django



## Documentation

Search 3.0 documentation

Q

# Widgets

A widget is Django's representation of an HTML input element. The widget handles the rendering of the HTML, and the extraction of data from a GET/POST dictionary that corresponds to the widget.

The HTML generated by the built-in widgets uses HTML5 syntax, targeting<!DOCTYPE html>. For example, it uses boolean attributes such as checked rather than the XHTML style of checked '.



## Tip

Widgets should not be confused with the form fields. Form fields deal with the logic of input validation and are used directly in templates. Widgets deal with rendering of HTML form input elements on the web page and extraction of raw submitted data. However, widgets do need to be assigned to form fields.

# Specifying widgets

Whenever you specify a field on a form, Django will use a default widget that is appropriate to the type of data that is to be displayed. To find which widget is used on which field, see the documentation about Built-in Field classes.

However, if you want to use a different widget for a field, you can use thewidget argument on the field definition. For example:

```
from django import forms

class CommentForm(forms.Form):
    name = forms.CharField()
    url = forms.URLField()
    comment = forms.CharField(widget=forms.Textarea)
```

This would specify a form with a comment that uses a larger **Textarea** widget, rather than the default **TextInput** widget.

# Setting arguments for widgets

Many widgets have optional extra arguments; they can be set when defining the widget on the field. In the following example, they can be set for a **SelectDateWidget**:

See the Built-in widgets for more information about which widgets are available and which arguments they accept.

# Widgets inheriting from the Select widget

Widgets inheriting from the **Select** widget deal with choices. They present the user with a list of options to choose from. The different widgets present this choice differently; the **Select** widget itself uses a **<select>** HTML list representation, while **RadioSelect** uses radio buttons.

**Select** widgets are used by default on **ChoiceField** fields. The choices displayed on the widget are inherited from the **ChoiceField** and changing **ChoiceField.choices** will update **Select.choices**. For example:

```
>>> from django import forms
>>> CHOICES = [('1', 'First'), ('2', 'Second')]
>>> choice_field = forms.ChoiceField(widget=forms.RadioSelect, choices=CHOICES)
>>> choice_field.choices
[('1', 'First'), ('2', 'Second')]
>>> choice_field.widget.choices
[('1', 'First'), ('2', 'Second')]
>>> choice_field.widget.choices = []
>>> choice_field.widget.choices = [('1', 'First and only')]
>>> choice_field.widget.choices
[('1', 'First and only')]
```

Widgets which offer a **choices** attribute can however be used with fields which are not based on choice – such as **CharField** – but it is recommended to use a **ChoiceField**-based field when the choices are inherent to the model and not just the representational widget.

# Customizing widget instances

When Django renders a widget as HTML, it only renders very minimal markup - Django doesn't add class names, or any other widget-specific attributes. This means, for example, that all **TextInput** widgets will appear the same on your Web pages.

There are two ways to customize widgets: per widget instance and per widget class.

## Styling widget instances

If you want to make one widget instance look different from another, you will need to specify additional attributes at the time when the widget object is instantiated and assigned to a form field (and perhaps add some rules to your CSS files).

For example, take the following form:

```
from django import forms

class CommentForm(forms.Form):
   name = forms.CharField()
   url = forms.URLField()
   comment = forms.CharField()
```

This form will include three default **TextInput** widgets, with default rendering – no CSS class, no extra attributes. This means that the input boxes provided for each widget will be rendered exactly the same:

On a real Web page, you probably don't want every widget to look the same. You might want a larger input element for the comment, and you might want the 'name' widget to have some special CSS class. It is also possible to specify the 'type' attribute to take advantage of the new HTML5 input types. To do this, you use the **Widget.attrs** argument when creating the widget:

```
class CommentForm(forms.Form):
    name = forms.CharField(widget=forms.TextInput(attrs={'class': 'special'}))
    url = forms.URLField()
    comment = forms.CharField(widget=forms.TextInput(attrs={'size': '40'}))
```

You can also modify a widget in the form definition:

```
class CommentForm(forms.Form):
    name = forms.CharField()
    url = forms.URLField()
    comment = forms.CharField()

    name.widget.attrs.update({'class': 'special'})
    comment.widget.attrs.update(size='40')
```

Or if the field isn't declared directly on the form (such as model form fields), you can use the **Form.fields** attribute:

```
class CommentForm(forms.ModelForm):
    def __init__(self, *args, **kwargs):
        super().__init__(*args, **kwargs)
        self.fields['name'].widget.attrs.update({'class': 'special'})
        self.fields['comment'].widget.attrs.update(size='40')
```

Django will then include the extra attributes in the rendered output:

You can also set the HTMLid using attrs. See BoundField.id\_for\_label for an example.

