Validating Forms

Built-in Validators

Form Level Validation

Custom Validator

Field Level Validation

Validating Forms - Form Level Validation

- In forms.py

```
from django import forms
from django.core.exceptions import ValidationError

class ContactForm(forms.Form):

    subject = forms.CharField(max_length=100, required=True)
    message = forms.CharField(widget=forms.Textarea)
    sender = forms.EmailField()
    cc_myself = forms.BooleanField(required=False)


    def myclean(self):
     cleaned_data = super(ContactForm, self).clean()

     email = cleaned_data.get('sender')
     dom = 'gmail.com'

     if dom not in email:
          print('here')
          raise ValidationError('incorrect domain')
```

Validating Forms - Form Level Validation

- In views.py

```
from django.shortcuts import render
from django.http import HttpResponse

from .forms import ContactForm

# Create your views here.
def page(request):

    if request.method == 'POST':

        form = ContactForm(request.POST)
        if form.is_valid():
            form.myclean()
            return HttpResponse('thanks')

    else:

        form = ContactForm()
        context = {'form': form}

        return render(request, 'home.html', context)
```

Validating Forms - Form Level Validation

- In home.html

```
<form method='POST'>
{% csrf_token %}
{{ form }}

<input type="submit" value="submit">
</form>
```

Validating Forms - Field Level Validation

- In forms.py

forms.py

```
from django import forms
from django.core.exceptions import ValidationError

class ContactForm(forms.Form):

    subject = forms.CharField(max_length=100, required=True)
    message = forms.CharField(widget=forms.Textarea)
    sender = forms.EmailField()
    cc_myself = forms.BooleanField(required=False)


    def field_validation(self):
        email = self.cleaned_data.get('sender')
        dom = 'gmail.com'
        if dom not in email:
            raise ValidationError('field validation failed')
```

Validating Forms - Field Level Validation

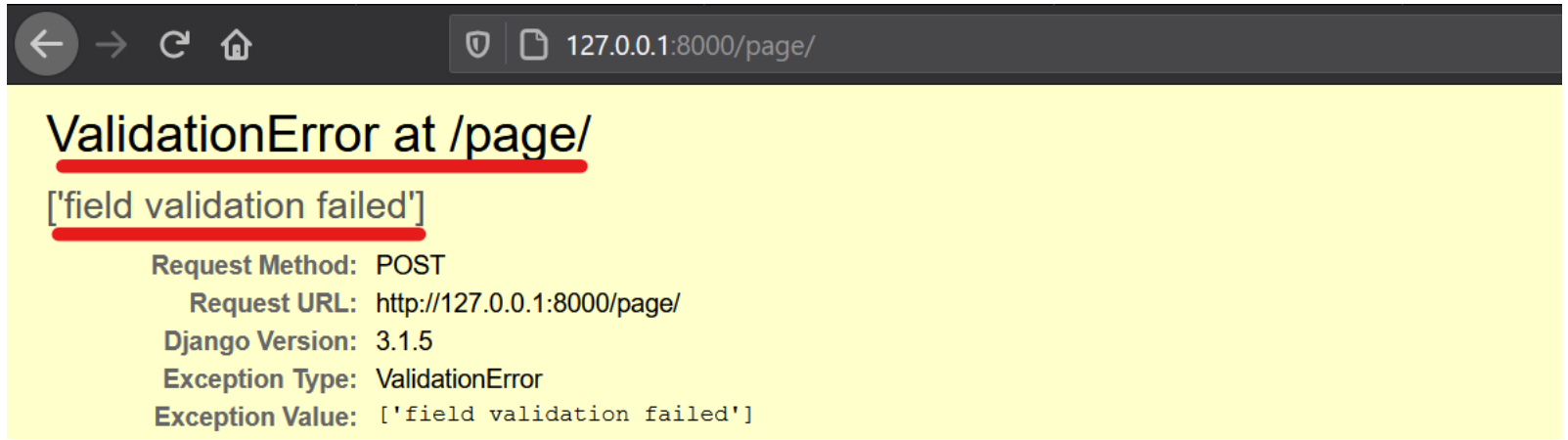
- In forms.py

views.py

```
from django.shortcuts import render
from django.http import HttpResponse

from .forms import ContactForm


def page(request):
    if request.method == 'POST':
        form = ContactForm(request.POST)
        if form.is_valid():
            form.field_validation()
            return HttpResponse('thanks')

    else:
        form = ContactForm()
        context = {'form': form}
        return render(request, 'home.html', context)
```

