
    self.model.objects.all().update(is_immortal=False)
    self.message_user(request, "All heroes are now mortal")
    return HttpResponseRedirect("../")
```

Finally, we create the `entities/heroes_changelist.html` template by extending the `admin/change_list.html`:

```
{% extends 'admin/change_list.html' %}

{% block object-tools %}
    <div>
        <form action="immortal/" method="POST">
            {% csrf_token %}
            <button type="submit">Make Immortal</button>
        </form>
        <form action="mortal/" method="POST">
            {% csrf_token %}
            <button type="submit">Make Mortal</button>
        </form>
    </div>
    <br />
    {{ block.super }}
{% endblock %}
```

Select hero to change

Make Immortal

Make Mortal

Action: 0 of 5 selected

And after using the *make_mortal* action, the Heroes are all mortal and you see this message.

✓ All heroes are now mortal

Select hero to change

Make Immortal

Make Mortal

Action: 0 of 5 selected

<input type="checkbox"/>	NAME	IS IMMORTAL	CATEGORY	ORIGIN	IS VERY BENEVOLENT
<input type="checkbox"/>	Zeus	✗	God	Greece	✗
<input type="checkbox"/>	Thor	✗	God	Norse	✓
<input type="checkbox"/>	Achilles	✗	Demi God	Greece	✗
<input type="checkbox"/>	Vishnu	✗	God	India	✓
<input type="checkbox"/>	Krishna	✗	Avatar	India	✗

5 Heroes

5. How to import CSV using Django admin?

You have been asked to allow csv imports on the Hero admin. You will do this by adding a link to the Hero changelist page, which will take to a page with an upload form. You will write a handler for the *POST* action to create the objects from the csv.:

```
class CsvImportForm(forms.Form):
    csv_file = forms.FileField()

@admin.register(Hero)
class HeroAdmin(admin.ModelAdmin, ExportCsvMixin):
    ...
    change_list_template = "entities/heroes_changelist.html"

    def get_urls(self):
        urls = super().get_urls()
        my_urls = [
            ...
            path('import-csv/', self.import_csv),
        ]
        return my_urls + urls

    def import_csv(self, request):
        if request.method == "POST":
            csv_file = request.FILES["csv_file"]
            reader = csv.reader(csv_file)
            # Create Hero objects from passed in data
            # ...
            self.message_user(request, "Your csv file has been
imported")
            return redirect("..")
        form = CsvImportForm()
        payload = {"form": form}
        return render(
            request, "admin/csv_form.html", payload
        )
```

Then you create the `entities/heroes_changelist.html` template, by overriding the `admin/change_list.html` template like this.:

```
{% extends 'admin/change_list.html' %}

{% block object-tools %}
    <a href="import-csv/">Import CSV</a>
    <br />
    {{ block.super }}
{% endblock %}
```

Finally you create the `csv_form.html` like this.:

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

{% block content %}
    <div>
        <form action="." method="POST" enctype="multipart/form-
data">
            {{ form.as_p }}
            {% csrf_token %}

            <button type="submit">Upload CSV</button>
        </form>
    </div>
    <br />
{% endblock %}
```

With these changes, you get a link on the Hero changelist page.

Home › Entities › Heroes

✓ Your csv file has been imported

Select hero to change

Import CSV

◀ 2018 February 21 February 22

Action: ----- Go 0 of 7 selected

<input type="checkbox"/>	NAME	IS IMMORTAL	CATEGORY	ORIGIN	IS VERY BENEVOLENT	CHILDREN
<input type="checkbox"/>	Apollo	✓	God	Greece	✓	-

