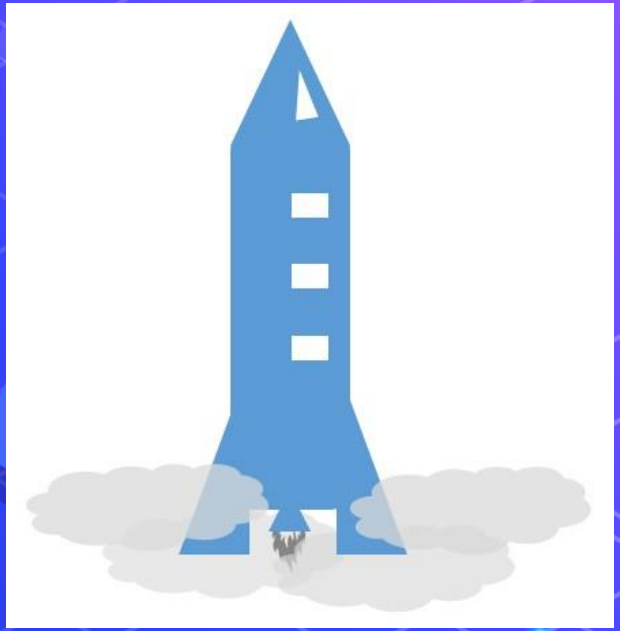
Software Engineering & Deployment with Flask

What is Deployment

The last step of a data science pipeline is model deployment, that means integrating the trained model within an application (web, mobile, desktop, hardware, game, etc...)

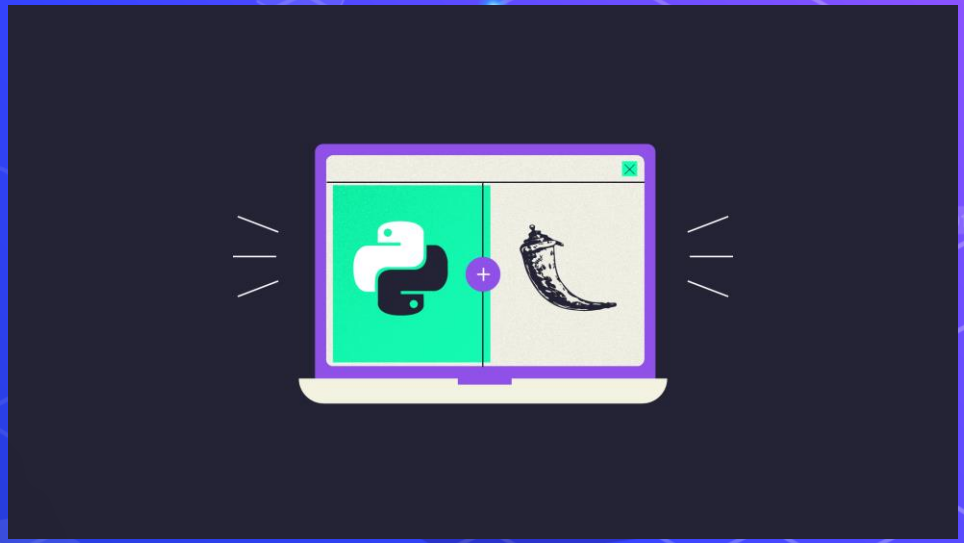
Business owners doesn't understand jupyter notebook
Or coding stuff so they should interact with the model
In an easy known way.



What is Deployment

we will learn to create
web applications and
web services using Flask.

Awesome >_



```
1 pip install flask gunicorn
```

Agenda

- Save and Load machine learning models
- What is Network Topologies
- What is Internet and Web Servers
- HTTP Request/Response Cycle
- Web applications with HTML and CSS
- Web services with JSON
- Flask Framework
- Deploy on Heroku cloud

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- **Save and Load machine learning models**
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Save and Load machine learning models

```python
from sklearn.linear_model import LogisticRegression
import joblib


model = LogisticRegression()
model.fit(X_train, Y_train)


# save the model to disk
joblib.dump(model, 'model.pkl')


# some time later...
# load the model from disk
loaded_model = joblib.load('model.pkl')
loaded_model.predict(X_test)
```

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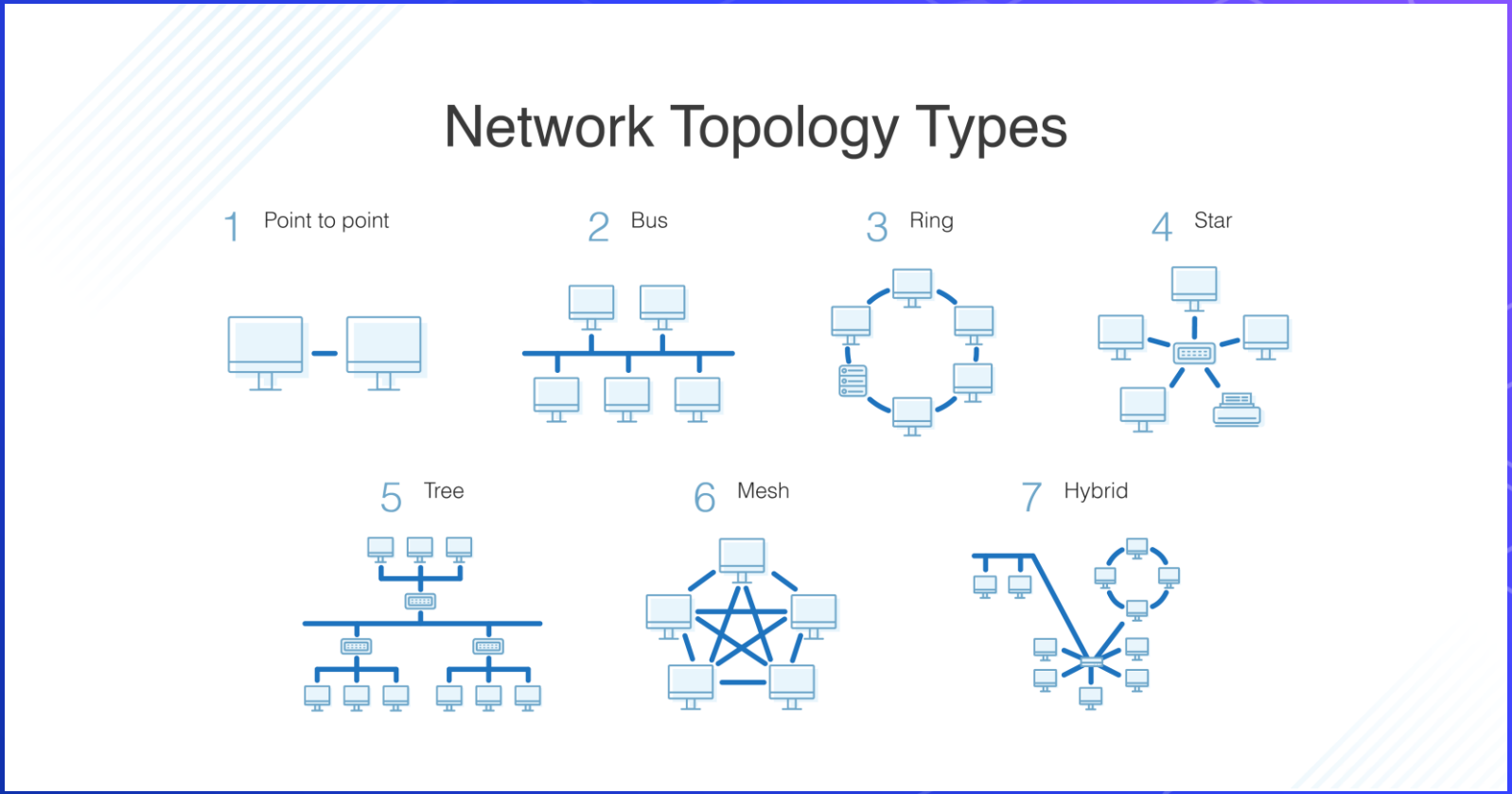
What is Network Topologies