Validating Forms - Field Level Validation

- If sender has any mail domain other than gmail.com



Forms - Built-in fields

Built-in Fields

- BooleanField
- CharField
- ChoiceField
- TypeChoiceField
- DateField
- DateTimeField
- DecimalField
- DurationField
- EmailField
- FileField
- FilePathField
- FloatField
- ImageField
- IntegerField
- JSONField
- URLField

More:
https://docs.djangoproject.com/en/3.1/ref/forms/fields/#built-in-field-classes

Forms - Built-in fields

forms.py

```
from django import forms

class myForm(forms.Form):
    x1 = forms.BooleanField(required=False)
    x2 = forms.CharField(min_length = 2, max_length = 10,
required=False)

    x = (('s', 'small'),
        ('m', 'medium'))
    x3 = forms.ChoiceField(choices=x)

    x = (('1', '10'),
        ('1', '20'))
    x4 = forms.TypedChoiceField(choices=x,coerce=int)
```

Forms - Built-in fields

forms.py

Contd…

```
    x5 = forms.DateField(required=False)
    x6 = forms.DateTimeField(required=False)
    x7 = forms.DecimalField(required=False)
    x8 = forms.DurationField(required=False)
    x9 = forms.EmailField(required=False)
    x10 = forms.FileField(required=False)
    x11 =
forms.FilePathField(allow_folders=True,path=r'C:\Users\harulp663
\Desktop\practice\myproj', required=False)
    x12 = forms.FloatField(required=False)
    x14 = forms.IntegerField(required=False)
    x15 = forms.JSONField(required=False)
    x16 = forms.URLField(required=False)
```

Forms - Built-in fields

Home.html

```
<form method='POST' enctype="multipart/form-data">
{% csrf_token %}
{{ form }}

<input type="submit" value="submit">
</form>
```

Forms - Built-in fields

Views.py

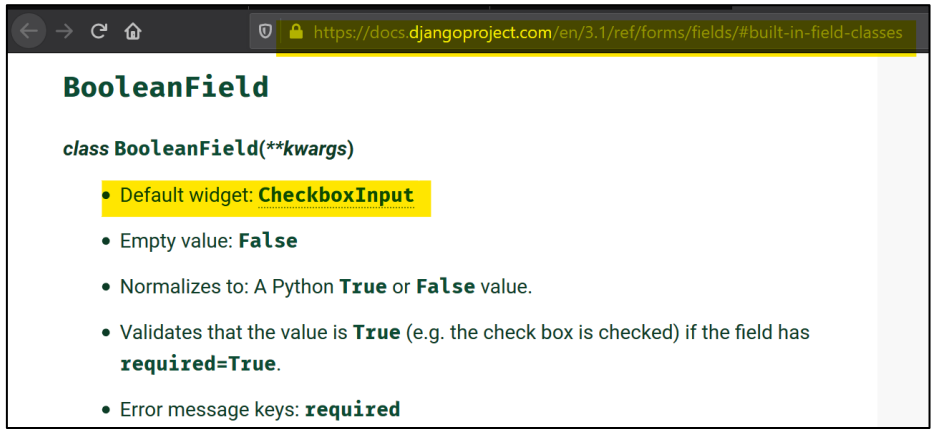
```
from django.shortcuts import render
from django.http import HttpResponse

from .forms import myForm


def page(request):
    if request.method == 'POST':
        form = myForm(request.POST,request.FILES)
        if form.is_valid():
            values = form.clean()
            print(values)
            return HttpResponse('check ur command prompt')
        else:
            return HttpResponse('not valid form')

    else:
        form = myForm()
        context = {'form': form.as_ul}
        return render(request, 'home.html', context)
```