ADD HERO +

FILTER

By is immortal

- All
- Yes
- No

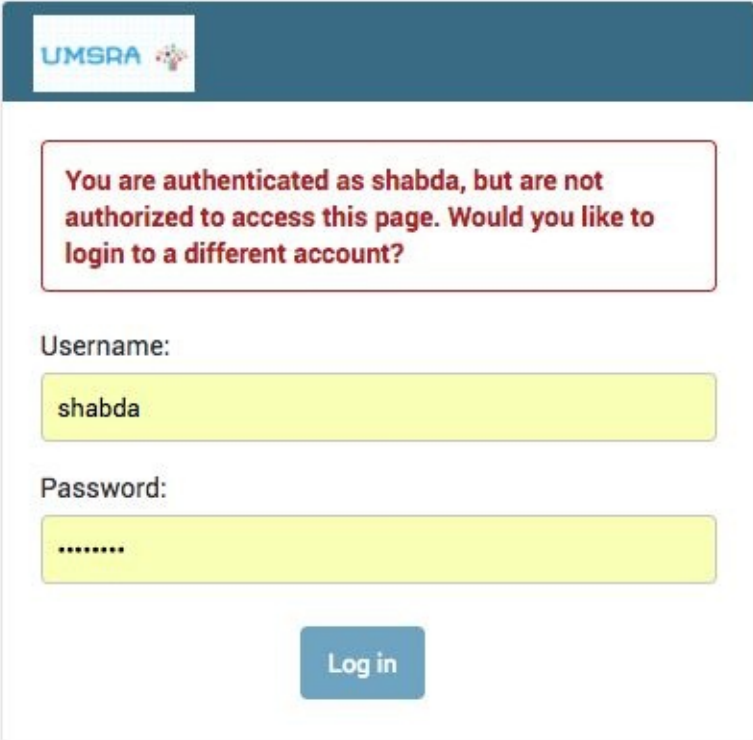
And the import form apge looks like this.

Csv file: No file chosen

1. How to restrict Django admin to specific users?

Django admin allows access to users marked as `is_staff=True`. To disable a user from being able to access the admin, you should set `is_staff=False`.

This holds true even if the user is a superuser. `is_superuser=True`. If a non-staff tries to access the admin, they see a message like this.



The screenshot shows a Django admin login interface. At the top, there is a dark blue header with the 'UMSRA' logo on the left. Below the header, a red-bordered box contains a message: 'You are authenticated as shabda, but are not authorized to access this page. Would you like to login to a different account?'. Below this message, there are two input fields: 'Username:' with the value 'shabda' and 'Password:' with masked characters '.....'. A blue 'Log in' button is positioned below the password field.

2. How to restrict access to parts of Django admin?

You can enable and restrict access to specific parts of Django admin using the permission system. When a model is added, by default, Django creates three permissions. add, change and delete

Admin uses these permissions to decide access for users. For a user with `is_superuser=False`, and no permissions, the admin looks like this

Welcome to UMSRA Researcher Portal

You don't have permission to edit anything.

If you add a permission

`user.user_permissions.add(Permission.objects.get(codename="add_hero")`
the admin starts looking like this

Entities administration

ENTITIES

Heroes

+ Add

You can add more complex logic to restrict access by changing these methods:

```
def has_add_permission(self, request):  
    ...  
  
def has_change_permission(self, request, obj=None):  
    ...  
  
def has_delete_permission(self, request, obj=None):  
    ...  
  
def has_module_permission(self, request):  
    ...
```

3. How to allow creating only one object from the admin?

The UMSRA admin has asked you to limit the number of categories to only one. They want every entity to be of the same category.

You can do this by:

```
MAX_OBJECTS = 1

def has_add_permission(self, request):
    if self.model.objects.count() >= MAX_OBJECTS:
        return False
    return super().has_add_permission(request)
```

This would hide the add button as soon as one object is created. You can set MAX_OBJECTS to any value to ensure that larger number of objects can't be created than MAX_OBJECTS.

4. How to remove the “Add”/“Delete” button for a model?

The UMSRA management has added all the Category and Origin objects and wants to disable any further addition and deletion. They have asked you to disable “Add” and “Delete” buttons. You can do this by overriding the `has_add_permission` and `has_delete_permission` in the Django admin.:

```
def has_add_permission(self, request):  
    return False  
  
def has_delete_permission(self, request, obj=None):  
    return False
```

With these changes, the admin looks like this

ENTITIES		
Categories		 Change
Heroes	 Add	 Change
Origins		 Change
Villains	 Add	 Change

Note the removed *Add* buttons. The add and delete buttons also get removed from the detail pages. You can also read [How to remove the delete selected action in Django admin?](#).

1. How to edit mutiple models from one Django admin?

To be able to edit multiple objects from one Django admin, you need to use inlines.

You have the Category model, and you need to add and edit villain models inside the admin for Category. You can do:

```
class VillainInline(admin.StackedInline):
    model = Villain

@admin.register(Category)
class CategoryAdmin(admin.ModelAdmin):
    ...

    inlines = [VillainInline]
```

You can see the form to add and edit villain inside the Category admin. If the Inline model has alot of fields, use StackedInline else use TabularInline.

