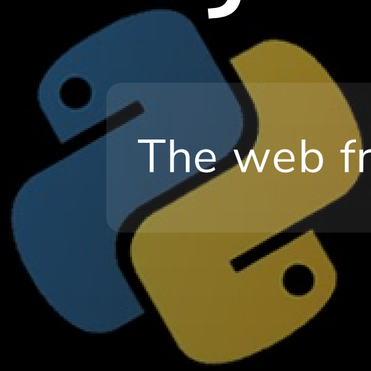
Django

The web framework for perfectionists with deadlines.



Outline

1. Python intro
2. django Basics + models
3. Views, Forms, Templates
4. HTML, CSS, UI.
5. *Bonus #1 Deploying to internet*
6. *Bonus #2 API & react app*

Python basics

Speedrun Python basics

Basic operations (Arithmetic)

```
1 + 2 # Addition

1 - 2 # subtraction

2 * 3 # multiplication

9 / 2 # division

9 // 2 # floor division

2 ** 3 # exponent

5 % 2 # modulus
```

Basic operations (Comparison)

```
2 == 3 #Is it equal?

1 ≠ 2 #Is it NOT equal?

7 < 11 #Is it lesser?

5 > 9 #Is it greater?

67 ⩾ 88 #Is it greater than or equal?

24 ⩽ 666 #Is it lesser than or equal?
```

Basic operations (Logical)

```
(1 < 2) or (3 < 5) #If either of the 2 operations returns true, the final result will also be true

(4 == 3) and (10 ≠ 10) #Both operations need to return true in order for the final result to be true

not (5*3 == 15) #Reversal
```

Variables

```
a = 10

print(a)
```

```
name = "minion"

print(name)
```

```
b = 42
B = "X-rays"

print(b,B)
```

```
D = 22
D = "Ant"

print(D)
```

Data types

Integer

```
int
-1, 2, 0, 1000
```

Float

```
float
0.1, 2.76, -9.45
```

Strings

```
str
'python', 'NAXXATRA', "hello", "wonder"

"""disco""",

"""
this is a multi-line string
"""
```

Boolean

```
bool
True, False
```

None

```
None
```

--

Check type

```
a = 10
type(a)
```

Operations with variables

```
a,b = 10,20 # assign multiple variables
```

try these operations with `a` and `b`

```
print(a + b)

print(a - b)

print(a * b)

print(a / b)

print(a < b)

print(a > b)

print(a == b)
```

```
del a,b #delete variables
```

Strings

```
# Strings are collection of characters
str1 = 'laka '
str2 = 'laka '
print(str1)
print(str2)
```

```
print(str1 + str2)
print(str1 * 5)
```

```
str1.upper(), str2.lower()
```

```
s1 = '1'
s2 = '2'
print(s1 + s2)
```

```
#Indexing (Collections in python are 0-indexed, i.e, the first element's index is 0)
print(str1[2])
```

```
#Slicing - str1[start : stop : step]
print(str1[1:5])
```

Type Conversion

```
a = 10
b = str(a)
c = float(a)
```

```
type(a)
```

```
type(b)
```

```
type(c)
```

```
d = int(b)
```

```
type(d)
```

```
a = input("Enter the first number: ")
type(a)
```

```
a = int(input("Enter the first number: "))
type(a)
```

Lists

Mutable collection of heterogenous items

```
# Mutable collection of heterogenous items
l = [1, 2, 'a', 0.4, False]
```

```
l[2] # accessing by index
```

```
l[2:4] # accessing a slice
```

```
l.append(42) # adding to end of a list
l
```

```
l.append([9,0]) # adding to a list
l
```

Tuples

Immutable collection of items

```
# Immutable collection of items
t = (1, 2, 'a', 0.4, False)
```

```
t[2] # accessing by index
```

```
t[2:4] # accessing a slice
```

we cannot add, remove or modify items from a tuple

Dictionaries

Dictionaries are key value pairs

```
apple = {
    "name": "Apple",
    "price": 100,
    "color": "red"
}
orange = {"name": "orange", "price": 50, "color": "orange"}
```

Dictionaries

Updating dictionaries

```
apple["price"] = 120 # updating a value
```

```
apple["flavour"] = "sweet" # adding a new key-value pair
```

```
apple.update({"calory":125,"type":"natural"}) # updating a dictionary with another dictionary
```

Conditional Statements

```
a, b, c = 10, 20, 30


if (a > b) and (a > c):
    print("a is the largest")
elif (b > a) and (b > c):
    print("b is the largest")
else:
    print("c is the largest")
```

Problem (FizzBuzz)

A practice problem to learn how to use conditional statements.

Fizzbuzz is a problem where you have to print the numbers from 1 to 100.