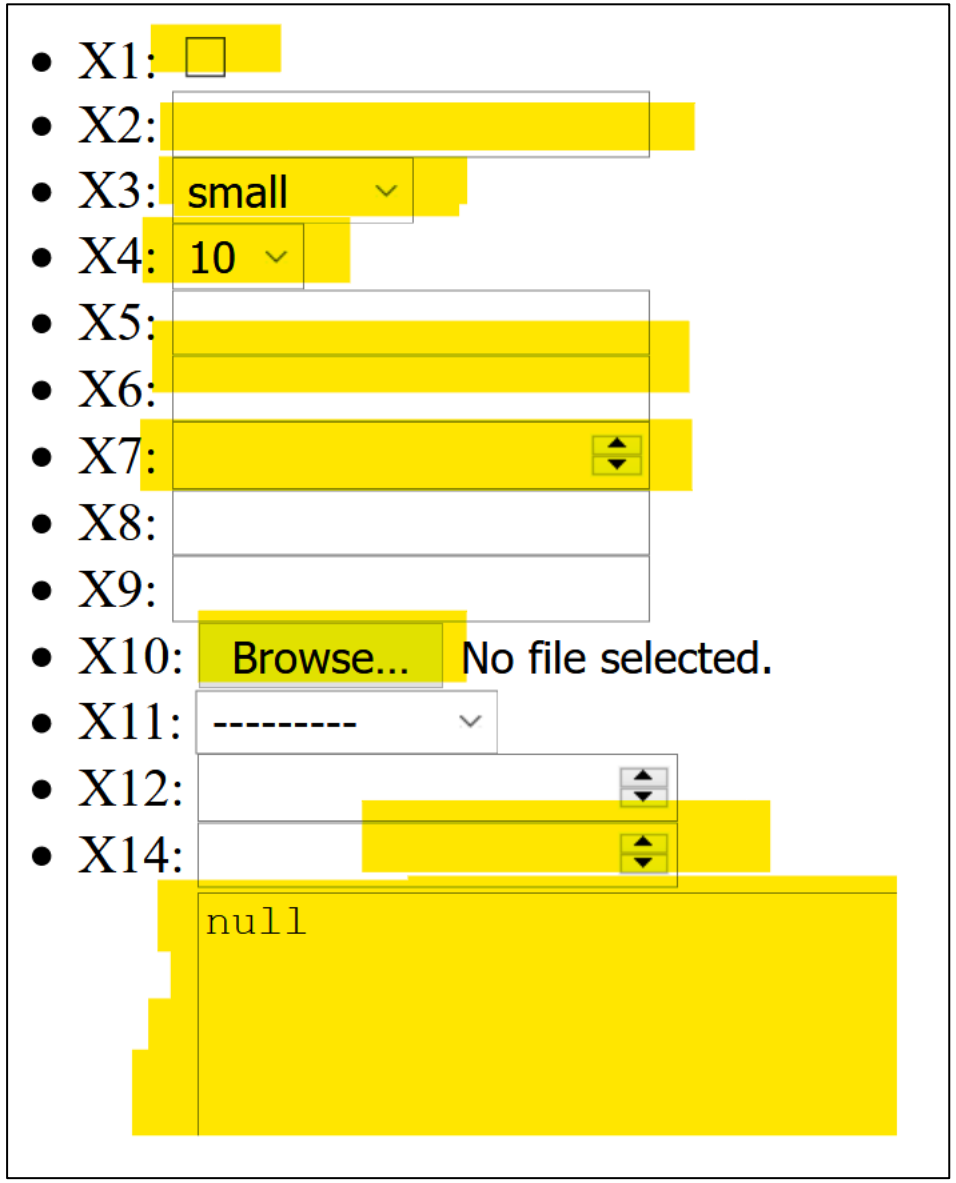
Forms - Built-in widgets

Built-in widgets

Highlighted some widgets in the diagram

- Whenever a built-in field is used, there is a default widget used





Forms - Built-in widgets

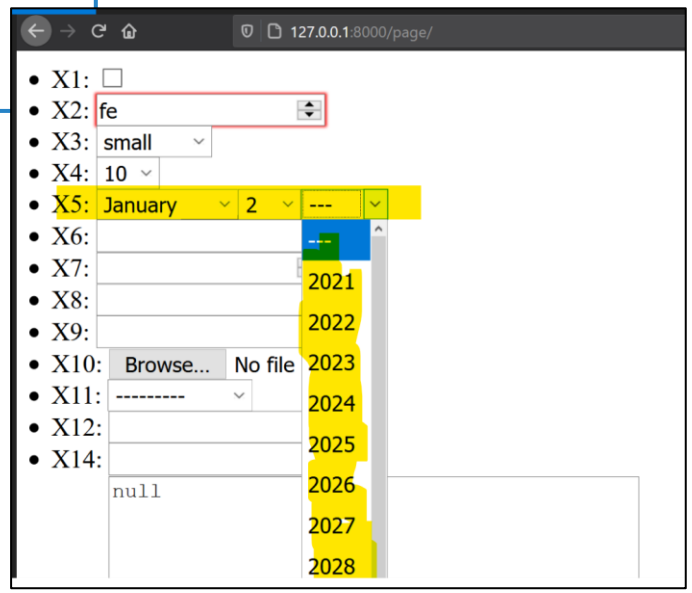
- **Widgets handling input of text**
  - TextInput
  - NumberInput
  - EmailInput
  - URLInput
  - PasswordInput
  - HiddenInput
  - DateInput
  - DateTimeInput
  - TimeInput
  - TextArea
- **Selector and checkbox widgets**
  - CheckBoxInput
  - Select
  - NullBooleanSelect
  - SelectMultiple
  - RadioSelect
  - CheckboxSelectMultiple
- **File upload widgets**
  - File Input
  - ClearableFileInput

More: https://docs.djangoproject.com/en/3.1/ref/forms/widgets/#built-in-widgets

Forms - Built-in widgets

forms.py

```
from django import forms

class myForm(forms.Form):
    x5 = forms.DateField( required=False,
                          widget=forms.SelectDateWidget)
```



Model form

- For database-driven app
- Using models to create a form

models.py

```
from django.db import models

# Create your models here.
class member(models.Model):
    first_name= models.CharField(max_length=30)
    last_name= models.CharField(max_length=30)
```

Model form

forms.py

```
from django.forms import ModelForm
from .models import member


class myModelForm(ModelForm):
    class Meta:
        model = member
        fields = ["first_name", "last_name"]
```

Model form

views.py

```
from django.shortcuts import render
from django.http import HttpResponse

from .forms import myModelForm
from .models import member


def page(request):
    if request.method == 'POST':
        form = myModelForm(request.POST)
        if form.is_valid():
            form.save()
            values = form.clean()
            print(values)
            return HttpResponse('check ur command prompt')
        else:
            return HttpResponse('not valid form')

    else:
        form = myModelForm()
        context = {'form': form}
        return render(request, 'home.html', context)
```

Model form

- You can save the form data to the DB

views.py

```
form = myModelForm(request.POST)
if form.is_valid():
    form.save()
```

- Suppose update an existing record in db?

views.py

```
x = member.objects.get(first_name="BEULAH S")
form = myModelForm(request.POST, instance=x)
if form.is_valid():
    form.save()
```

Form sets

- Suppose you need the same form to be displayed n times – use formset

views.py

```
from django.forms import formset_factory

myFormSet = formset_factory(myModelForm, extra=2)
context = {'form': myFormSet}
return render(request, 'home.html', context)
```