The screenshot shows the Django admin interface for a 'Category' model. The breadcrumb trail is 'Home > Entities > Categories > God'. The main heading is 'Change category' with a 'HISTORY' button. Below this is a form for the 'God' category with a 'Name' field containing 'God'. A section titled 'VILLAINS' contains an inline form for a 'Villain' object named 'Ravana'. This form has fields for 'Name' (Ravana), 'Alternative name' (empty), 'Origin' (India with a dropdown arrow), 'Gender' (Male with a dropdown arrow), and 'Description' (Primary antagonist in Ramayana). A 'Delete' button is visible next to the 'Villain: Ravana' header.

2. How to add One to One relation as admin inline?

OneToOneFields can be set as inlines in the same way as a FK. However, only one side of the OneToOneField can be set as the inline model.

You have a HeroAcquaintance model which has a One to one relation to hero like this.:

```
class HeroAcquaintance(models.Model):
    "Non family contacts of a Hero"
    hero = models.OneToOneField(Hero, on_delete=models.CASCADE)
    ....
```

You can add this as inline to Hero like this:

```
class HeroAcquaintanceInline(admin.TabularInline):
    model = HeroAcquaintance

@admin.register(Hero)
class HeroAdmin(admin.ModelAdmin, ExportCsvMixin):
    ...
    inlines = [HeroAcquaintanceInline]
```

Headshot:

Choose File

No file chosen

Father:

Zeus



Mother:



Spouse:



Headshot image:

HERO ACQUAINTANCES			
FRIENDS	DETRACTORS	MAIN ANATAGONISTS	DELETE?
<div><div>Krishna Vishnu Achilles Thor</div><div>+</div></div>	<div><div>Krishna Vishnu Achilles Thor</div><div>+</div></div>	<div><div>Ravana Fenrir</div><div>+</div></div>	

Delete

Save and add another

Save and continue editing

SAVE

3. How to add nested inlines in Django admin?

You have your models defined like this:

```
class Category(models.Model):  
    ...  
  
class Hero(models.Model):  
    category = models.ForeignKey(Category)  
    ...  
  
class HeroAcquaintance(models.Model):  
    hero = models.OneToOneField(Hero, on_delete=models.CASCADE)  
    ...
```

You want to have one admin page to create Category, Hero and HeroAcquaintance objects. However, Django doesn't support nested inline with Foreign Keys or One To One relations which span more than one levels. You have a few options,

You can change the HeroAcquaintance model, so that it has a direct FK to Category, something like this:

```
class HeroAcquaintance(models.Model):  
    hero = models.OneToOneField(Hero, on_delete=models.CASCADE)  
    category = models.ForeignKey(Category)  
  
    def save(self, *args, **kwargs):  
        self.category = self.hero.category  
        super().save(*args, **kwargs)
```

Then you can attach HeroAcquaintanceInline to CategoryAdmin, and get a kind of nested inline.

Alternatively, there are a few third party Django apps which allow nested inline. A quick Github or DjangoPackages search will find one which suits your needs and tastes.

4. How to create a single Django admin from two different models?

Hero has a FK to Category, so you can select a category from Hero admin. If you want to also be able to create Category objects from Hero admin, you can change the form for Hero admin, and customise the `save_model` behaviour.:

```
class HeroForm(forms.ModelForm):
    category_name = forms.CharField()

    class Meta:
        model = Hero
        exclude = ["category"]

@admin.register(Hero)
class HeroAdmin(admin.ModelAdmin, ExportCsvMixin):
    form = HeroForm
    ....

    def save_model(self, request, obj, form, change):
        category_name = form.cleaned_data["category_name"]
        category, _ =
        Category.objects.get_or_create(name=category_name)
        obj.category = category
        super().save_model(request, obj, form, change)
```

With this change, your admin looks like below and has allows creating or updating category from the Hero admin.

Father:

Zeus



Mother:



Spouse:



Category name:

Headshot image:

-

1. How to show larger number of rows on listview page?

You have been asked to increase the number of heroes one can see on a single page to 250. (The default is 100). You can do this by:

```
@admin.register(Hero)
class HeroAdmin(admin.ModelAdmin, ExportCsvMixin):
    ...
    list_per_page = 250
```

You can also set it to a smaller value. If we set it to 1 as `list_per_page = 1` the admin looks like this.

Select hero to change

Action: 0 of 1 selected

<input type="checkbox"/>	NAME	IS IMMORTAL	CATEGORY	ORIGIN	IS VERY BENEVOLENT
<input type="checkbox"/>	Thor	✓	God	Norse	✓

1 2 3 4 4 Heroes [Show all](#)

2. How to disable django admin pagination?

If you want to completely disable pagination on a admin listview page, you can do this.

```
import sys
...

@admin.register(Hero)
class HeroAdmin(admin.ModelAdmin, ExportCsvMixin):
    ...

    list_per_page = sys.maxsize
```

You can also read [How to show larger number of rows on listview page?](#).

