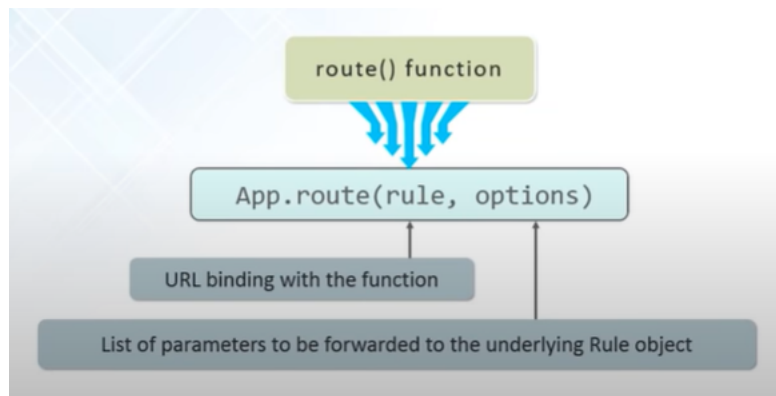# Python : Flask API

Webpage components

▼ What does route function do ?

Route function assosciates each function with its corresponding URL with customized options

URL → Function

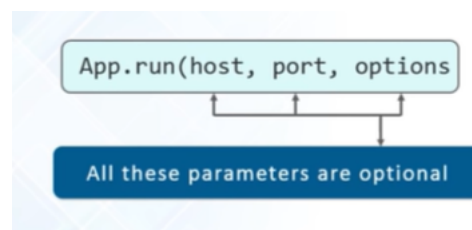▼ How do you create a routing between URL index and function?

```python
from flask import Flask
app = Flask(__name__)

@app.route('/')
def hello_world():
    return 'Hello World'

if __name__ == '__main__':
    app.run()
```

The above function is a simple code that will open "Hello World after running a simple web application.

▼ what does App.run function do ?

| Sl.no	Parameter	Description
1	host	Hostname to listen on. Defaults to 127.0.0.1 (localhost). Set to '0.0.0.0' to have server available externally
2	port	Defaults to 5000
3	debug	Defaults to false. If set to true, provides a debug information
3	options	To be forwarded to underlying Werkzeug server.

It implements the server in a specific way that we need .For exampe we can change the default port or the web forwarding options etc.

▼ Why do we require token authentication?

the traditional model requires the username to provide password to the server and then from there he will have access to his data .

But there could be a risk of hacking .
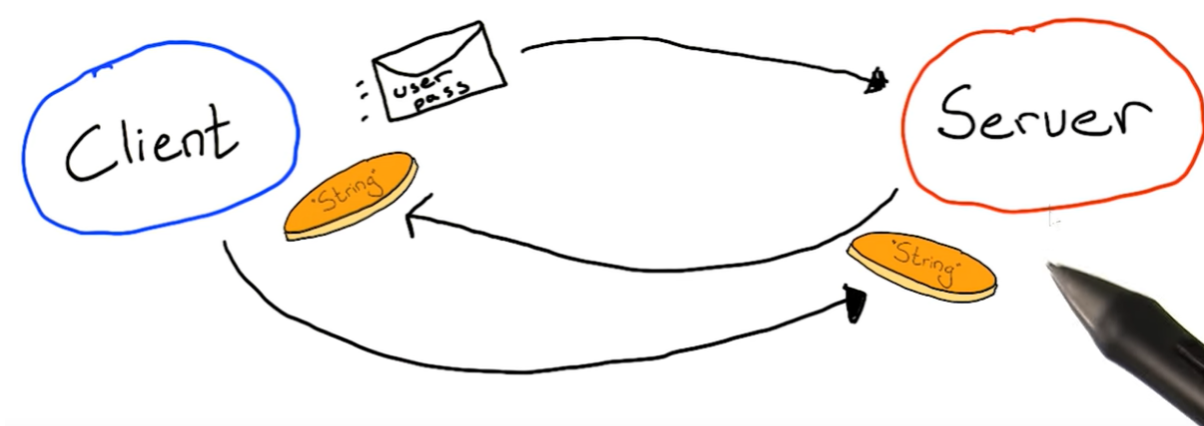
So instead what they did was , when the user gave gives us his credentials ,we create an acces token and give it to him .We tell him **"Hey you can have accesss to you data for 5 minutes if you use this token.".**

So the next time the user wants access . **He doesent have to give his user credentials ,**instead **he could just show his access token** and he will access to all of his data .