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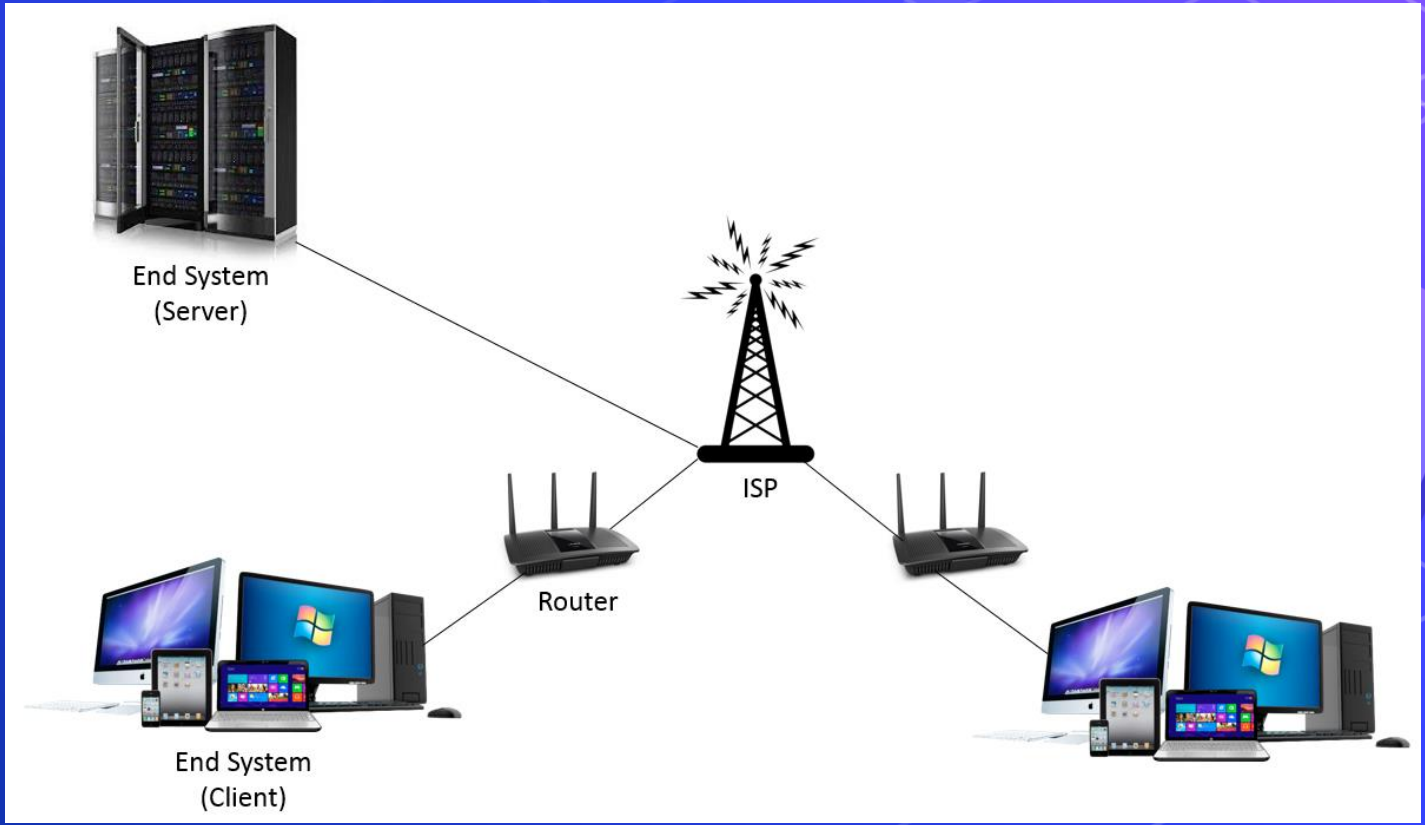
What is Internet and Web Servers