3. How to add date based filtering in Django admin?

You can add a date based filtering on any date field by setting the `date_hierarchy`:

```
@admin.register(Hero)
class HeroAdmin(admin.ModelAdmin, ExportCsvMixin):
    ...
    date_hierarchy = 'added_on'
```

It looks like this:

◀ 2018 February 19 February 20

Action: 0 of 7 selected

<input type="checkbox"/>	NAME	IS IMMORTAL	CATEGORY
<input type="checkbox"/>	Apollo	✓	God
<input type="checkbox"/>	Athena	✓	God
<input type="checkbox"/>	Zeus	✗	God
<input type="checkbox"/>	Thor	✗	God
<input type="checkbox"/>	Achilles	✗	Demi God
<input type="checkbox"/>	Vishnu	✗	God
<input type="checkbox"/>	Krishna	✗	Avatar

7 Heroes

This can be very costly with a large number of objects. As an alternative, you can subclass `SimpleListFilter`, and allow filtering only on years or the months.

4. How to show many to many or reverse FK fields on listview page?

For heroes you can track their father using this field:

```
father = models.ForeignKey(
    "self", related_name="children", null=True, blank=True,
    on_delete=models.SET_NULL
)
```

You have been asked to show the children of each Hero, on the listview page. Hero objects have the children reverse FK attribute, but you can't add that to the `:list_display`. You need to add an attribute to `ModelAdmin` and use that in `list_display`. You can do it like this:

```
@admin.register(Hero)
class HeroAdmin(admin.ModelAdmin, ExportCsvMixin):
    ...

    def children_display(self, obj):
        return ", ".join(
            child.name for child in obj.children.all()
        )
    children_display.short_description = "Children"
```

You will see a column for children like this:

Select hero to change

Make Immortal

Make Mortal

Action: 0 of 7 selected

<input type="checkbox"/>	NAME	IS IMMORTAL	CATEGORY	ORIGIN	IS VERY BENEVOLENT	CHILDREN
<input type="checkbox"/>	Apollo	✓	God	Greece	✓	-
<input type="checkbox"/>	Athena	✓	God	Greece	✗	-
<input type="checkbox"/>	Zeus	✗	God	Greece	✗	Athena, Apollo
<input type="checkbox"/>	Thor	✗	God	Norse	✓	-
<input type="checkbox"/>	Achilles	✗	Demi God	Greece	✗	-
<input type="checkbox"/>	Vishnu	✗	God	India	✓	-
<input type="checkbox"/>	Krishna	✗	Avatar	India	✗	-

7 Heroes

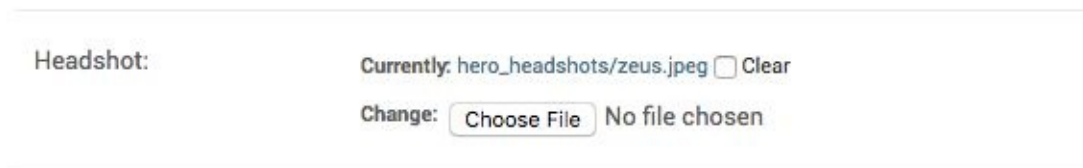
You can use the same method for M2M relations as well. You should also read [How to get Django admin urls for specific objects?](#).

1. How to show image from Imagefield in Django admin.

In your Hero model, you have an image field.:

```
headshot = models.ImageField(null=True, blank=True,
upload_to="hero_headshots/")
```

By default it shows up like this:



You have been asked to change it to that the actual image also shows up on the change page. You can do it likethis:

```
@admin.register(Hero)
class HeroAdmin(admin.ModelAdmin, ExportCsvMixin):

    readonly_fields = [..., "headshot_image"]

    def headshot_image(self, obj):
        return mark_safe(''.format(
            url = obj.headshot.url,
            width=obj.headshot.width,
            height=obj.headshot.height,
        )
    )
```

With this change, your imagefield looks like this:

Headshot:

Currently: hero_headshots/zeus.jpeg ☐ Clear

Change: No file chosen

Father:

-

Mother:

-

Spouse:

-

Headshot image:



Delete

2. How to associate model with current user while saving?

The Hero model has the following field.:

```
added_by = models.ForeignKey(settings.AUTH_USER_MODEL,
                             null=True, blank=True, on_delete=models.SET_NULL)
```