- But for multiples of 3 print "Fizz" instead of the number
- and for the multiples of 5 print "Buzz".
- For numbers which are multiples of both 3 and 5 print "FizzBuzz".

```
1 # example output
2
Fizz
4
Buzz
Fizz
7
8
Fizz
Buzz
11
Fizz
13
14
FizzBuzz
16
```

Sample Solution

```python
for i in range(1, 101):
    if i % 3 == 0 and i % 5 == 0:
        print("FizzBuzz")
    elif i % 3 == 0:
        print("Fizz")
    elif i % 5 == 0:
        print("Buzz")
    else:
        print(i)
```

Challenge for you

Write the same program but using fewer conditional statements.

Solution 2

```
for i in range(1, 101):
    output = ""
    if i % 3 == 0:
        output += "Fizz"
    if i % 5 == 0:
        output += "Buzz"
    if output == "":
        output = str(i)
    print(output)
```

```
for i in range(1,101):
    string = "".join("Fizz" if (i%3==0) else "")
    string = string + ("Buzz" if (i%5==0) else "")
    print(i if(string=="") else string)
```

```
for number in range(1,101):
    if number % 3 == 0 and number % 5 == 0: result = "FizzBuzz"
    elif number % 3 == 0: result = "Fizz"
    elif number % 5 == 0: result = "Buzz"
    else: result=number
    print(result)
```

Solution 3

```
for i in range(1, 101):
    if i % 3 == 0:
        if i % 5 == 0:
            print("FizzBuzz")
        else:
            print("Fizz")
    elif i % 5 == 0:
        print("Buzz")
    else:
        print(i)
```

```
for number in range(1,101):
    result = number
    if (number % 3 == 0): result = "Fizz"
    if number % 5 == 0:
        if type(result) == str:result += "Buzz"
        else: result = "Buzz"
    print(result)
```

Session 2

Django basics

Django

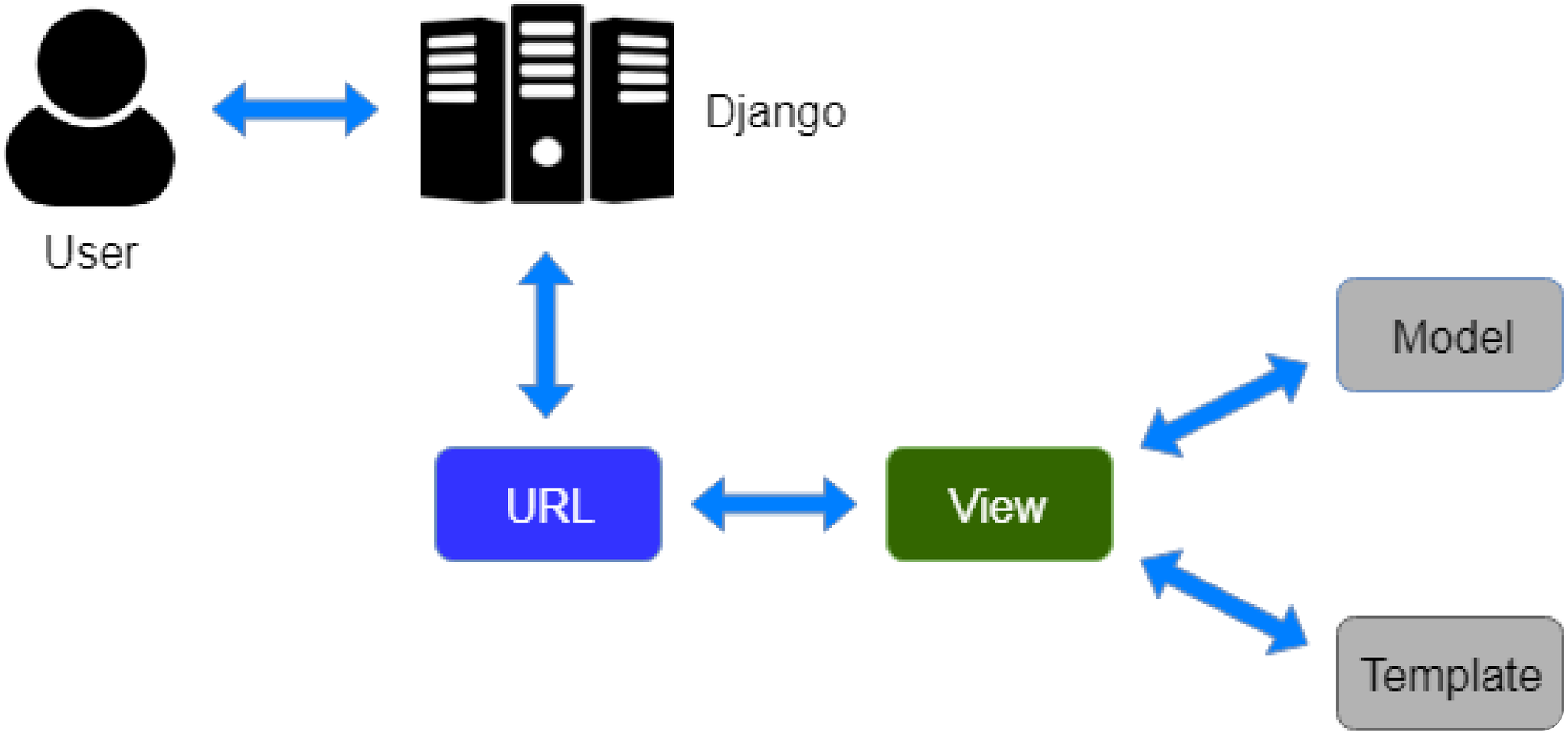
Django is a batteries-included web framework for Python.