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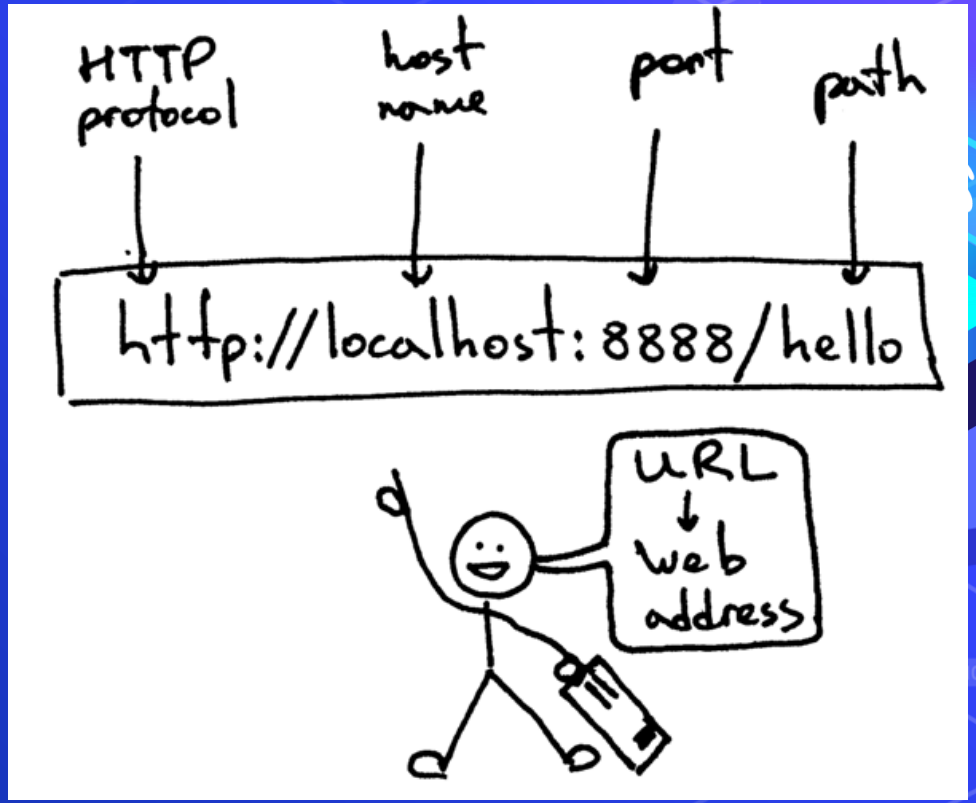
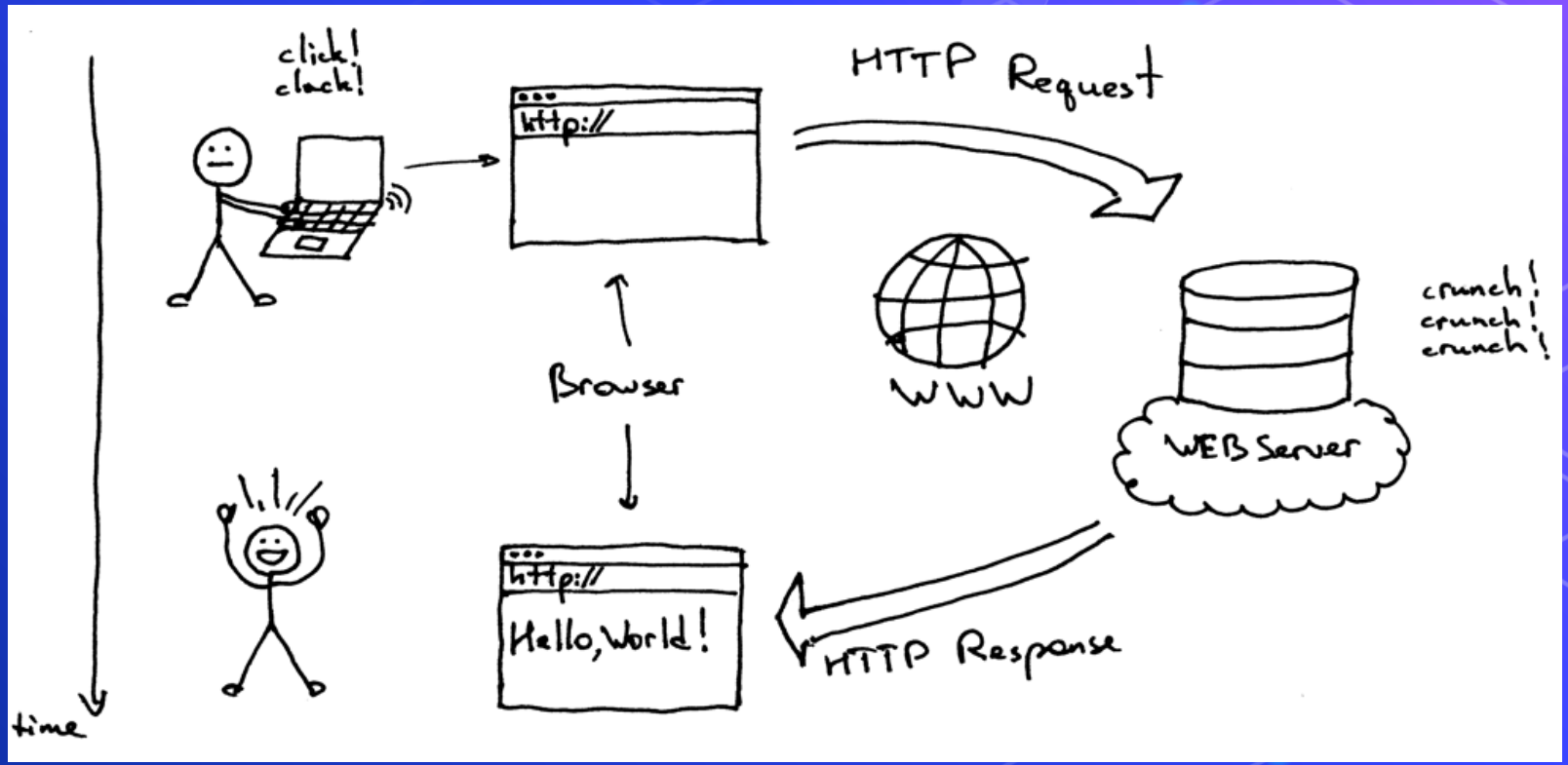
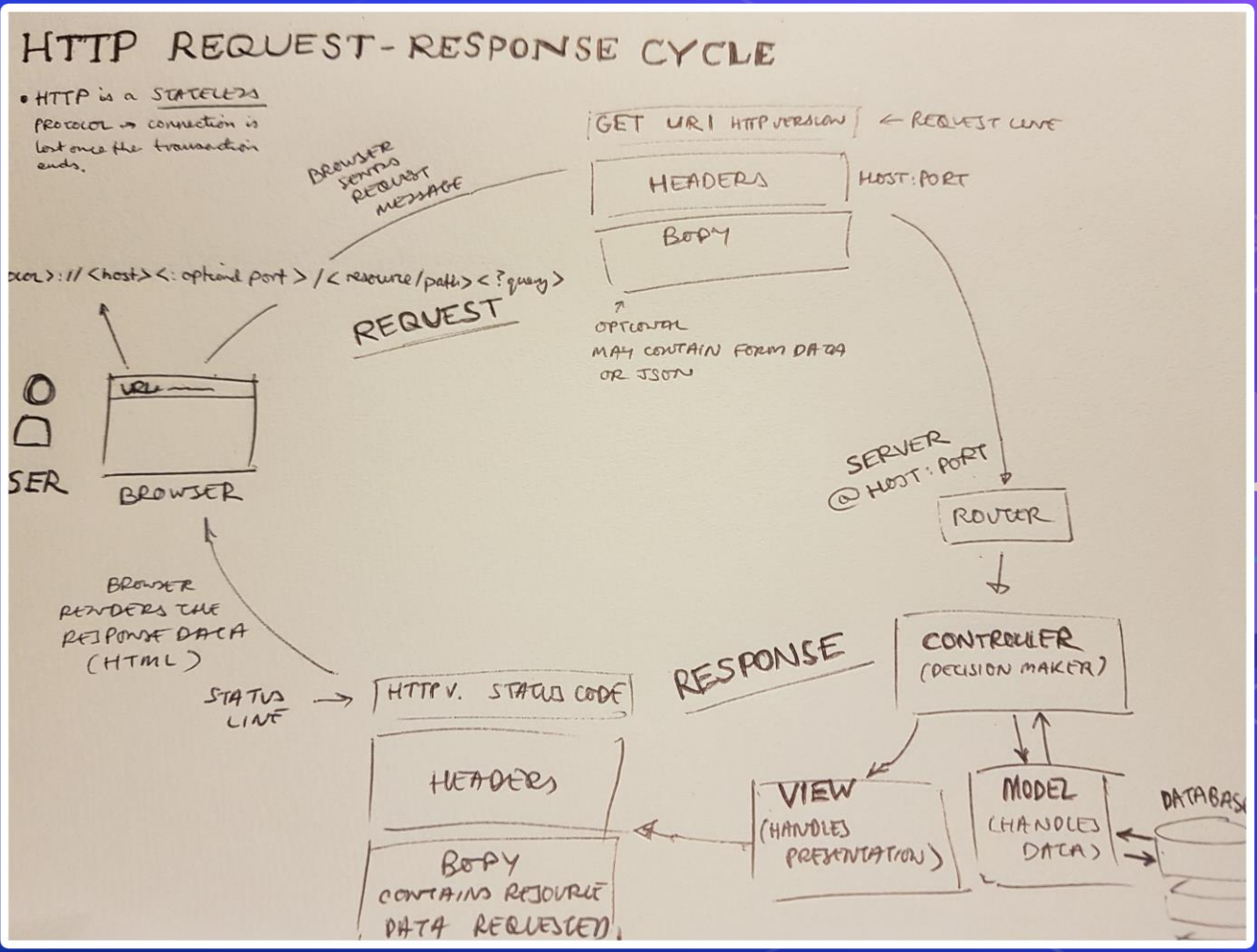
HTTP Request/Response Cycle