You want the added_by field to be automatically set to current user whenever object is created from admin. You can do this.:

```
def save_model(self, request, obj, form, change):
    if not obj.pk:
        # Only set added_by during the first save.
        obj.added_by = request.user
    super().save_model(request, obj, form, change)
```

If instead you wanted to always save the current user, you can do.:

```
def save_model(self, request, obj, form, change):
    obj.added_by = request.user
    super().save_model(request, obj, form, change)
```

If you also want to hide the added_by field to not show up on the change form, you can do.:

```
@admin.register(Hero)
class HeroAdmin(admin.ModelAdmin, ExportCsvMixin):
    ...
    exclude = ['added_by',]
```

3. How to mark a field as readonly in admin?

UMSRA has temporarily decided to stop tracking the family trees of mythological entities. You have been asked to make the father, mother and spouse fields readonly.

You can do this by:

```
@admin.register(Hero)
class HeroAdmin(admin.ModelAdmin, ExportCsvMixin):
    ...
    readonly_fields = ["father", "mother", "spouse"]
```

Your create form looks like this:

<input checked="" type="checkbox"/> Is immortal	
Benevolence factor:	<input type="text"/> How benevolent this hero is?
Arbitrariness factor:	<input type="text"/> How arbitrary this hero is?
Father:	-
Mother:	-
Spouse:	-

4. How to show an uneditable field in admin?

If you have a field with `editable=False` in your model, that field, by default, is hidden in the change page. This also happens with any field marked as `auto_now` or `auto_now_add`, because that sets the `editable=False` on these fields.

If you want these fields to show up on the change page, you can add them to `readonly_fields`:

```
@admin.register(Villain)
class VillainAdmin(admin.ModelAdmin, ExportCsvMixin):
    ...
    readonly_fields = ["added_on"]
```

With this change the Villain admin looks like this:

☒ Is unique

Count:

1

Added on:

Feb. 19, 2018

Delete

5. How to make a field editable while creating, but read only in existing objects?

You need to make the name and category read only once a Hero is created. However during the first write the fields need to be editable.

You can do this by overriding `get_readonly_fields` method, like this:

```
def get_readonly_fields(self, request, obj=None):  
    if obj:  
        return ["name", "category"]  
    else:  
        return []
```

`obj` is `None` during the object creation, but set to the object being edited during an edit.

6. How to filter FK dropdown values in django admin?

Your Hero model has a FK to Category. So all category objects will show in the admin dropdown for category. If instead, you wanted to see only a subset, Django allows you to customize that by overriding `formfield_for_foreignkey`:

```
@admin.register(Hero)
class HeroAdmin(admin.ModelAdmin, ExportCsvMixin):
    ...
    def formfield_for_foreignkey(self, db_field, request,
**kwargs):
        if db_field.name == "category":
            kwargs["queryset"] = Category.objects.filter(name__in=
['God', 'Demi God'])
        return super().formfield_for_foreignkey(db_field, request,
**kwargs)
```

Change hero

Name:	<input type="text" value="Apollo"/>
Alternative name:	<input type="text"/>
Category:	<div><div>-----</div><div>✓ God</div><div>Demi God</div></div>
Origin:	<div>Greece</div>

7. How to manage a model with a FK with a large number of objects?

You can create a large number of categories like this:

```
categories = [Category(**{"name": "cat-{}".format(i)}) for i in range(100000)]
Category.objects.bulk_create(categories)
```

Now as Category has more than 100000 objects, when you go to the Hero admin, it will have category dropdown with 100000 selections. This will make the page both slow and the dropdown hard to use.

You can change how admin handles it by setting the `raw_id_fields`:

```
@admin.register(Hero)
class HeroAdmin(admin.ModelAdmin, ExportCsvMixin):
    ...
    raw_id_fields = ["category"]
```

This change the Hero admin to look like:

Change hero

Name:	<input type="text" value="Apollo"/>
Alternative name:	<input type="text"/>
Category:	<input type="text" value="1"/> Q God

Add the popup looks like this

cat-99905

cat-99904

cat-99903

cat-99902

cat-99901

cat-99900

1 2 3 4 ... 1000 1001 100004 Categories

8. How to change ForeignKey display text in dropdowns?

Hero has a FK to Category. In the dropdown, rather than just the name, you want to show the text "Category: <name>".

