



# Web Development

Technical Summer School 2018, IIT Bombay – Varun Patil

Part 4 – Generating HTML Dynamically



# Static Content

- Everything we've done till now
- HTML on server stays the same – in a file
- Too many pages for similar content
- Can't show user specific content
- Too much to write!



# Dynamic Content

- Generated on the fly
- Can be different depending request parameters like
  - URL
  - User
  - Browser/Operating System
  - Country
- Avoid repetition with **templates**
- Involves server-side processing



# Python

- One of the most popular
- Strongly, dynamically typed language
- Interpreted by the line



# Python – Hello World!


```
$ python --version  
Python 3.6.5
```

```
# hello.py  
print("Hello World!")
```

```
$ python hello.py  
Hello World!
```

# Interactive - CalcAgain

```
def calculate(a, b):  
    """Print the sum and product of two numbers."""  
    print("Sum is ", a + b)  
    print("Product is ", a * b)  
  
# Get inputs  
num1 = float(input("Input 1 - "))  
num2 = float(input("Input 2 - "))  
  
# Print sum and product with a Thank You message  
calculate(num1, num2)  
print("Thank You!")
```



# Interactive - CalcAgain

```
def calculate(a, b):  
    """Print the sum and product of two numbers."""  
    sum = "Sum is " + str(a + b)  
    prod = "Product is " + str(a * b)  
    return sum + "\n" + prod  
  
# Get inputs  
num1 = float(input("Input 1 - "))  
num2 = float(input("Input 2 - "))  
  
# Print sum and product with a Thank You message  
print(calculate(num1, num2))  
print("Thank You!")
```

# Interactive - CalcAgainWrite

```
def calculate(a, b):  
    """Print the sum and product of two numbers."""  
    sum = "Sum is " + str(a + b)  
    prod = "Product is " + str(a * b)  
    return sum + "\n" + prod  
  
# Get inputs  
num1 = float(input("Input 1 - "))  
num2 = float(input("Input 2 - "))  
  
# Write sum and product with a Thank You message  
with open('myfile.txt', 'w') as file:  
    file.write(calculate(num1, num2))  
    file.write("\n")  
    file.write("Thank You")
```





# Interactive - Arrays

```
my_array = [2, 5, 'haha', 89]
```

```
print(my_array[1])
```

```
names = ['Bombay', 'Madras', 'Kanpur', 'Delhi', 'Kharagpur']
```

```
print('Here is a list of some IITs:')
```

```
for name in names:  
    print('IIT', name)
```



# Interactive - Loops

```
# Print 0 to 9
for i in range(0, 10):
    print(i)
```

```
# Print 0 to 9
current = 0
while current < 10:
    print(current)
    current += 1
```

```
# Print 0 to 9 skipping alternately
for i in range(0, 10, 2):
    print(i)
```



# Dictionary

```
my_dict = {  
    'name': 'Jon Snow',  
    'house': 'Stark?',  
    'home': 'Winterfell'  
}  
  
print('My name is', my_dict['name'])  
print('I live in', my_dict['home'])
```

# Interactive – Array of Dicts

```
everyone = [  
    {'name': 'Daenerys', 'house': 'Targaryen', 'home': 'Dragonstone?'},  
    {'name': 'Arya', 'house': 'Stark', 'home': 'Winterfell'},  
    {'name': 'Cersei', 'house': 'Lannister', 'home': 'King's Landing'},  
    {'name': 'Yara', 'house': 'Greyjoy', 'home': 'Iron Islands'}  
]
```

<http://home.iitb.ac.in/~varunpatil/webdev/got-dict.py>

```
for p in everyone:  
    print(p['name'], 'of house', p['house'], 'from', p['home'])
```

# Comma Separated Values

```
name,house,home  
Bran,Stark,Winterfell  
Tyrion,Lannister,King's Landing  
Theon,Greyjoy,Winterfell  
Samwell,Tarly,Horn Hill
```

<http://home.iitb.ac.in/~varunpatil/webdev/got-csv.csv>

```
import csv  
  
with open('got-csv.csv', 'r') as csvfile:  
    dreader = csv.DictReader(csvfile)  
    for p in dreader:  
        print(p['name'], 'of house', p['house'], 'from', p['home'])
```

# Interactive – Dummy HTML

```
def get_html():  
    return """  
    <html>  
        <body>  
            <h1> This is a heading </h1>  
            <p> This is a paragraph </p>  
        </body>  
    </html>  
    """  
  
    # Write HTML  
    with open('dummy.html', 'w') as file:  
        file.write(get_html())
```



# Interactive Product Catalogue

[home.iitb.ac.in/~varunpatil/webdev/data.csv](http://home.iitb.ac.in/~varunpatil/webdev/data.csv)



# Templates

- Files with HTML and some variables
- Variables replaced with actual data
- Makes editing HTML easier
- Liking CSS/JS

```
<body>  
  <h1> {{ heading }} </h1>  
  <p> {{ information }} </p>  
</body>
```





# Interactive Product Catalogue - Template

[home.iitb.ac.in/~varunpatil/webdev/data.csv](http://home.iitb.ac.in/~varunpatil/webdev/data.csv)



# Serving Dynamically

- Store only the template and data
- Create the “rendered” HTML only when asked for
- Instead of saving the HTML, send it to the client
- Allows changing data (very) frequently
- Can recognize user and generate specific content



Thank You!