HTTP Request/Response Cycle



HTTP REQUEST-RESPONSE CYCLE



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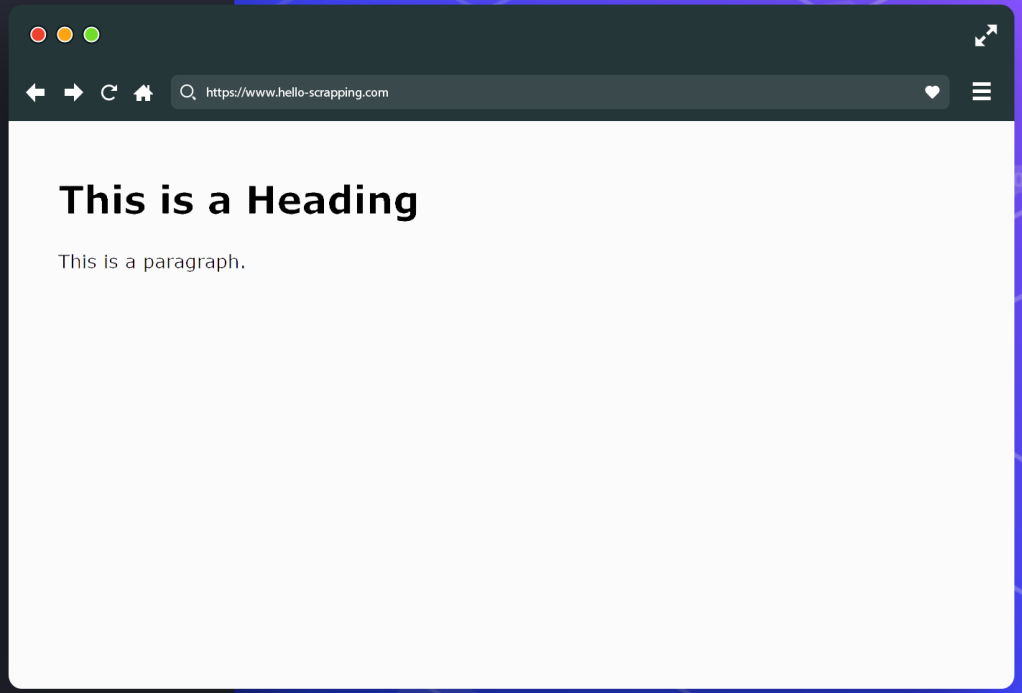
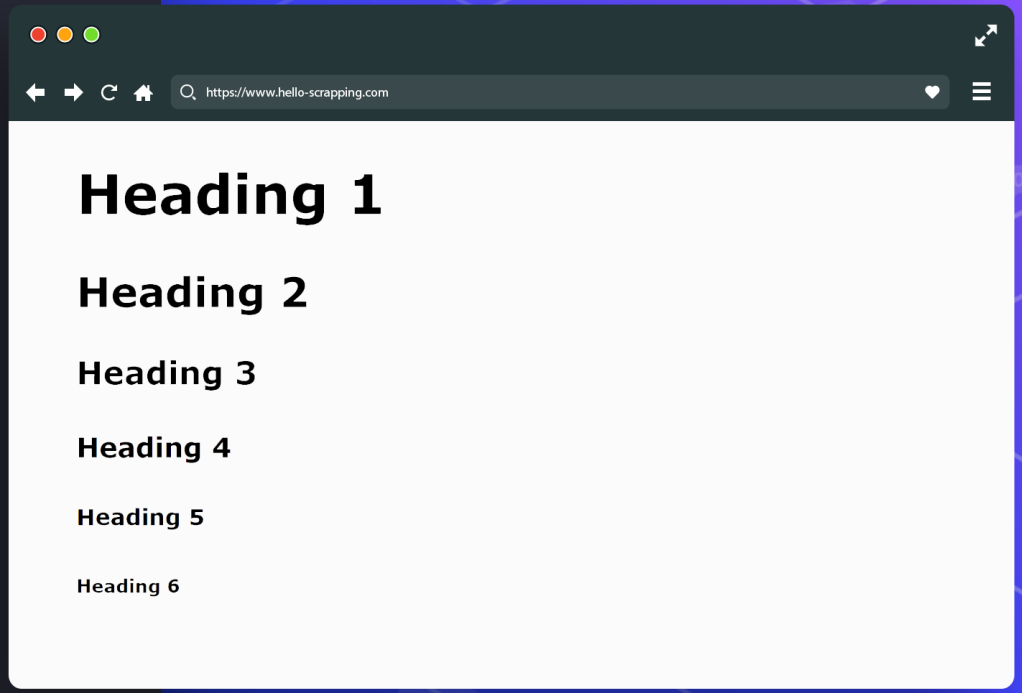
HTML (base snippet code)

```html
<!DOCTYPE html>
<html>

  <head>
    <title>Page Title</title>
  </head>


  <body>

    <h1>This is a Heading</h1>
    <p>This is a paragraph.</p>

  </body>
</html>

```



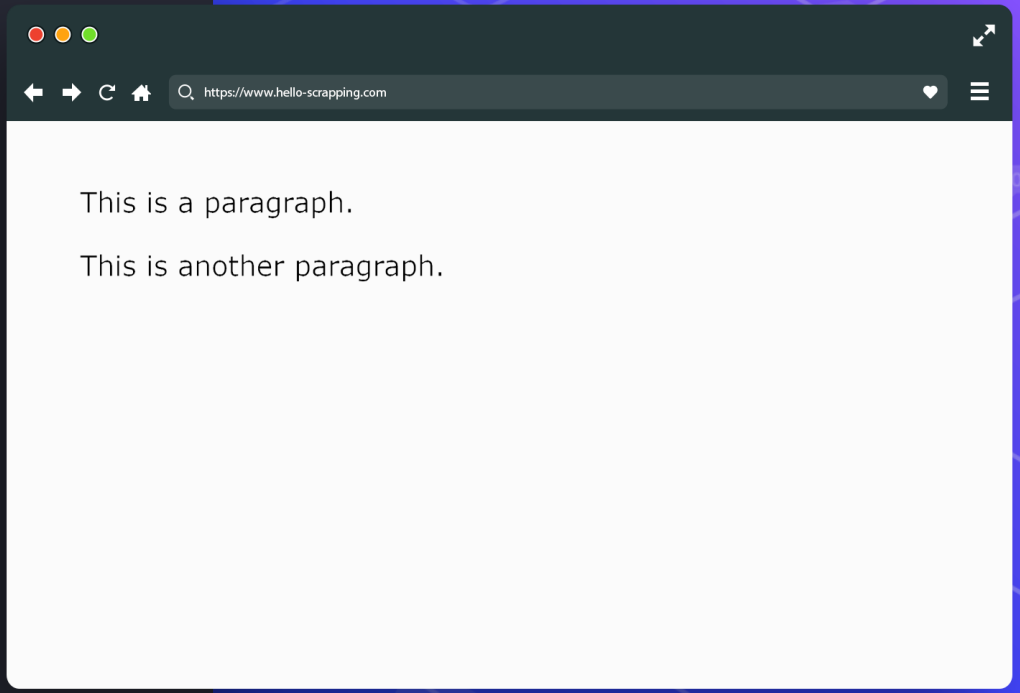
HTML (header)

```html
<!DOCTYPE html>
<html>

  <head>
    <title>Page Title</title>
  </head>


  <body>

    <h1>Heading 1</h1>
    <h2>Heading 2</h2>
    <h3>Heading 3</h3>
    <h4>Heading 4</h4>
    <h5>Heading 5</h5>
    <h6>Heading 6</h6>

  </body>
</html>