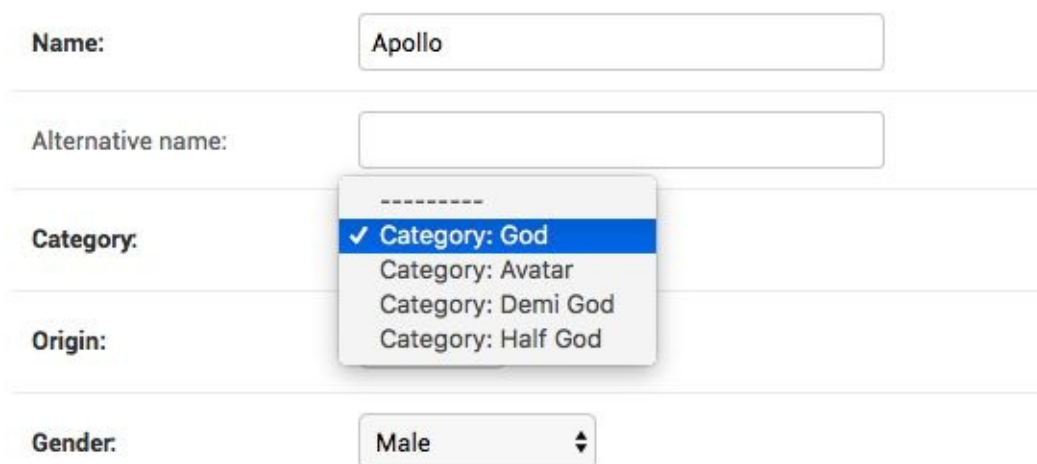
You can change the `__str__` method on Category, but you only want this change in the admin. You can do this by creating a subclassing `forms.ModelChoiceField` with a custom `label_from_instance`:

```
class CategoryChoiceField(forms.ModelChoiceField):
    def label_from_instance(self, obj):
        return "Category: {}".format(obj.name)
```

You can then override `formfield_for_foreignkey` to use this field type for category.:

```
def formfield_for_foreignkey(self, db_field, request, **kwargs):
    if db_field.name == 'category':
        return CategoryChoiceField(queryset=Category.objects.all())
    return super().formfield_for_foreignkey(db_field, request,
**kwargs)
```

Your admin look like this.



The screenshot shows a Django admin form for a 'Hero' model. The form contains the following fields:

- Name:** A text input field containing the value 'Apollo'.
- Alternative name:** An empty text input field.
- Category:** A dropdown menu. The dropdown is open, showing a list of categories: 'Category: God' (which is selected and highlighted in blue), 'Category: Avatar', 'Category: Demi God', and 'Category: Half God'.
- Origin:** An empty text input field.
- Gender:** A dropdown menu with 'Male' selected.

9. How to add a custom button to Django change view page?

Villain has a field called `is_unique`:

```
class Villain(Entity):  
    ...  
    is_unique = models.BooleanField(default=True)
```

You want to add a button on Villain change form page called "Make Unique", which make this Villain unique. Any other villain with the same name should be deleted.

You start by extending the `change_form` to add a new button.:

```
{% extends 'admin/change_form.html' %}  
  
{% block submit_buttons_bottom %}  
    {{ block.super }}  
    <div class="submit-row">  
        <input type="submit" value="Make Unique" name="_make-unique">  
    </div>  
{% endblock %}
```

Then you can override `response_change` and connect your template to the `VillainAdmin`.:

```
@admin.register(Villain)  
class VillainAdmin(admin.ModelAdmin, ExportCsvMixin):  
    ...  
    change_form_template = "entities/villain_changeform.html"  
  
    def response_change(self, request, obj):  
        if "_make-unique" in request.POST:  
            matching_names_except_this =  
self.get_queryset(request).filter(name=obj.name).exclude(pk=obj.id)  
            matching_names_except_this.delete()  
            obj.is_unique = True
```

```
obj.save()
self.message_user(request, "This villain is now
unique")
return HttpResponseRedirect(".")
return super().response_change(request, obj)
```

This is how your admin looks now.

Malevolence factor:	<input type="text" value="70"/>
	How malevolent this villain is?
Power factor:	<input type="text" value="40"/>
	How powerful this villain is?
<input checked="" type="checkbox"/> Is unique	
Count:	<input type="text" value="1"/>
Added on:	Feb. 23, 2018

Delete

Save and add another

Save and continue editing

SAVE

Make Unique

1. How to get Django admin urls for specific objects?

You have a children column displaying the names of each heroesâ€™ children. You have been asked to link each children to the change page. You can do it like this.:

```
@admin.register(Hero)
class HeroAdmin(admin.ModelAdmin, ExportCsvMixin):
    ...

    def children_display(self, obj):
        display_text = ", ".join([
            "<a href={}>{}</a>".format(
                reverse('admin:{}_{}_change'.format(obj._meta.app_label, obj._meta.model_name),
                    args=(child.pk,)),
                child.name)
            for child in obj.children.all()
        ])
        if display_text:
            return mark_safe(display_text)
        return "-"
```

The `reverse('admin:{}_{}_change'.format(obj._meta.app_label, obj._meta.model_name), args=(child.pk,))`, gives the change url for an object.