- Output

First name: Last name: First name: Last name:
submit

File upload

- In forms you need FileField
- You need to bind the file ……
  - With post method add request.files
  - In template html file add encytpe in form tag
- Write a function which reads that file and write to someother location

File upload

forms.py

```
from django import forms

class myForm(forms.Form):
    x = forms.FileField()
```

Index.html

```
<form method='POST' enctype="multipart/form-data">
{% csrf_token %}
{{ form }}

<input type="submit" value="submit">
</form>
```

File upload

forms.py

```
from django.shortcuts import render
from .forms import myForm


def handle_file(f):
    with open('myfile.pdf', 'wb+') as fp:
        for chunk in f.chunks():
            fp.write(chunk)

def page(request):
    if request.method == 'POST':
        form = myForm(request.POST, request.FILES)
        handle_file(request.FILES['x’])
    else:
        form = myForm()
        return render(request, 'home.html', {'form': form})
```

Output:

- A new file would have been created at your project directory

Models Layer

-

Accessing related objects

Relation

- One-to-many
- Many-to-many

How ?

- ForeignKey for one-to-many
- ManyToManyField for many-to-many

Models Layer

-

Accessing related objects

one-to-many

Models.py

```
from django.db import models

# Create your models here.
class Mother(models.Model):
    name = models.CharField(max_length=10, null=True)
    num_children = models.IntegerField(null=True)

    def __str__(self):
        return self.name


class Child(models.Model):
    mother = models.ForeignKey(Mother, on_delete=models.CASCADE,
null=True)

    name = models.CharField(max_length=10, null=True)
    age = models.IntegerField(null=True)
    def __str__(self):
        return self.name
```

Models Layer

-

Accessing related objects

one-to-many

Python manage.py shell

```
>>> from myapp.models import Mother
>>> from myapp.models import Child
>>>
>>>
>>> m = Mother(name="Angelina", num_children=6)
>>> m.save()
>>>
>>> c1 = Child(name="Maddox", age=10, mother=m)
>>> c1.save()
>>> c2 = Child(name="Zahara", age=12, mother=m)
>>> c2.save()
```

```
sqlite> select * from myapp_mother;
3|Angelina|6
sqlite>
sqlite>
sqlite> select * from myapp_child;
4|2|10|Krishnan
5|2|12|SriDevi
6|3|10|Maddox
7|3|12|Zahara
```

Models Layer

-

Accessing related objects

one-to-many

- Accessing mother through child

Python manage.py shell

```
>>> x = Child.objects.get(id=6)
>>> x
<Child: Maddox>
>>> x.mother
<Mother: Angelina>
>>> x.mother.name
'Angelina'
>>> x.name
'Maddox'
```

Models Layer

-

Accessing related objects

one-to-many

- Accessing child through mother

Python manage.py shell

```
>>> x = Mother.objects.get(id=3)
>>> x.child_set.all()
<QuerySet [<Child: Maddox>, <Child: Zahara>]>
```

Models Layer

-

Accessing related objects

one-to-many

- creating a relation without save() explicitly called

Python manage.py shell

```
>>> c3 = x.child_set.create(name="Shiloh", age=13)
>>> x.child_set.all()
<QuerySet [<Child: Maddox>, <Child: Shiloh>]>
```

Models Layer

-

Accessing related objects

one-to-many

- Removing a relation

Python manage.py shell

```
>>> x = Mother.objects.get(id=3)
>>> x.child_set.all()
<QuerySet [<Child: Maddox>, <Child: Zahara>]>
>>> x.child_set.remove(c2)
>>> x.child_set.all()
<QuerySet [<Child: Maddox>]>
```

