Django Templates Basics

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Templates and DTL

Generate HTML Dynamically

Django Template

- A **text document** (typically an HTML file)
  - where you use the **Django Template Language** to generate content **dynamically**
- Django provides a standard API for **loading** and **rendering** templates:
  - **Loading** involves finding the template file and **performing** any necessary **preprocessing**
  - **Rendering** involves **interpolating** the template with **context** data (variables) and **returning** the resulting string

Django Template Language

- Django features its own **template system**
- Primarily used for expressing **presentation logic**
- This **template system** employs four key **elements**
  - **Variables**
  - **Filters**
  - **Tags**
  - **Comments**

DTL Variables

- Outputs a **value** from the view **context** (dictionary-like object)
- Variables are enclosed within **double curly braces** {{variable_name}}
- There are certain **rules** for naming **variables**:
  - Names **cannot** contain **spaces** or **punctuation** characters
  - A **dot** may **not** be **included** in the name
  - They **cannot** be solely comprised of a **number**
  - Variable attributes that **start** with an **underscore** (_) are **inaccessible**

Example: DTL Variables

- Displaying information for an employee

```
Employee names: {{ first_name }} {{ last_name }}
Department: {{ department }}
Email Adress: {{ email_address }}
```

- Example context

```
context = {
    "first_name": "John",
    "last_name": "Smith",
    "department": "Marketing",
    "email_address": "john.smith@company.com"}
```

Specific DTL Syntax

- Access **dictionary values** by using the **dot notation**

```
{{ some_dictionary.some_key }}
```

- **Call** functions by using them like **regular** variables
  - **No** parenthesis

```
{{ some_function }}
```

```
{{ some_dictionary.items }}
```

Built-in Filters

Filters

- Used to **modify** **variables** **before** they are **displayed**
- To **apply** a **filter** to a **variable**
  - use the **pipe** **symbol** (**|**) followed by the **filter's name**
  - **{{** variable_name**|**filter_name **}}**
- Filters can also be **chained**
  - The **output** of one filter is **passed** as **input** to the next

Filters

- Certain **filters** may require **arguments**
  - Use a **colon** (**:**) followed by the **argument values**
  - **{{** variable_name**|**filter_name**:**argument **}}**
- Django provides a **comprehensive set** of about **sixty built-in** template **filters**
  - to cater to various display **modification needs**

Commonly Used Filters

- Display the **first N chars** of a string (string ends with "...")

```
{{ value|truncatechars:N }}
```

- Display the **first N words** of a string (string ends with "...")

```
{{ value|truncatewords:N }}
```

- **Join** list elements

```
 {{ list|join:", " }}
```

- **Format a date** according to the given format

```
{{ my_date|date:"D d M Y" }}
```

Click here for more date format strings

Commonly Used Filters

- If a variable is **false** or **empty**, use the given **default value**
  - Otherwise, use the value of the variable

```
{{ value|default:"nothing" }}
```

- Returns the **length** of the value (string or list)

```
{{ value|length }}
```

- Formats a float value to the **Nth decimal place**

```
{{ value|floatformat:N }}
```

More built-in filters: *https://docs.djangoproject.com/en/5.2/ref/templates/builtins/#built-in-filter-reference*

Built-in Tags

Tags

- A **template tag** in Django is a **function** that
  - yields a **value** for **display**
- Can also incorporate **custom logic**
  - into the **rendering** process
- Tags are **enclosed** within **{%** and **%}** delimiters

Tags

- Most **tags** can accept **arguments**
  - to further **customize** their **behavior**
- Some **tags** **require**
  - both **opening** and **closing** **tags**
  - to function **properly**

if Tag

- If-tag **evaluates** a variable
  - checks if it is "**true**" (exists, not empty, or not false)
- It requires **opening** and **closing** tags

```
{% if employees_list %}
    Number of employees: {{ employees_list|length }}
{% elif selected_candidates %}
    Number of candidates {{ selected_candidates|length }}
{% else %}
    No employees or candidates!
{% endif %}
```

if Tag

- When constructing conditions, use **Boolean** operators such as "**and**", "**or**" or "**not**"
  - Use of **both** **"and"** and **"or"** clauses within the **same tag** is allowed
  - Note that **"and"** takes **precedence** **over "or"** when used together
  - Use of **parentheses** in the if-tag is an **invalid** syntax

```
{% if employees_list and deparments or selected_candidates %}
    ...
{% endif %}
```

if Tag

- Use operators like:
  - "==", "!=", "<", ">", "<=", ">="
  - "in", "not in", "is", and "is not"
- You can apply **filters** in the if-expressions

```
{% if employees_list|length > 10 %}
    ...
{% endif %}
```