▼ How is token authentication more secure than user validation?

The potential risks of a token leak is much smaller than leak of user credentials .
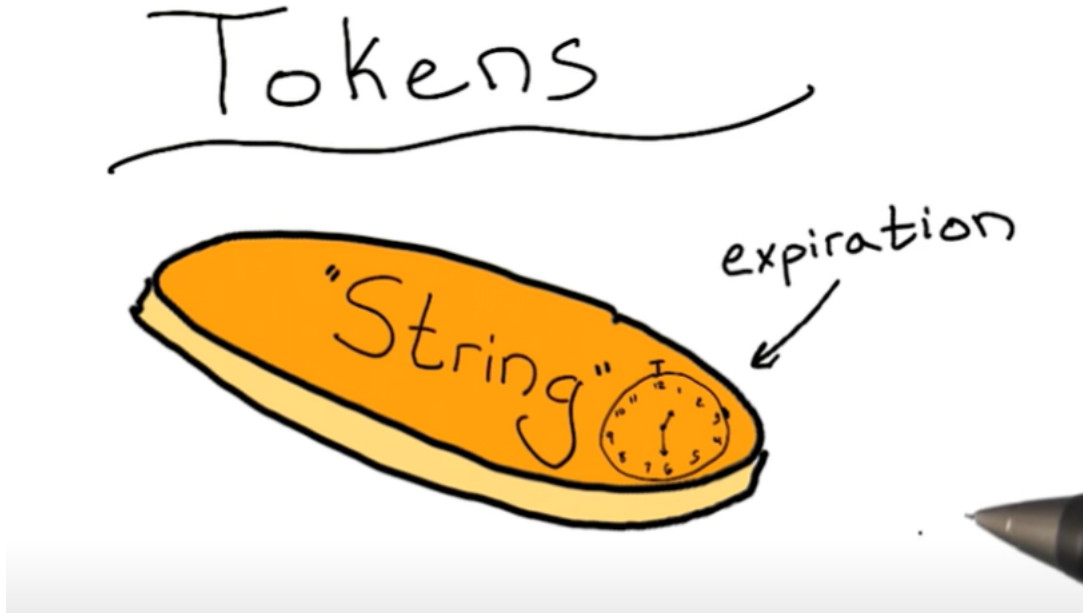
A server can always detect if token is old .But when someone gets hold of user infromation then the risks are much higher .So its better to exchange tokens at regular interals instead of user infomration

Session Tokens

▼ How do we instantiate json web token?

```
import jwt
#For encoding
a = jwt.encode({'data' : 'Hello World','exp': time.time() + 10},'The Sky is a Fox',
     algorithm='HS256')
#For decoding
jwt.decode(a, 'The Sky is a Fox',algorithms=['HS256'])
```

▼ Where do we specify the time out session for the tokens?

```
a = jwt.encode({'data' : 'Hello World','exp': time.time() + 10},'The Sky is a Fox',
     algorithm='HS256')
```

The exp field in the json data correspond to expiry time .Here it means that the session will get expired in 10 seconds.

Webpage components

Radio Buttons

Load data into Radio buttons<from JSON>and fetch data from it multiple selects

▼ Full code

For loading Json data :

```
if request.method=='POST':
    data1=request.form.getlist('data')
    return render_template('RECM_data.html',records = data[::-1],data=data1)
```

```
<u>Radio buttond: </u>
    <form method=post enctype=multipart/form-data  action="{{ url_for('recm_summary')}}">
        <div class="form-check">
          {%for i in records%}
          <input class="form-check-input" type="radio" name="data" id="data" value={{i}}>
          <label class="form-check-label" for="flexRadioDefault1">
            {{i}}
          </label><br>
        </div>
         {%endfor%}<br>
              <input class="btn btn-primary" name="submit" type="submit" value="Submit">
    </form>
```

value={{i}} this is for **fetching actual value** at the code when we **press submit**

{{i}} this is for just displaying the data normally

▼ Complete code

```
@app.route('/recm_summary',methods=['GET','POST'])
def recm_summary():
    os.chdir('/home/Amos/UK_MQTT_Json_Rep/')
    contents = open('ukrecm_data.json', "r").read()
    data = [json.loads(str(item)) for item in contents.strip().split('\n')]
    if request.method=='POST':
        data1=request.form.getlist('data')
        return render_template('RECM_data.html',records = data[::-1],data=data1)

    elif request.method=='GET':
        # print(data[1])
        return render_template('RECM_data1.html',records = data[1])
        response = 'No data since last 5 minutes.Please check that devices are sending data or that script is active'
        return response
```