## Styling widget classes

With widgets, it is possible to add assets (css and javascript) and more deeply customize their appearance and behavior.

In a nutshell, you will need to subclass the widget and eitherdefine a "Media" inner class or create a "media" property.

These methods involve somewhat advanced Python programming and are described in detail in the form Assets topic guide.

# Base widget classes

Base widget classes Widget and MultiWidget are subclassed by all thebuilt-in widgets and may serve as a foundation for custom widgets.

# Widget

### class Widget(attrs=None)

This abstract class cannot be rendered, but provides the basic attribut eattrs. You may also implement or override the render() method on custom widgets.

#### attrs

A dictionary containing HTML attributes to be set on the rendered widget.

```
>>> from django import forms
>>> name = forms.TextInput(attrs={'size': 10, 'title': 'Your name'})
>>> name.render('name', 'A name')
'<input title="Your name" type="text" name="name" value="A name" size="10">'
```

If you assign a value of True or False to an attribute, it will be rendered as an HTML5 boolean attribute:

```
>>> name = forms.TextInput(attrs={'required': True})
>>> name.render('name', 'A name')
'<input name="name" type="text" value="A name" required>'
>>>
>>> name = forms.TextInput(attrs={'required': False})
>>> name.render('name', 'A name')
'<input name="name" type="text" value="A name">'
```

## ${\it supports\_microseconds}$

An attribute that defaults to True. If set to False, the microseconds part of datetime and time values will be set to 0.

## format\_value(value)

Cleans and returns a value for use in the widget template.**value** isn't guaranteed to be valid input, therefore subclass implementations should program defensively.

## get\_context(name, value, attrs)

Returns a dictionary of values to use when rendering the widget template. By default, the dictionary contains a single key, widget', which is a dictionary representation of the widget containing the following keys:

- 'name': The name of the field from thename argument.
- 'is\_hidden': A boolean indicating whether or not this widget is hidden.
- 'required': A boolean indicating whether or not the field for this widget is required.
- 'value': The value as returned byformat\_value().
- 'attrs': HTML attributes to be set on the rendered widget. The combination of thættrs attribute and the attrs argument.
- 'template\_name': The value of self.template\_name.

Widget subclasses can provide custom context values by overriding this method.

## id\_for\_label(id\_)

Returns the HTML ID attribute of this widget for use by a<a href="laget-1">laget-1</a>, given the ID of the field. Returns None if an ID isn't available.

This hook is necessary because some widgets have multiple HTML elements and, thus, multiple IDs. In that case, this method should return an ID value that corresponds to the first ID in the widget's tags.

#### render(name, value, attrs=None, renderer=None)

Renders a widget to HTML using the given renderer. If renderer is None, the renderer from the FORM\_RENDERER setting is used.

## value\_from\_datadict(data, files, name)

Given a dictionary of data and this widget's name, returns the value of this widget. **files** may contain data coming from **request.FILES**. Returns **None** if a value wasn't provided. Note also that **value\_from\_datadict** may be called more than once during handling of form data, so if you customize it and add expensive processing, you should implement some caching mechanism yourself.

### value\_omitted\_from\_data(data, files, name)

Given data and files dictionaries and this widget's name, returns whether or not there's data or files for the widget.

The method's result affects whether or not a field in a model formfalls back to its default

Special cases are CheckboxInput, CheckboxSelectMultiple, and SelectMultiple, which always return False because an unchecked checkbox and unselected <select multiple> don't appear in the data of an HTML form submission, so it's unknown whether or not the user submitted a value.