More about Boolean operators: https://docs.djangoproject.com/en/5.2/ref/templates/builtins/#boolean-operators

for Tag

- Requires **both opening** and **closing** tags
- **Optionally**, it can include an **{% empty %}** tag

```
{% for employee in employees %}
    <li>{{ employee.first_name }}</li>
{% empty %}
    <li>No employees in this list.</li>
{% endfor %}
```

url Tag

- Returns a **URL** that **matches** a specified view **along** with **optional** parameters

```
{% url 'show-department-by-id' department.id %}
```

- This **URL** can then be used as a **variable** in your template

```
{% url 'some-view' as var_name %}
{% if var_name %}
  # use the URL
{% endif %}
```

csrf_token Tag

- Provides **Cross-Site Request Forgery** (**CSRF**) protection
- It should be placed **inside** the **<form>** element in your HTML code
- Cross-site request forgeries (**CSRF**) refer to:
  - a type of **malicious exploit**
  - where **unauthorized** commands are **executed** on behalf of **authenticated** users **without** their consent or knowledge

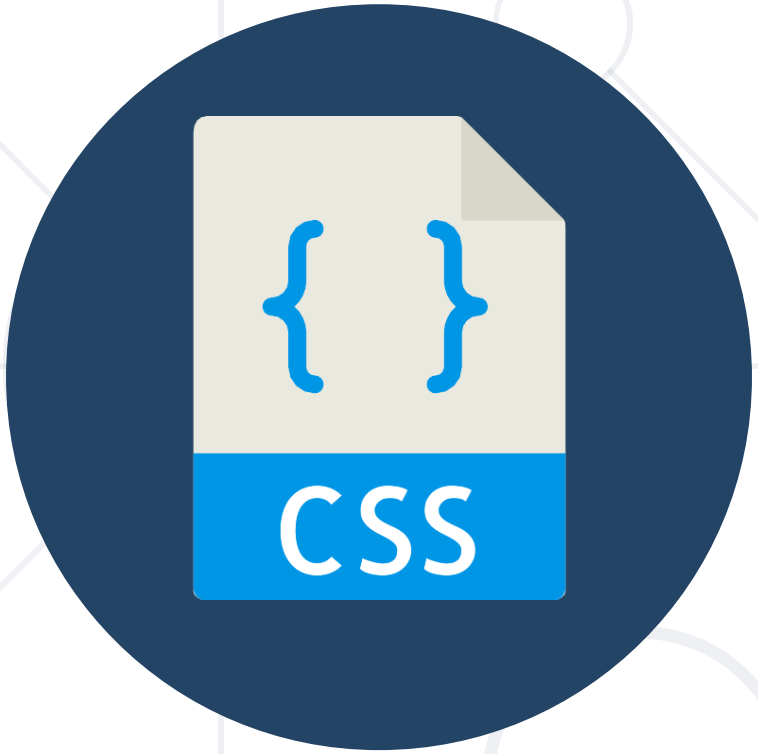
- More about Cross-Site Request Forgery

Comments

- Comments are surrounded by {# and #}
- A **multi-line comment** can be written using a {% comment %} tag

```
{# This is a comment #}

{% comment %}
This is a
multi-line
comment
{% endcomment %}
```