▼ RECM data_1.html : to display starting data without checkboxes selected

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
<title>Untitled Document</title>
<script src="https://cdn.jsdelivr.net/npm/bootstrap@5.1.1/dist/js/bootstrap.bundle.min.js" integrity="sha384-/bQdsTh/da6pkI1MS
<link href="https://cdn.jsdelivr.net/npm/bootstrap@5.1.1/dist/css/bootstrap.min.css" rel="stylesheet" integrity="sha384-F3w7mX
<style>

.table {
  font-family: Arial, Helvetica, sans-serif;
  border-collapse: collapse;
  width: 100%;
}

.table td, .table th {
  border: 1px solid #ddd;
  padding: 8px;
}

.table th {
  padding-top: 12px;
  padding-bottom: 12px;
  text-align: center;
  background-color: #0069ab;
```

```
  color: white;
}

</style>

</head>

<body>
  <u>Radio buttond: </u>
    <form method=post enctype=multipart/form-data  action="{{ url_for('recm_summary')}}">
          <div class="form-check">
            {%for i in records%}
            <input class="form-check-input" type="radio" name="data" id="data" value={{i}}>
            <label class="form-check-label" for="flexRadioDefault1">
              {{i}}
            </label><br>
          </div>
            {%endfor%}<br>
                <input class="btn btn-primary" name="submit" type="submit" value="Submit">
      </form>

</body>
</html>
```

▼ RECM_data.html : After check boxes have been selected

```
check box:
    <form method=post enctype=multipart/form-data  action="{{ url_for('recm_summary')}}">
        {%for i in records[1]%}
        <div class="form-check form-check-inline">
            <input class="form-check-input" type="checkbox" id="data" name="data" value={{i}}>
            <label class="form-check-label" for="data">{{i}}</label>
        </div>
        {%endfor%}<br>
            <input class="btn btn-primary" name="submit" type="submit" value="Submit">
      </form>

<table class="table">
  <thead>
    {% for i in data %}
    <th align="center" valign="middle">{{i}}</th>
    {%endfor%}
    </thead>
    <tr>
     {%for i in records%}
     {%for j in data%}
     <td align="center" valign="middle">{{i[j]}}</td>
     {%endfor%}
  </tr>