#### use\_required\_attribute(initial)

Given a form field's **initial** value, returns whether or not the widget can be rendered with the**required** HTML attribute. Forms use this method along with **Field.required** and **Form.use\_required\_attribute** to determine whether or not to display the**required** attribute for each field.

By default, returns **False** for hidden widgets and **True** otherwise. Special cases are **ClearableFileInput**, which returns **False** when **initial** is set, and **CheckboxSelectMultiple**, which always returns **False** because browser validation would require all checkboxes to be checked instead of at least one.

Override this method in custom widgets that aren't compatible with browser validation. For example, a WSYSIWG text editor widget backed by a hidden **textarea** element may want to always return**False** to avoid browser validation on the hidden field.

# MultiWidget

## class MultiWidget(widgets, attrs=None)

A widget that is composed of multiple widgets. MultiWidget works hand in hand with the MultiValueField.

MultiWidget has one required argument:

## widgets

An iterable containing the widgets needed.

And one required method:

## decompress(value)

This method takes a single "compressed" value from the field and returns a list of "decompressed" values. The input value can be assumed valid, but not necessarily non-empty.

This method must be implemented by the subclass, and since the value may be empty, the implementation must be defensive.

The rationale behind "decompression" is that it is necessary to "split" the combined value of the form field into the values for each widget.

An example of this is how **SplitDateTimeWidget** turns a **datetime** value into a list with date and time split into two separate values:

```
from django.forms import MultiWidget

class SplitDateTimeWidget(MultiWidget):

# ...

def decompress(self, value):
    if value:
        return [value.date(), value.time()]
    return [None, None]
```



#### Tip

Note that **MultiValueField** has a complementary method **compress()** with the opposite responsibility - to combine cleaned values of all member fields into one.

It provides some custom context:

### get\_context(name, value, attrs)

In addition to the 'widget' key described in Widget.get\_context(), MultiValueWidget adds a widget['subwidgets'] key.

These can be looped over in the widget template:

```
{% for subwidget in widget.subwidgets %}
    {% include subwidget.template_name with widget=subwidget %}
{% endfor %}
```

Here's an example widget which subclasses **MultiWidget** to display a date with the day, month, and year in different select boxes. This widget is intended to be used with a **DateField** rather than a **MultiValueField**, thus we have implemented **value\_from\_datadict()**:

```
from datetime import date
from django import forms
class DateSelectorWidget(forms.MultiWidget):
   def __init__(self, attrs=None):
       days = [(day, day) for day in range(1, 32)]
       months = [(month, month) for month in range(1, 13)]
       years = [(year, year) for year in [2018, 2019, 2020]]
       widgets = [
            forms.Select(attrs=attrs, choices=days),
            forms.Select(attrs=attrs, choices=months),
            forms.Select(attrs=attrs, choices=years),
       ]
       super().__init__(widgets, attrs)
    def decompress(self, value):
       if isinstance(value, date):
            return [value.day, value.month, value.year]
       elif isinstance(value, str):
            year, month, day = value.split('-')
            return [day, month, year]
       return [None, None, None]
    def value_from_datadict(self, data, files, name):
       day, month, year = super().value_from_datadict(data, files, name)
        # DateField expects a single string that it can parse into a date.
       return '{}-{}-{}'.format(year, month, day)
```

The constructor creates several **Select** widgets in a list. The **super()** method uses this list to setup the widget.

The required method **decompress()** breaks up a **datetime.date** value into the day, month, and year values corresponding to each widget. If an invalid date was selected, such as the non-existent 30th February, the **DateField** passes this method a string instead, so that needs parsing. The finalreturn handles when **value** is **None**, meaning we don't have any defaults for our subwidgets.

The default implementation of value\_from\_datadict() returns a list of values corresponding to each Widget. This is appropriate when using a MultiWidget with a MultiValueField. But since we want to use this widget with a PateField, which takes a single value, we have overridden this method. The implementation here combines the data from the subwidgets into a string in the format that PateField expects.

# **Built-in widgets**

Django provides a representation of all the basic HTML widgets, plus some commonly used groups of widgets in thedjango.forms.widgets module, including the input of text, various checkboxes and selectors uploading files, and handling of multi-valued input

# Widgets handling input of text

These widgets make use of the HTML elements input and textarea.