```



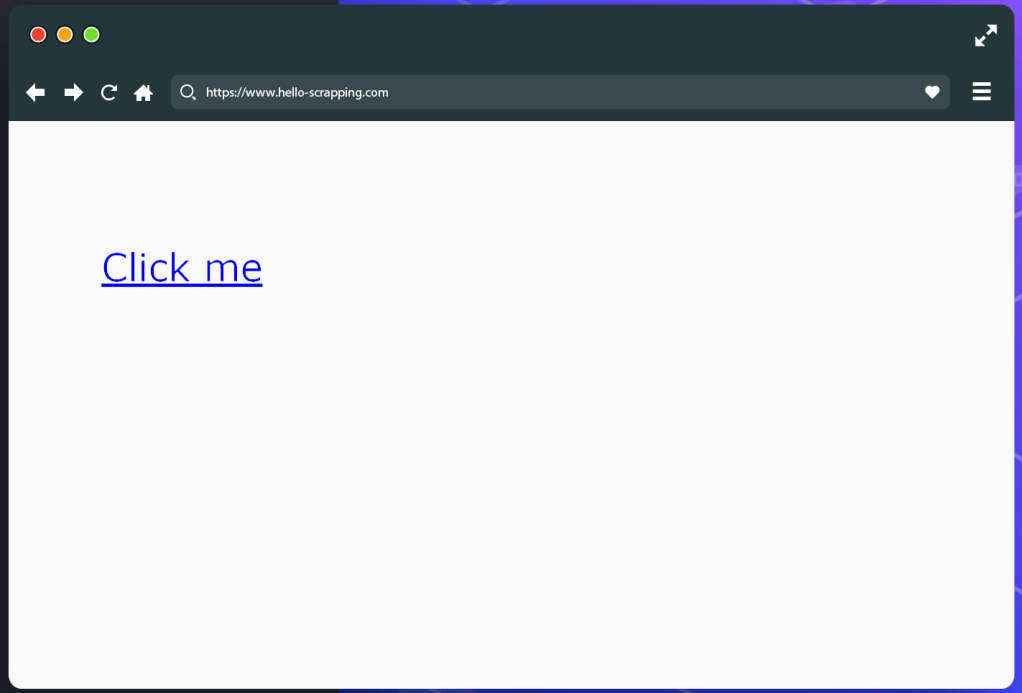
HTML (paragraph)

```html
<!DOCTYPE html>
<html>

  <head>
    <title>Page Title</title>
  </head>


  <body>

    <p>This is a paragraph.</p>
    <p>This is another paragraph.</p>

  </body>
</html>

```



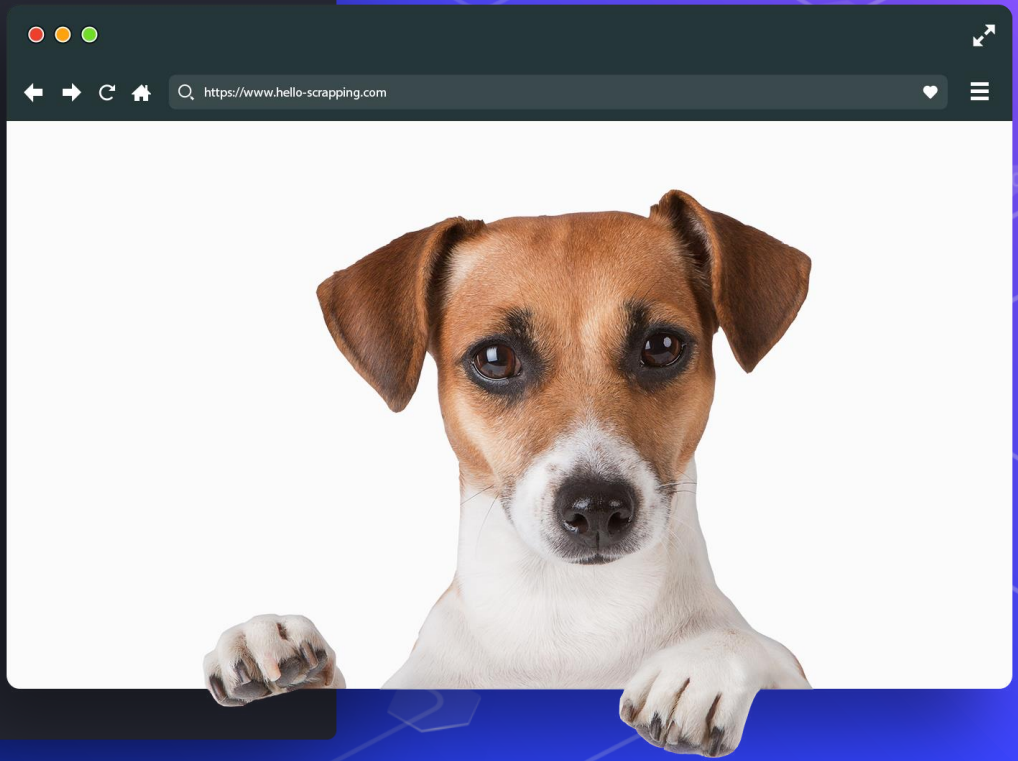
HTML (link)

```html
<!DOCTYPE html>
<html>

  <head>
    <title>Page Title</title>
  </head>


  <body>

    <a href="url">Click me</a>

  </body>
</html>

```



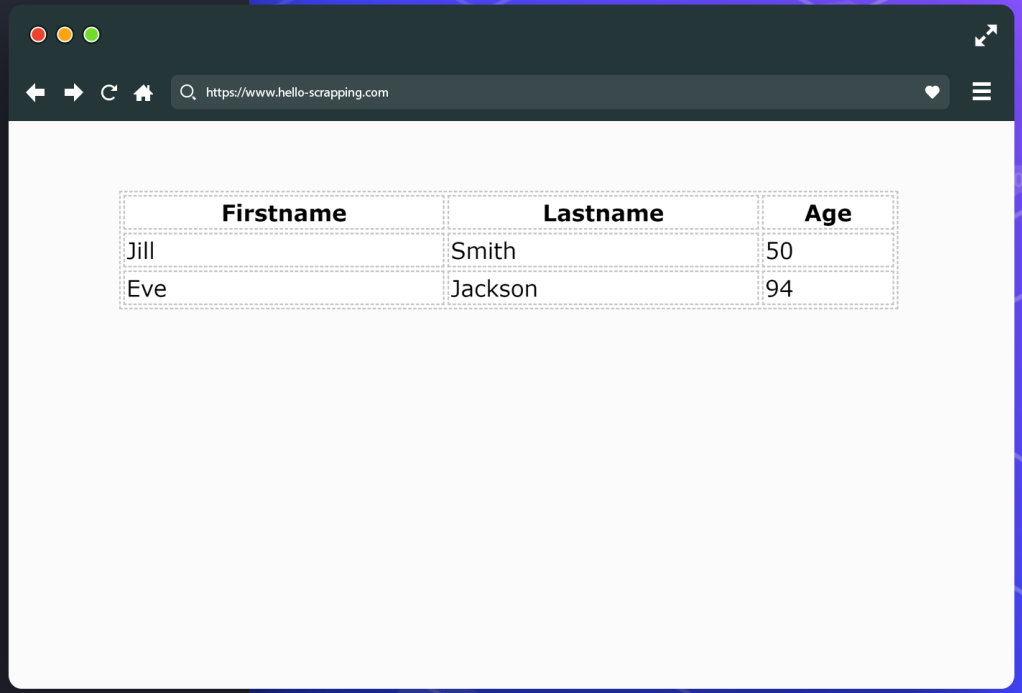
HTML (image)

```html
<!DOCTYPE html>
<html>

  <head>
    <title>Page Title</title>
  </head>


  <body>

    <img src="dog.jpg">

  </body>
</html>