  {%endfor%}
</table>
```
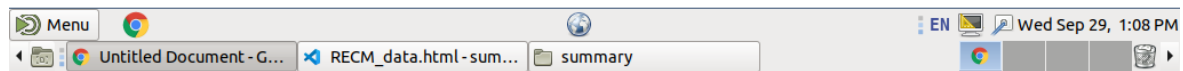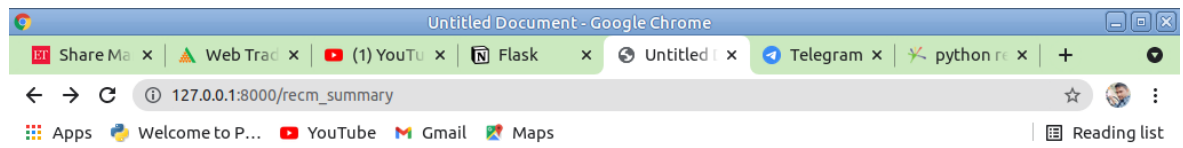
Explanation

For code related to Home page (as soon as you enter page), the following if condition gets excuted
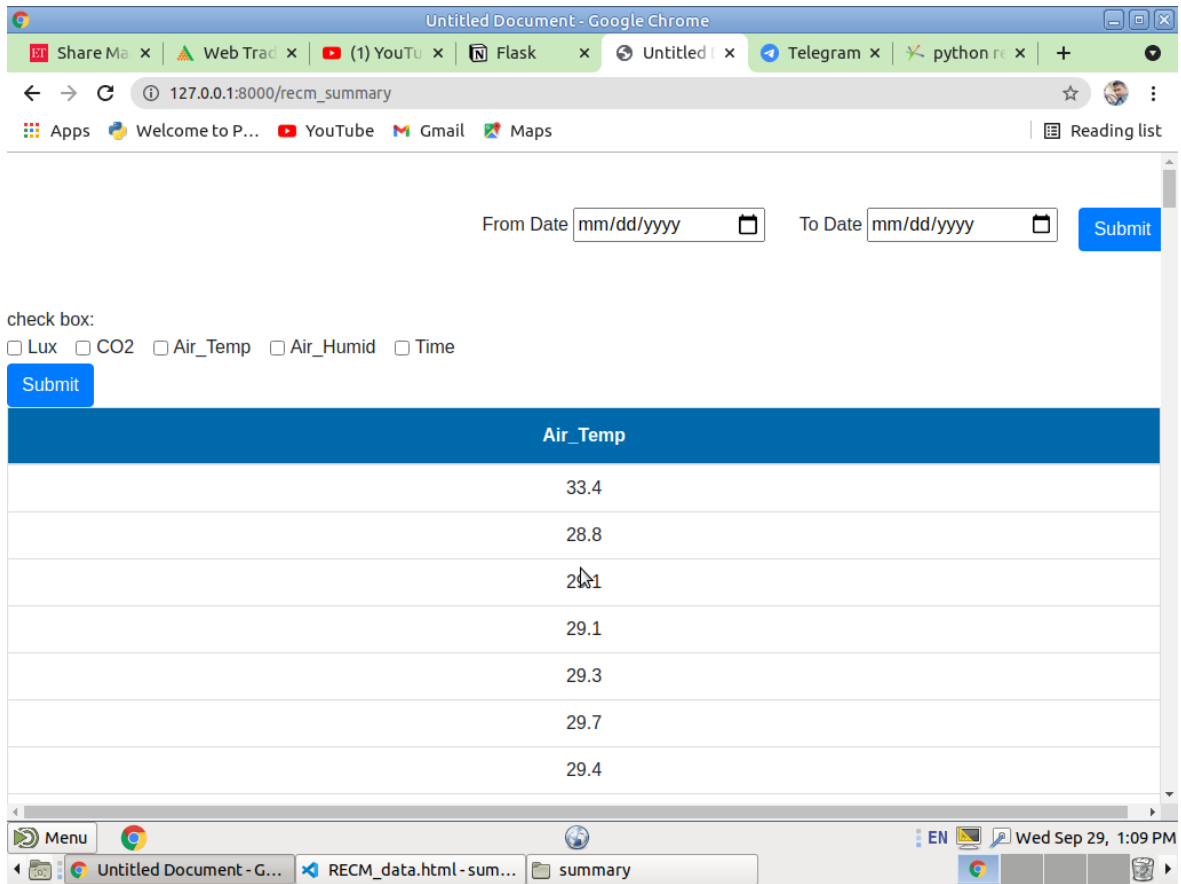
```
elif request.method=='GET':
```

▼ image

Whereas for the once where you have already selected the radio button , the below if condition gets executed is

```
if request.method=='POST':
```

▼ image

Checkboxes

Load data into Checkboxes <from JSON>and fetch data from it multiple selects

Note it is fetching the list data from "name" tag

▼ Complete code

```
@app.route('/recm_summary',methods=['GET','POST'])
def recm_summary():
    os.chdir('/home/Amos/UK_MQTT_Json_Rep/')
    contents = open('ukrecm_data.json', "r").read()
    data = [json.loads(str(item)) for item in contents.strip().split('\n')]
    if request.method=='POST':
        print(request.form.getlist('data'))
        # return render_template('RECM_data.html1',records = data[::-1])
        return '<h1>welcome to my blog page</h1>'

    elif request.method=='GET':
        print(data[1])
        return render_template('RECM_data1.html',records = data[1])
```

▼ RECM data_1.html : to display starting data without checkboxes selected

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
<title>Untitled Document</title>
<script src="https://cdn.jsdelivr.net/npm/bootstrap@5.1.1/dist/js/bootstrap.bundle.min.js" integrity="sha384-/bQdsTh/da6pkI1MST/rWh
<link href="https://cdn.jsdelivr.net/npm/bootstrap@5.1.1/dist/css/bootstrap.min.css" rel="stylesheet" integrity="sha384-F3w7mX95Pd
<style>
```

```
.table {
  font-family: Arial, Helvetica, sans-serif;
  border-collapse: collapse;
  width: 100%;
}

.table td, .table th {
  border: 1px solid #ddd;
  padding: 8px;
}

.table th {
  padding-top: 12px;
  padding-bottom: 12px;
  text-align: center;
  background-color: #0069ab;
  color: white;
}

</style>

</head>

<body>
  <u>Radio buttond: </u>
    <form method=post enctype=multipart/form-data  action="{{ url_for('recm_summary')}}">
        <div class="form-check">
         {%for i in records%}
         <input class="form-check-input" type="radio" name="data" id="data" value={{i}}>
         <label class="form-check-label" for="flexRadioDefault1">
           {{i}}
         </label><br>
        </div>
         {%endfor%}<br>
            <input class="btn btn-primary" name="submit" type="submit" value="Submit">
    </form>

</body>
</html>
```