## **TextInput**

#### class TextInput

- input\_type: 'text'
- template\_name: 'django/forms/widgets/text.html'
- Renders as: <input type="text" ...>

## NumberInput

## class NumberInput

- input\_type: 'number'
- template\_name: 'django/forms/widgets/number.html'
- Renders as: <input type="number" ...>

Beware that not all browsers support entering localized numbers in types. Django itself avoids using them for fields having their localize property set to True.

# **EmailInput**

## class EmailInput

- input\_type: 'email'
- template\_name: 'django/forms/widgets/email.html'
- Renders as: <input type="email" ...>

### **URLInput**

#### class URLInput

- input\_type: 'url'
- template\_name: 'django/forms/widgets/url.html'
- Renders as: <input type="url" ...>

## **PasswordInput**

## class PasswordInput

- input\_type: 'password'
- template\_name: 'django/forms/widgets/password.html'
- Renders as: <input type="password" ...>

Takes one optional argument:

### render\_value

Determines whether the widget will have a value filled in when the form is re-displayed after a validation error (default is also).

### **HiddenInput**

### class HiddenInput

- input\_type: 'hidden'
- template\_name: 'django/forms/widgets/hidden.html'
- Renders as: <input type="hidden" ...>

Note that there also is a MultipleHiddenInput widget that encapsulates a set of hidden input elements.

### **DateInput**

#### class DateInput

- input\_type: 'text'
- template\_name: 'django/forms/widgets/date.html'
- Renders as: <input type="text" ...>

Takes same arguments as **TextInput**, with one more optional argument:

## format

The format in which this field's initial value will be displayed.

If no format argument is provided, the default format is the first format found in DATE\_INPUT\_FORMATS and respects Format localization.

## **DateTimeInput**

#### class DateTimeInput

- input\_type: 'text'
- template\_name: 'django/forms/widgets/datetime.html'
- Renders as: <input type="text" ...>

Takes same arguments as **TextInput**, with one more optional argument:

## format

The format in which this field's initial value will be displayed.

If no format argument is provided, the default format is the first format found in DATETIME\_INPUT\_FORMATS and respects Format localization.

By default, the microseconds part of the time value is always set to **0**. If microseconds are required, use a subclass with the **supports\_microseconds** attribute set to **True**.

## **TimeInput**

## class TimeInput

- input\_type: 'text'
- template\_name: 'django/forms/widgets/time.html'

Renders as: <input type="text" ...>

Takes same arguments as **TextInput**, with one more optional argument:

#### format

The format in which this field's initial value will be displayed.

If no format argument is provided, the default format is the first format found inTIME\_INPUT\_FORMATS and respects Format localization.

For the treatment of microseconds, see DateTimeInput.

#### **Textarea**

#### class Textarea

- template\_name: 'django/forms/widgets/textarea.html'
- Renders as: <textarea>...</textarea>

# Selector and checkbox widgets

These widgets make use of the HTML elements<select>, <input type="checkbox">, and <input type="radio">.

Widgets that render multiple choices have anoption\_template\_name attribute that specifies the template used to render each choice. For example, for the Select widget, select\_option.html renders the <option> for a <select>.

### CheckboxInput

## class CheckboxInput

- input\_type: 'checkbox'
- template\_name: 'django/forms/widgets/checkbox.html'
- Renders as: <input type="checkbox" ...>

Takes one optional argument:

## check\_test

A callable that takes the value of the CheckboxInput and returns True if the checkbox should be checked for that value.

### Select

#### class Select

- template\_name: 'django/forms/widgets/select.html'
- option\_template\_name: 'django/forms/widgets/select\_option.html'
- Renders as: <select><option ...>...</select>

### choices

This attribute is optional when the form field does not have a**choices** attribute. If it does, it will override anything you set here when the attribute is updated on the **Field**.