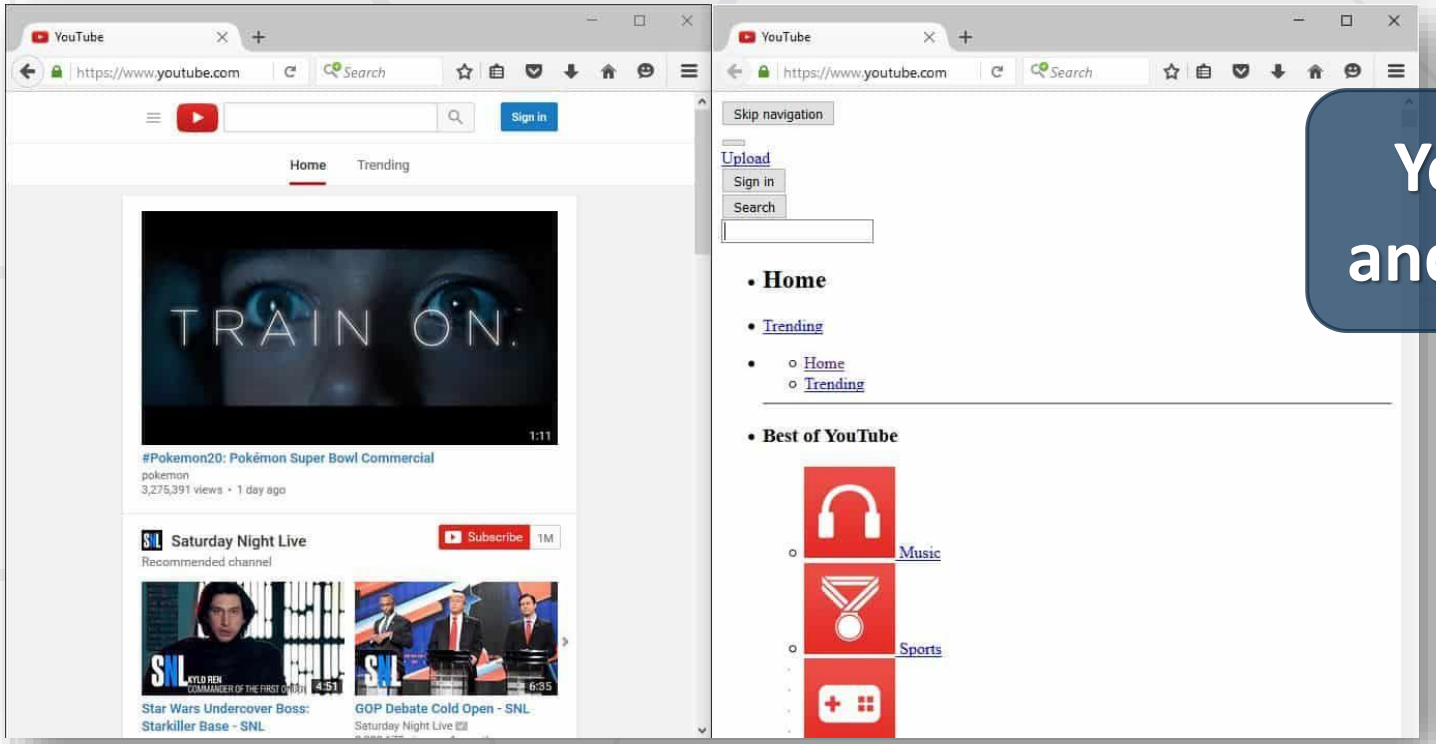


Static Files in Django

Handling Static Files

A Word About Static Files

- Your application will need to **serve external files** like **JavaScript**, **CSS**, and others
- These files are commonly referred to as "**static files**"



Youtube with and without CSS

Set Up a Static File Handling in Django

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- Make sure your **application** is included in the **INSTALLED_APPS** in your project's **settings**
- Ensure you have **defined** the **STATIC_URL** variable in **settings**

```
STATIC_URL = '/static/'
```

- Additionally, make sure you have **specified** the **STATICFILES_DIRS** variable to indicate the **directories** where your static files are **located**

```
STATICFILES_DIRS = [BASE_DIR / 'static',]
```

Using Static Files

- To **include static files** in a Django template
  - you'll need to **load** them

```
{% load static %}
```

- To include a **CSS file** in your HTML template
  - set the stylesheet link's **href attribute** to the **URL** of the **CSS file**

```
{% load static %}
<link rel="stylesheet" href="{% static 'css/style.css' %}"/>
```

Path to the CSS file

Using Static Files

- To **include** an **image** in your HTML template
  - you'll need to **set** the **`src` attribute** of the **`<img>` tag**
  - to the **URL** of the **image file**

```
{% load static %}
<img src="{% static 'my_image.png' %}" alt="My image">
```

Path to the image

Summary

- Templates generate HTML dynamically
- Filters modify variables before displaying
- Template tags are functions
- Static files
  - CSS, JavaScript, images

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