▼ RECM_data.html : After check boxes have been selected

```
check box:
    <form method=post enctype=multipart/form-data  action="{{ url_for('recm_summary')}}">
        {%for i in records[1]%}
        <div class="form-check form-check-inline">
            <input class="form-check-input" type="checkbox" id="data" name="data" value={{i}}>
            <label class="form-check-label" for="data">{{i}}</label>
        </div>
        {%endfor%}<br>
            <input class="btn btn-primary" name="submit" type="submit" value="Submit">
    </form>

<table class="table">
  <thead>
    {% for i in data %}
    <th align="center" valign="middle">{{i}}</th>
    {%endfor%}
    </thead>
    <tr>
     {%for i in records%}
     {%for j in data%}
     <td align="center" valign="middle">{{i[j]}}</td>
     {%endfor%}
  </tr>

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

Load only columns selected from checkboxes

▼ Complete code

Backend code

```
@app.route('/recm_summary',methods=['GET','POST'])
def recm_summary():
    os.chdir('/home/Amos/UK_MQTT_Json_Rep/')
    contents = open('ukrecm_data.json', "r").read()
    data = [json.loads(str(item)) for item in contents.strip().split('\n')]
    if request.method=='POST':
        col_selected=request.form.getlist('data')
        return render_template('RECM_data.html',records = data[::-1],data=col_selected)

    elif request.method=='GET':
        # print(data[1]
        return render_template('RECM_data1.html',records = data[1])
        response = 'No data since last 5 minutes.Please check that devices are sending data or that script is active'
        return response
```

▼ RECM data_1.html : to display starting data without checkboxes selected

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
<title>Untitled Document</title>
<script src="https://cdn.jsdelivr.net/npm/bootstrap@5.1.1/dist/js/bootstrap.bundle.min.js" integrity="sha384-/bQdsTh/da6pkI1MST/rWk
<link href="https://cdn.jsdelivr.net/npm/bootstrap@5.1.1/dist/css/bootstrap.min.css" rel="stylesheet" integrity="sha384-F3w7mX95Pdg
<style>

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.table th {
  padding-top: 12px;
  padding-bottom: 12px;
  text-align: center;
  background-color: #0069ab;
  color: white;
}

</style>

</head>

<body>
  <u>Radio buttond: </u>
    <form method=post enctype=multipart/form-data  action="{{ url_for('recm_summary')}}">
        <div class="form-check">
         {%for i in records%}
         <input class="form-check-input" type="radio" name="data" id="data" value={{i}}>
         <label class="form-check-label" for="flexRadioDefault1">
           {{i}}
         </label><br>
        </div>
         {%endfor%}<br>
             <input class="btn btn-primary" name="submit" type="submit" value="Submit">
    </form>

</body>
</html>
```

▼ RECM_data.html : After check boxes have been selected

```
check box:
    <form method=post enctype=multipart/form-data  action="{{ url_for('recm_summary')}}">
        {%for i in records[1]%}
        <div class="form-check form-check-inline">
            <input class="form-check-input" type="checkbox" id="data" name="data" value={{i}}>
            <label class="form-check-label" for="data">{{i}}</label>
```

```
            </div>
            {%endfor%}<br>
                  <input class="btn btn-primary" name="submit" type="submit" value="Submit">
      </form>

<table class="table">
  <thead>
    {% for i in data %}
    <th align="center" valign="middle">{{i}}</th>
    {%endfor%}
    </thead>
    <tr>
     {%for i in records%}
     {%for j in data%}
     <td align="center" valign="middle">{{i[j]}}</td>
     {%endfor%}
  </tr>

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