## NullBooleanSelect

## class NullBooleanSelect

- template\_name: 'django/forms/widgets/select.html'
- option\_template\_name: 'django/forms/widgets/select\_option.html'

Select widget with options 'Unknown', 'Yes' and 'No'

## SelectMultiple

## class SelectMultiple

- template\_name: 'django/forms/widgets/select.html'
- option\_template\_name: 'django/forms/widgets/select\_option.html'

Similar to Select, but allows multiple selection: <select multiple>...</select>

#### RadioSelect

#### class RadioSelect

- template\_name: 'django/forms/widgets/radio.html'
- option\_template\_name: 'django/forms/widgets/radio\_option.html'

Similar to **Select**, but rendered as a list of radio buttons within**t**ags:

```
     <!ii><input type="radio" name="...">
          ...
```

For more granular control over the generated markup, you can loop over the radio buttons in the template. Assuming a form with a field beatles that uses a RadioSelect as its widget:

```
{% for radio in myform.beatles %}

<div class="myradio">
     {{ radio }}

</div>
{% endfor %}
```

This would generate the following HTML:

```
<div class="myradio">
    <label for="id_beatles_0"><input id="id_beatles_0" name="beatles" type="radio" value="john" required>
John</label>
</div>
<div class="myradio">
    <label for="id_beatles_1"><input id="id_beatles_1" name="beatles" type="radio" value="paul" required>
Paul</label>
</div>
<div class="myradio">
    <label for="id_beatles_2"><input id="id_beatles_2" name="beatles" type="radio" value="george" required>
George</label>
</div>
<div class="myradio">
    <label for="id_beatles_3"><input id="id_beatles_3" name="beatles" type="radio" value="ringo" required>
Ringo</label>
</div>
```

That included the **<label>** tags. To get more granular, you can use each radio button'stag, choice\_label and id\_for\_label attributes. For example, this template...

...will result in the following HTML:

If you decide not to loop over the radio buttons - e.g., if your template includes { myform.beatles }} - they'll be output in a

 tags, as above.

The outer container receives the id attribute of the widget, if defined, orBoundField.auto\_id otherwise.

When looping over the radio buttons, the label and input tags include for and id attributes, respectively. Each radio button has anid\_for\_label attribute to output the element's ID.

## CheckboxSelectMultiple

class CheckboxSelectMultiple

- template\_name: 'django/forms/widgets/checkbox\_select.html'
- option\_template\_name: 'django/forms/widgets/checkbox\_option.html'

Similar to **SelectMultiple**, but rendered as a list of checkboxes:

```
    <iiput type="checkbox" name="..." >
    ...
```

The outer container receives the id attribute of the widget, if defined, orBoundField.auto\_id otherwise.

Like **RadioSelect**, you can loop over the individual checkboxes for the widget's choices. Unlike **RadioSelect**, the checkboxes won't include the **required** HTML attribute if the field is required because browser validation would require all checkboxes to be checked instead of at least one.

When looping over the checkboxes, the label and input tags include for and id attributes, respectively. Each checkbox has an id\_for\_label attribute to output the element's ID.

# File upload widgets

## **FileInput**

### class FileInput

- template\_name: 'django/forms/widgets/file.html'
- Renders as: <input type="file" ...>

#### ClearableFileInput

### class ClearableFileInput

- template\_name: 'django/forms/widgets/clearable\_file\_input.html'
- Renders as: <input type="file" ... > with an additional checkbox input to clear the field's value, if the field is not required and has initial data.

# **Composite widgets**

## MultipleHiddenInput

### class MultipleHiddenInput

- template\_name: 'django/forms/widgets/multiple\_hidden.html'
- Renders as: multiple <input type="hidden" ...> tags

A widget that handles multiple hidden widgets for fields that have a list of values.

## **SplitDateTimeWidget**

# class SplitDateTimeWidget

• template\_name: 'django/forms/widgets/splitdatetime.html'

Wrapper (using MultiWidget) around two widgets: **DateInput** for the date, and **TimeInput** for the time. Must be used with **SplitDateTimeField** rather than **DateTimeField**.

**SplitDateTimeWidget** has several optional arguments:

date\_format

Similar to **DateInput.format** 

time\_format

Similar to TimeInput.format

date\_attrs

time\_attrs

Similar to **Widget.attrs**. A dictionary containing HTML attributes to be set on the rendered **DateInput** and **TimeInput** widgets, respectively. If these attributes aren't set, **Widget.attrs** is used instead.