The other options are

- Delete: `reverse('admin:{}_{}_delete'.format(obj._meta.app_label, obj._meta.model_name), args=(child.pk,))`
- History: `reverse('admin:{}_{}_history'.format(obj._meta.app_label, obj._meta.model_name), args=(child.pk,))`

2. How to add a model twice to Django admin?

You need to add the Hero model twice to the admin, one as a regular admin area, and one as read only admin. (Some user will potentially see only the read only admin.)

If you have try to register the same model twice:

```
admin.site.register(Hero)
admin.site.register(Hero)
```

you will get an error like this:

```
raise AlreadyRegistered('The model %s is already registered' %
model.__name__)
```

The solution is to subclass the Hero model as a ProxyModel.:

```
# In models.py
class HeroProxy(Hero):

    class Meta:
        proxy = True

...
# In admin.py
@admin.register(Hero)
class HeroAdmin(admin.ModelAdmin, ExportCsvMixin):
    list_display = ("name", "is_immortal", "category", "origin",
"is_very_benevolent")
    ....

@admin.register(HeroProxy)
class HeroProxyAdmin(admin.ModelAdmin):
    readonly_fields = ("name", "is_immortal", "category", "origin",
    ...)
```

3. How to override save behaviour for Django admin?

ModelAdmin has a `save_model` method, which is used for creating and updating model objects. By overriding this, you can customize the save behaviour for admin.

The Hero model has the following field.:

```
added_by = models.ForeignKey(settings.AUTH_USER_MODEL,  
                             null=True, blank=True, on_delete=models.SET_NULL)
```

If you want to always save the current user whenever the Hero is updated, you can do.:

```
def save_model(self, request, obj, form, change):  
    obj.added_by = request.user  
    super().save_model(request, obj, form, change)
```

4. How to add a database view to Django admin?

You have a database view, created as this:

```
create view entities_entity as
  select id, name from entities_hero
  union
  select 10000+id as id, name from entities_villain
```

It has all the names from Hero and Villain. The idTMs for Villain are set to 10000+id as id because we donTMt intend to cross 10000 Heroes:

```
sqlite> select * from entities_entity;
1|Krishna
2|Vishnu
3|Achilles
4|Thor
5|Zeus
6|Athena
7|Apollo
10001|Ravana
10002|Fenrir
```

Then you add a managed=False model:

```
class AllEntity(models.Model):
    name = models.CharField(max_length=100)

    class Meta:
        managed = False
        db_table = "entities_entity"
```

And add it to admin.:

```
@admin.register(AllEntity)
class AllEntiryAdmin(admin.ModelAdmin):
    list_display = ("id", "name")
```

And your admin looks like this

Action: 0 of 9 selected

<input type="checkbox"/>	ID	NAME
<input type="checkbox"/>	10002	Fenrir
<input type="checkbox"/>	10001	Ravana
<input type="checkbox"/>	7	Apollo
<input type="checkbox"/>	6	Athena
<input type="checkbox"/>	5	Zeus
<input type="checkbox"/>	4	Thor
<input type="checkbox"/>	3	Achilles
<input type="checkbox"/>	2	Vishnu
<input type="checkbox"/>	1	Krishna
9 all entitys		

5. How to set ordering of Apps and models in Django admin dashboard.

Django, by default, orders the models in admin alphabetically. So the order of models in Event admin is Epic, EventHero, EventVillain, Event

Instead you want the order to be

- EventHero, EventVillain, Epic then event.

The template used to render the admin index page is `admin/index.html` and the view function is `ModelAdmin.index`.

```
def index(self, request, extra_context=None):
    """
    Display the main admin index page, which lists all of the
    installed
    apps that have been registered in this site.
    """
    app_list = self.get_app_list(request)
    context = {
        **self.each_context(request),
        'title': self.index_title,
        'app_list': app_list,
        **(extra_context or {}),
    }

    request.current_app = self.name

    return TemplateResponse(request, self.index_template or
                            'admin/index.html', context)
```