- can create robust web applications
- easy to get started and learn
- uses an ORM (Object Relational Mapping)
- uses a Model-View-Template (MVT) pattern
- can be used to create a RESTful API (Representational State Transfer) (REST)
  - `(GET, POST, PUT, DELETE)`

Django ORM

Django ORM is an application layer that allows you to interact with a database without writing any raw SQL.

MVT (model-view-template)



Classes & inheritance

```
class Human:
    def __init__(self, name, age):
        self.name = name
        self.age = age
        self.hands = 2
        self.nose = 1
        self.eyes = 2

    def talk(self):
        print("Hello")

    def run(self):
        print("I am running")
```

```
class Programmer(Human):
    def __init__(self, name, age, language):
        super().__init__(name, age)
        self.language = language

    def code(self):
        print("I am coding")
```

MVT in code

models.py

```
class Post(models.Model):
    title = models.CharField(max_length=200)
    body = models.TextField()
    date = models.DateTimeField(auto_now_add=True)

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

Views

views.py

```
class PostView(View):
    """
    Views for post
    """

    def get(self, request):
        """url to get all posts"""
        posts = Post.objects.all()
        return render(request, 'blog/index.html', {'posts': posts})

    def post(self, request):
        """URL to create a post"""
        title = request.POST.get('title')
        body = request.POST.get('body')
        post = Post(title=title, body=body)
        post.save()
        return redirect('/')
```

Template

blog/index.html

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Document</title>
</head>
<body>
    <h1>Blog</h1>
    <ul>
        {% for post in posts %}
            <li>{{ post.title }}</li>
        {% endfor %}
    </ul>
    <h2> create a post </h2>
    <form action="/blog/create" method="post">
        <input type="text" name="title" placeholder="Title">
        <textarea name="body" cols="30" rows="10" placeholder="Your post"></textarea>
        <button type="submit">Submit</button>
    </form>
</body>
</html>
```

Steps to start

```
# install pip and venv
python3 -m pip install wheel
# upgrade pip
python3 -m pip install -U pip

# install pipenv
python3 -m pip install pipenv
# cd $projectroot/
cd /to/path/of/the-project/

# create virtual environment
pipenv install
# this might take a few minutes
```

Status checks

```
python -V

pip -v

# installing pipenv
pip install pipenv --user

# checking pipenv installation
pipenv -h
```

possible errors:

```
pipenv shell 'pipenv' is not recognized as an internal or external command, operable program or batch file.
```

Windows troubleshooting

1. Press the `Windows key+X` to access the Power User Task Menu.
2. In the Power User Task Menu, select the `` `System` `` option.
3. In the About window, click the `` `Advanced system settings` `` link under `` `Related settings` `` on the far-right side.
4. In the System Properties window, click the Advanced tab, then click the `` `Environment Variables` `` button near the bottom of that tab.
5. In the `` `Environment Variables` `` window, highlight the `` `Path` `` variable in the System variables section and click the `` `Edit` `` button. Add or modify the path lines with the paths you want the computer to access. Each directory path is separated with a semicolon, as shown below.

Second, replace your `` `<username>` `` in the following paths and add them to the PATH environment variable:

```
c:\Users\<username>\AppData\Roaming\Python\Python38\Site-Packages
C:\Users\<username>\AppData\Roaming\Python\Python38\Scripts
```

Getting started

windows instructions

```
# pip install django

py -m pip install Django

# check django version
py -m django --version
```

change into your desired project directory and run the following commands:

```
django-admin startproject blog
```

Run the development server:

```
py manage.py runserver
```

Start a new app

create database

```
py manage.py migrate
```

```
py manage.py startapp posts
```

and create a superuser

```
py manage.py createsuperuser
```