## **SplitHiddenDateTimeWidget**

## class SplitHiddenDateTimeWidget

• template\_name: 'django/forms/widgets/splithiddendatetime.html'

Similar to **SplitDateTimeWidget**, but uses **HiddenInput** for both date and time.

## SelectDateWidget

## class SelectDateWidget

template\_name: 'django/forms/widgets/select\_date.html'

Wrapper around three **Select** widgets: one each for month, day, and year.

Takes several optional arguments:

#### years

An optional list/tuple of years to use in the "year" select box. The default is a list containing the current year and the next 9 years.

## months

An optional dict of months to use in the "months" select box.

The keys of the dict correspond to the month number (1-indexed) and the values are the displayed months:

```
MONTHS = {
    1:_('jan'), 2:_('feb'), 3:_('mar'), 4:_('apr'),
    5:_('may'), 6:_('jun'), 7:_('jul'), 8:_('aug'),
    9:_('sep'), 10:_('oct'), 11:_('nov'), 12:_('dec')
}
```

#### empty\_label

If the <u>DateField</u> is not required, <u>SelectDateWidget</u> will have an empty choice at the top of the list (which is--- by default). You can change the text of this label with the <u>empty\_label</u> attribute. <u>empty\_label</u> can be a <u>string</u>, <u>list</u>, or <u>tuple</u>. When a string is used, all select boxes will each have an empty choice with this label. If <u>empty\_label</u> is a <u>list</u> or <u>tuple</u> of 3 string elements, the select boxes will have their own custom label. The labels should be in this order ('year\_label', 'month\_label', 'day\_label').

```
# A custom empty label with string
field1 = forms.DateField(widget=SelectDateWidget(empty_label="Nothing"))

# A custom empty label with tuple
field1 = forms.DateField(
    widget=SelectDateWidget(
        empty_label=("Choose Year", "Choose Month", "Choose Day"),
    ),
    ),
)
```

← The form rendering
API

Form and field validation

>

**▲ BACK TO TOP** 

# Support Django!

### Contents



## Specifying widgets

- o Setting arguments for widgets
- Widgets inheriting from the Select widget
- · Customizing widget instances
  - Styling widget instances
  - Styling widget classes
- Base widget classes
  - Widget
  - MultiWidget
- o Built-in widgets
  - Widgets handling input of text
    - TextInput
    - NumberInput
    - <u>EmailInput</u>
    - <u>URLInput</u>
    - PasswordInput
    - HiddenInput
    - DateInput
    - DateTimeInput
    - <u>TimeInput</u>
    - <u>Textarea</u>
  - Selector and checkbox widgets
    - CheckboxInput
    - Select
    - NullBooleanSelect
    - <u>SelectMultiple</u>
    - <u>RadioSelect</u>
    - <u>CheckboxSelectMultiple</u>
  - File upload widgets
    - FileInput
    - <u>ClearableFileInput</u>
  - Composite widgets
    - MultipleHiddenInput
    - SplitDateTimeWidget
    - <u>SplitHiddenDateTimeWidget</u>
    - SelectDateWidget

## **Browse**

- Prev: <u>The form rendering API</u>
- Next: Form and field validation
- Table of contents

Python Module Index
You are here:
Django 3.0 documentation
• API Reference
■ <u>Forms</u>
<ul><li>Widgets</li></ul>
Getting help
FAQ Try the FAQ — it's got answers to many common questions.
Index, Module Index, or Table of Contents Handy when looking for specific information.
django-users mailing list Search for information in the archives of the django-users mailing list, or post a question.
#django IRC channel Ask a question in the #django IRC channel, or search the IRC logs to see if it's been asked before.
Ticket tracker Report bugs with Django or Django documentation in our ticket tracker.
Download:
Offline (Django 3.0): <u>HTML   PDF   ePub</u> Provided by <u>Read the Docs</u> .
Learn More
About Django
Getting Started with Django
Team Organization
Django Software Foundation
Code of Conduct
Diversity Statement
Get Involved

• General Index

Contribute to Django

Follow Us	
GitHub	
Twitter	
News RSS	
Django Users Mailing List	
django	
Hosting by rockspace.	
Design by	
thr <del>se</del> spot. &	Getting Help
andrevv	Language: en

Documentation version: 3.0