```



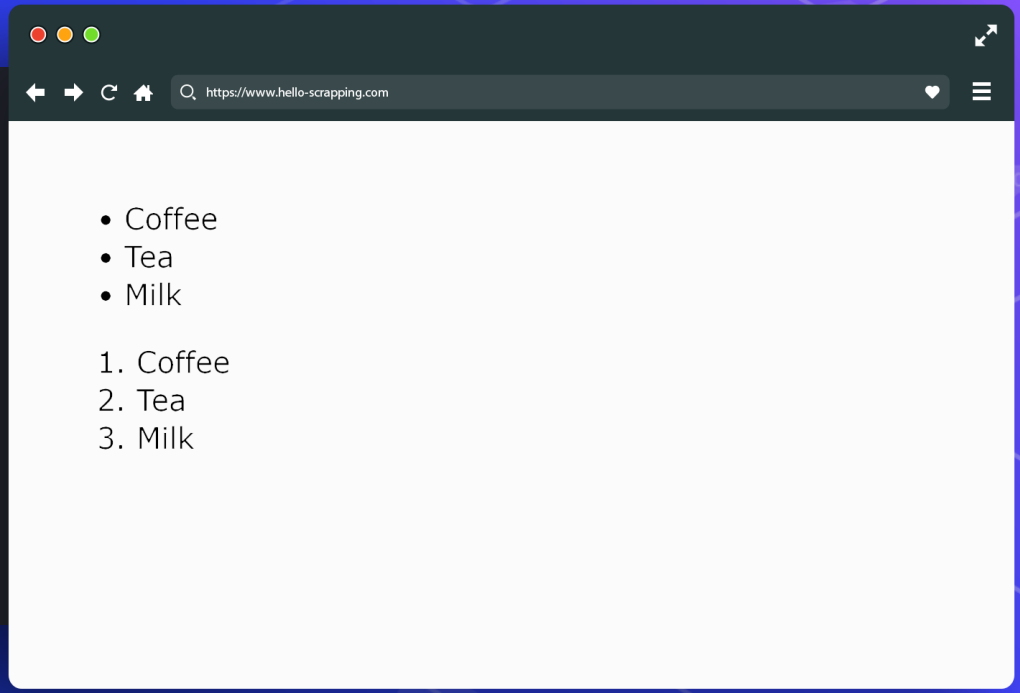
HTML (table)

```html
<table style="width:100%">
    <tr>
        <th>Firstname</th>
        <th>Lastname</th>
        <th>Age</th>
    </tr>
    <tr>
        <td>Jill</td>
        <td>Smith</td>
        <td>50</td>
    </tr>
    <tr>
        <td>Eve</td>
        <td>Jackson</td>
        <td>94</td>
    </tr>
</table>

```



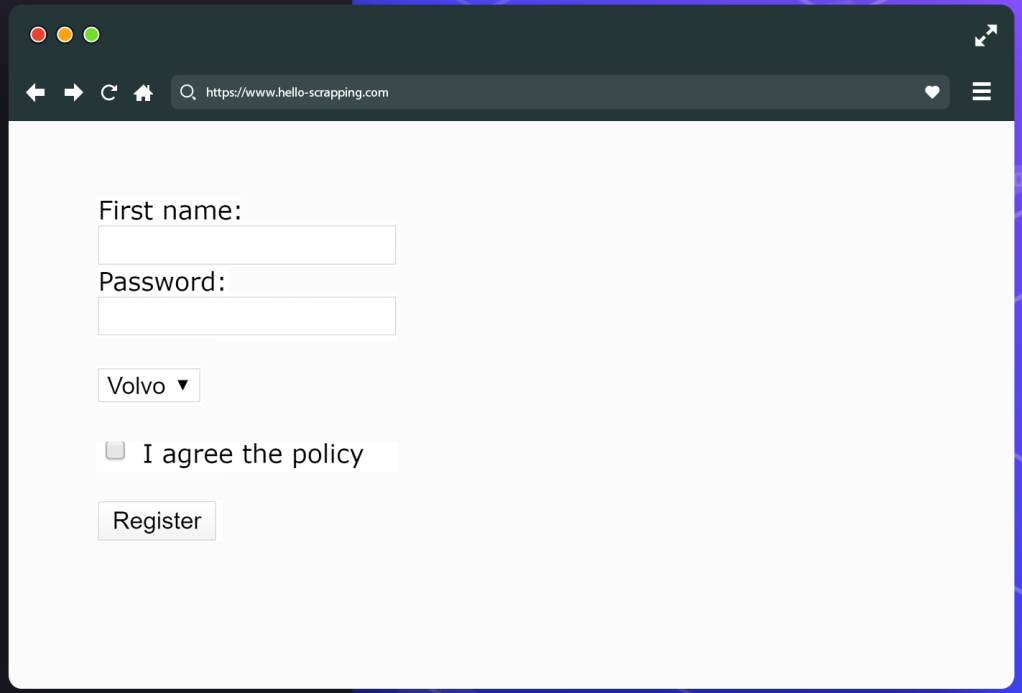
HTML (list)

```html
<ul>
    <li>Coffee</li>
    <li>Tea</li>
    <li>Milk</li>
</ul>

<ol>
    <li>Coffee</li>
    <li>Tea</li>
    <li>Milk</li>
</ol>
```



HTML (form)

```html
<form>

    First name: <input type="text">

    Passowrd: <input type="password">

    <select>
        <option>Volvo</option>
        <option>Saab</option>
        <option>Fiat</option>
        <option>Audi</option>
    </select>


    <input type="checkbox">
    I agree the policy

    <input type="submit" value="Register">

</form>
```

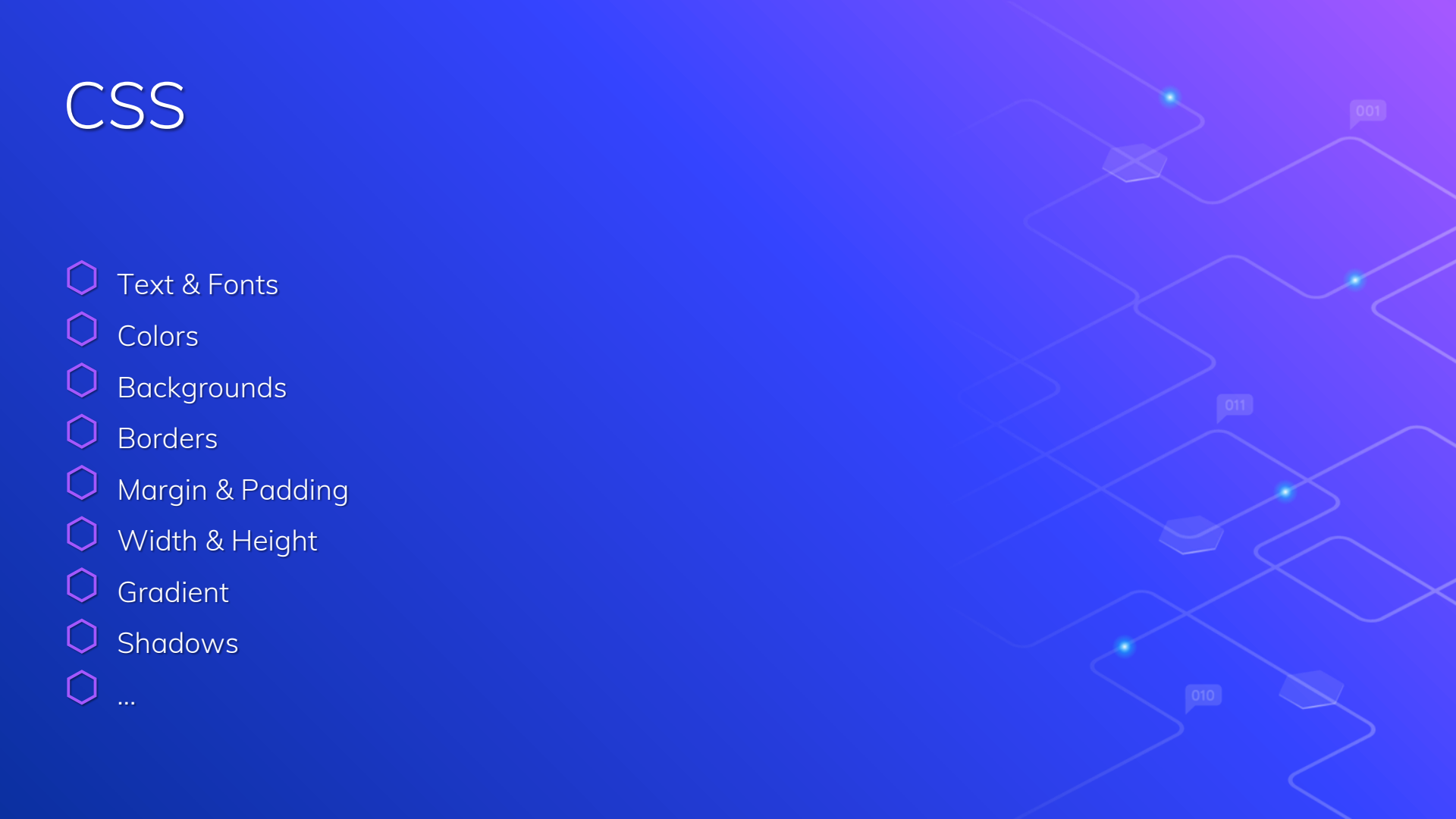


Other HTML Elements

- Div
- Span
- Video
- Audio
- Iframe
- Header
- Footer
- Canvas
- ...