Models Layer

-

Accessing related objects

one-to-many

- adding a relation

Python manage.py shell

```
>>> c2 = Child.objects.get(id=7)
>>> c2
<Child: Zahara>
>>> x
<Mother: Angelina>
>>> x.child_set.all()
<QuerySet [<Child: Maddox>, <Child: Shiloh>]>
>>> x.child_set.add(c2)
>>> x.child_set.all()
<QuerySet [<Child: Maddox>, <Child: Zahara>, <Child: Shiloh>]>
```

Models Layer

-

Accessing related objects

many-to-many

Models.py

```
# many-to-many

class Subject(models.Model):
    name = models.CharField(max_length=10)
    def __str__(self):
        return self.name


class Student(models.Model):
    name = models.CharField(max_length=10)
    subject = models.ManyToManyField(Subject)
    def __str__(self):
        return self.name
```

Models Layer

-

Accessing related objects

many-to-many

Models.py

```
>>> from myapp.models import Subject, Student
>>>
>>> s1 = Subject(name="Tamil")
>>> s1.save()
>>>
>>> s2 = Subject(name="ECA")
>>> s2.save()
>>>
>>> x = Student(name="Jessy")
>>> x.save()
>>> x.subject.set(s)
>>>
>>> x = Student(name="Peter")
>>> x.save()
>>> x.subject.set(s)
```

Authentication

- Authentication – Checking if the user is valid
- Authorization – what the authenticated user is allowed to do

Django built-in authentication

- APPS
  - django.contrib.auth
  - django.contrib.contenttypes
- MIDDLEWARE
  - SessionMiddleware
  - AuthenticationMiddleware

Authentication

Django built-in authentication

USER

- username
- password
- email
- first_name
- last_name

using ***authenticate()***

Authentication

Django built-in authentication

views.py

```
from django.contrib.auth import authenticate

# Create your views here.
def page(request):

    # NOTE: passwords shouldn’t be passed as plain text !
    # usually, we will get this value through a form
    # that it would be passed as a variable value

    user = authenticate(username='admin', password='admin')
    return HttpResponse(user)

    # also username admin and password admin
    # is a weak account as this is a default value
    # in most of the systems and people can easily guess it !!
```

Authentication

- using ***request.user.is_authenticated*** to check if the user is logged-in

Django built-in authentication

- Returns True if the user is logged in
- Returns False if not

Login

Authentication

Django built-in authentication

views.py

```
from django.contrib.auth import authenticate
from django.contrib.auth import login

# Create your views here.
def page(request):

    user = authenticate(username='admin', password='admin’)
    if user:
        login(request, user)
```

logout

Authentication

Django built-in authentication

views.py

```
from django.contrib.auth import authenticate
from django.contrib.auth import login
from django.contrib.auth import logout


# Create your views here.
def page(request):

    user = authenticate(username='admin', password='admin’)
    if user:
        login(request, user)
        # ur logics etc, finally logout ?
        logout(request)
```

Authentication

Password management

- In settings.py - AUTH_PASSWORD_VALIDATORS
- UserAttributeSimilarityValidator

  Checks whether there is similarity between username and password
- MinimumLengthValidator

  Minimum chars to be in a password
- CommonPasswordValidator

  Not a commonly used password, example: admin
- NumericPasswordValidator

  Checks whether the password contains only numbers

Validate password

Authentication

Password management

views.py

```
from django.shortcuts import render
from django.http import HttpResponse

from django.contrib.auth.password_validation import
validate_password

def page(request):
    mypassword = 'admin'
    return HttpResponse(validate_password(mypassword))
```

ValidationError at /page/

['This password is too short. It must contain at least 8 characters.', 'This password is too common.']

Authentication

customizing authentication

Try out - https://docs.djangoproject.com/en/3.1/topics/auth/customizing/#a-full-example

Logging

- Using python inbuilt module logging

views.py

```
from django.shortcuts import render
from django.http import HttpResponse

import logging

# Create your views here.
def page(request):
    logging.basicConfig(level=logging.DEBUG)
    logging.info('page() is invoked’)
    logging.error(‘some error occurred’)

    return HttpResponse('check cmd’)
```