The method `get_app_list`, set the order of the models.:

```
def get_app_list(self, request):
    """
    Return a sorted list of all the installed apps that have been
    registered in this site.
    """
    app_dict = self._build_app_dict(request)
```

```

    # Sort the apps alphabetically.
    app_list = sorted(app_dict.values(), key=lambda x:
x['name'].lower())

    # Sort the models alphabetically within each app.
    for app in app_list:
        app['models'].sort(key=lambda x: x['name'])

    return app_list

```

So to set the order we override get_app_list as:

```

class EventAdminSite(AdminSite):
    def get_app_list(self, request):
        """
        Return a sorted list of all the installed apps that have
        been
        registered in this site.
        """
        ordering = {
            "Event heros": 1,
            "Event villains": 2,
            "Epics": 3,
            "Events": 4
        }
        app_dict = self._build_app_dict(request)
        # a.sort(key=lambda x: b.index(x[0]))
        # Sort the apps alphabetically.
        app_list = sorted(app_dict.values(), key=lambda x:
x['name'].lower())

        # Sort the models alphabetically within each app.
        for app in app_list:
            app['models'].sort(key=lambda x: ordering[x['name']])

        return app_list

```

The code `app['models'].sort(key=lambda x: ordering[x['name']])` sets the fixed ordering. Your app now looks like this.

Welcome to UMSRA Researcher Events Portal

EVENTS		
Event heros	+ Add	✎ Change
Event villains	+ Add	✎ Change
Epics	+ Add	✎ Change
Events	+ Add	✎ Change

Models used in this book

App entities

The models are:

```
class Category(models.Model):
    name = models.CharField(max_length=100)

    class Meta:
        verbose_name_plural = "Categories"

    def __str__(self):
        return self.name

class Origin(models.Model):
    name = models.CharField(max_length=100)

    def __str__(self):
        return self.name

class Entity(models.Model):
    GENDER_MALE = "Male"
    GENDER_FEMALE = "Female"
    GENDER_OTHERS = "Others/Unknown"

    name = models.CharField(max_length=100)
    alternative_name = models.CharField(
        max_length=100, null=True, blank=True
    )
```

```
        category = models.ForeignKey(Category,
on_delete=models.CASCADE)
        origin = models.ForeignKey(Origin, on_delete=models.CASCADE)
        gender = models.CharField(
            max_length=100,
            choices=(
                (GENDER_MALE, GENDER_MALE),
                (GENDER_FEMALE, GENDER_FEMALE),
                (GENDER_OTHERS, GENDER_OTHERS),
            )
        )
        description = models.TextField()
```

```
def __str__(self):
    return self.name
```

```
class Meta:
    abstract = True
```

```
class Hero(Entity):
```

```
    class Meta:
        verbose_name_plural = "Heroes"
```

```
    is_immortal = models.BooleanField(default=True)
```

```
    benevolence_factor = models.PositiveSmallIntegerField(
        help_text="How benevolent this hero is?"
```

```

    )
    arbitrariness_factor = models.PositiveSmallIntegerField(
        help_text="How arbitrary this hero is?"
    )
    # relationships
    father = models.ForeignKey(
        "self", related_name="+", null=True, blank=True,
on_delete=models.SET_NULL
    )
    mother = models.ForeignKey(
        "self", related_name="+", null=True, blank=True,
on_delete=models.SET_NULL
    )
    spouse = models.ForeignKey(
        "self", related_name="+", null=True, blank=True,
on_delete=models.SET_NULL
    )

```

```

class Villain(Entity):
    is_immortal = models.BooleanField(default=False)

    malevolence_factor = models.PositiveSmallIntegerField(
        help_text="How malevolent this villain is?"
    )
    power_factor = models.PositiveSmallIntegerField(
        help_text="How powerful this villain is?"
    )
    is_unique = models.BooleanField(default=True)
    count = models.PositiveSmallIntegerField(default=1)

```

App events

The models are:

```
class Epic(models.Model):
    name = models.CharField(max_length=255)
    participating_heroes = models.ManyToManyField(Hero)
    participating_villains = models.ManyToManyField(Villain)

class Event(models.Model):
    epic = models.ForeignKey(Epic, on_delete=models.CASCADE)
    details = models.TextField()
    years_ago = models.PositiveIntegerField()

class EventHero(models.Model):
    event = models.ForeignKey(Event, on_delete=models.CASCADE)
    hero = models.ForeignKey(Hero, on_delete=models.CASCADE)
    is_primary = models.BooleanField()

class EventVillain(models.Model):
    event = models.ForeignKey(Event, on_delete=models.CASCADE)
    hero = models.ForeignKey(Villain, on_delete=models.CASCADE)
    is_primary = models.BooleanField()
```

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