CSS

- Text & Fonts
- Colors
- Backgrounds
- Borders
- Margin & Padding
- Width & Height
- Gradient
- Shadows
- ...



Check Also

- JavaScript
- React & Angular
- Ajax
- Web Sockets
- ...

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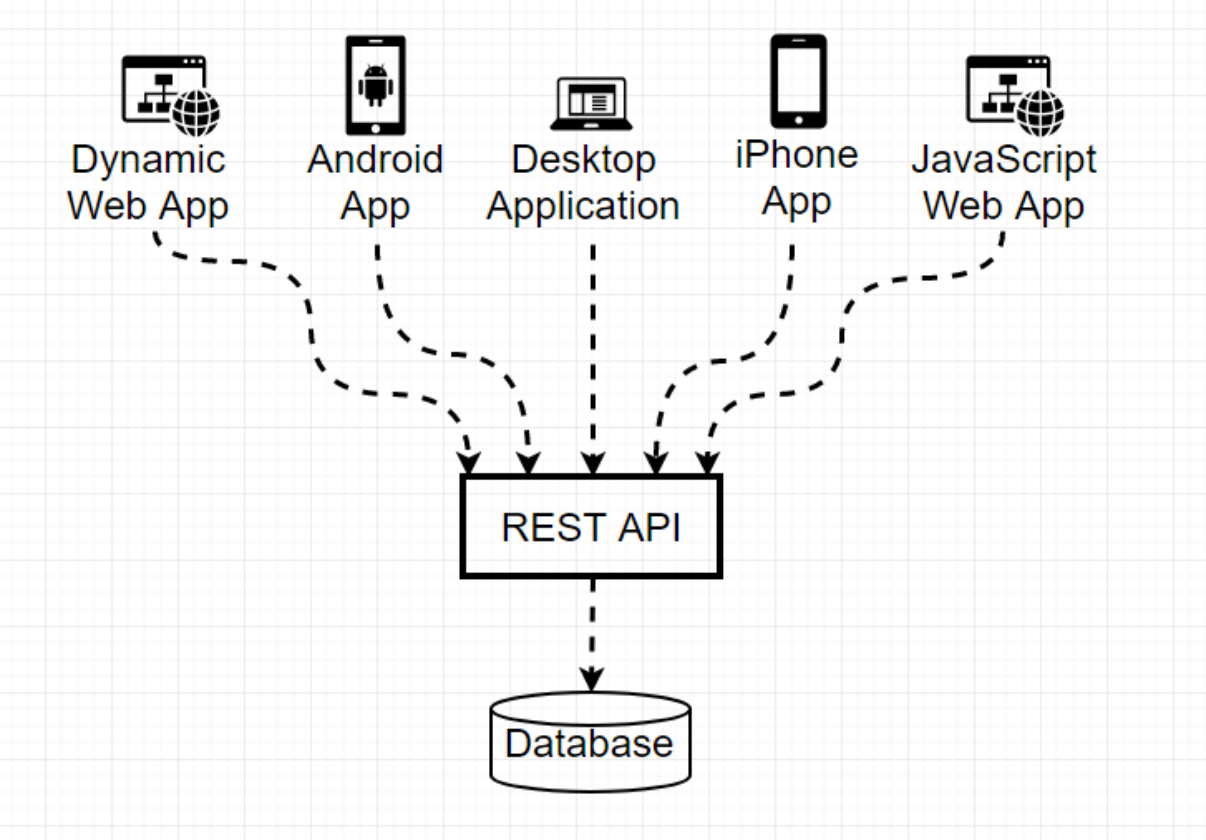
REST API Web Services



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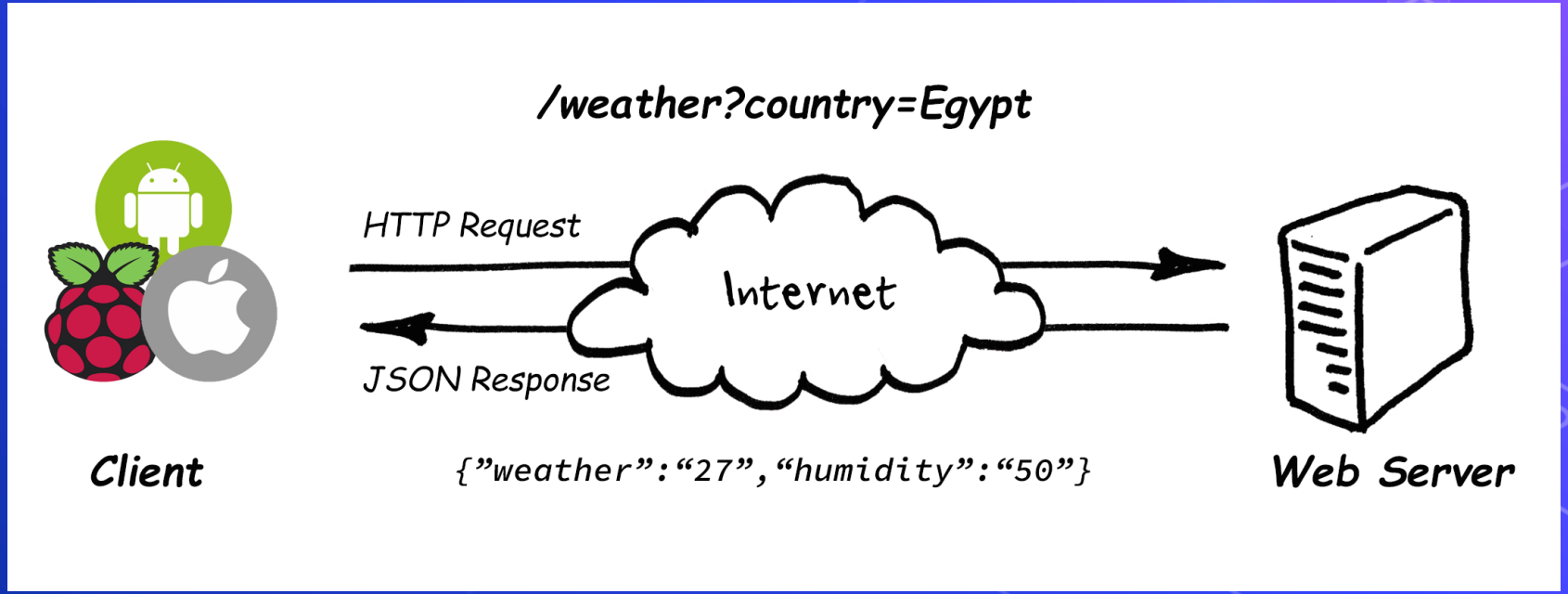

REST API Web Services

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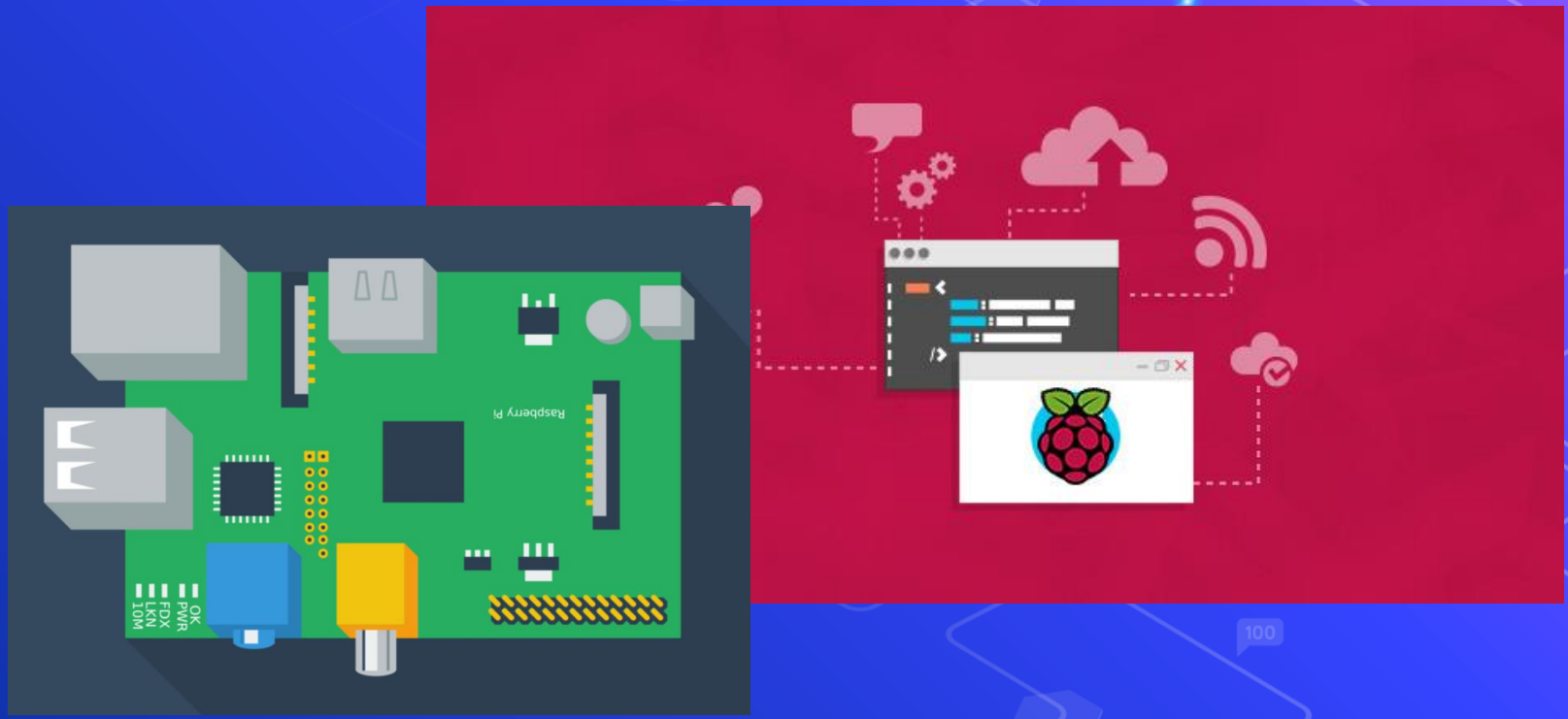

Work with JSON

```json
{
    "employees":
    [
        {
          "id": "1",
          "employee_name": "Ahmed",
          "employee_salary": "320800",
          "employee_age": "61"
        },
        {
          "id": "2",
          "employee_name": "Amr",
          "employee_salary": "170750",
          "employee_age": "63"
        },
        {
          "id": "3",
          "employee_name": "Sara",
          "employee_salary": "86000",
          "employee_age": "66"
        }
    ]
}
```

Work with JSON

Install POSTMAN

https://www.postman.com/

Install JSON Viewer extension for chrome or firefox

https://chrome.google.com/webstore/detail/json-viewer/gbmdgpbipfallnflgajpaliibnhdgobh

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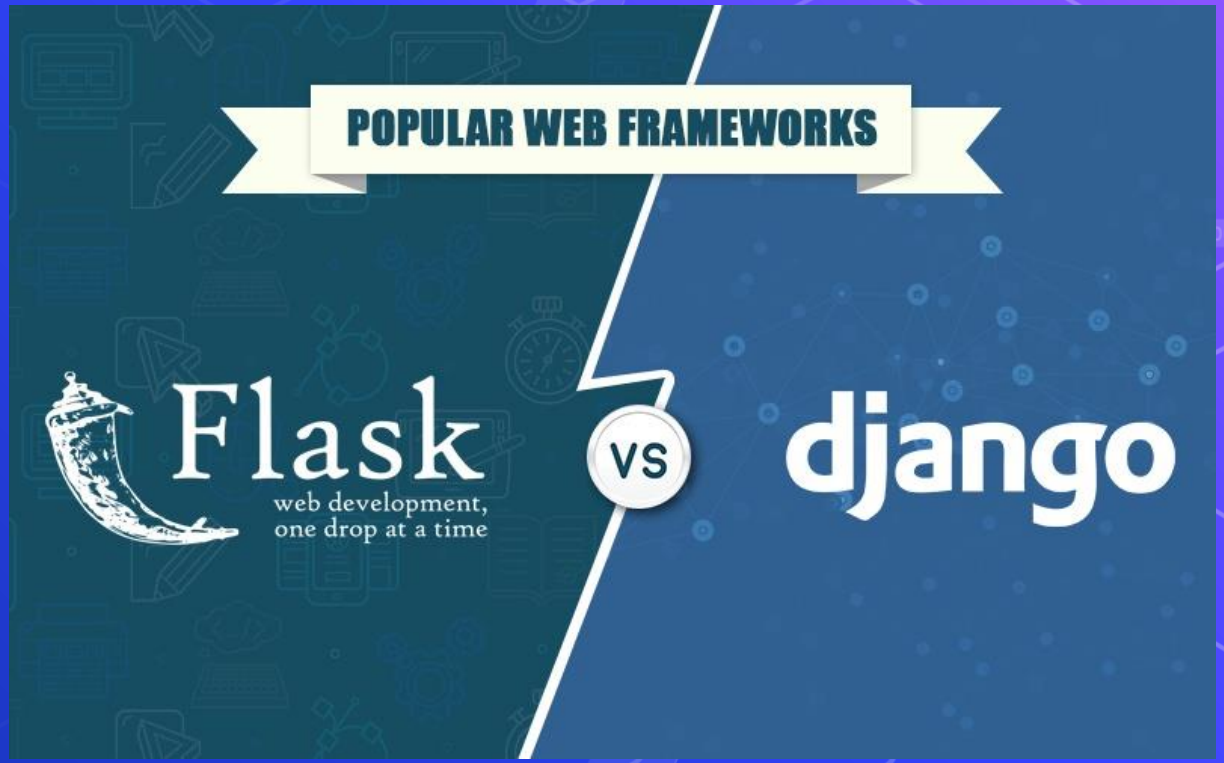
Flask Framework

Lets code >_



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Deploy on Heroku cloud

1- Create a new account.

2- Create a new app.

3- `pip freeze > requirements.txt`

4- Make Procfile.

5- Follow the deployment instructions.

That’s it easy stuff xD

Questions ?!

Thanks!

>_ Live long and prosper