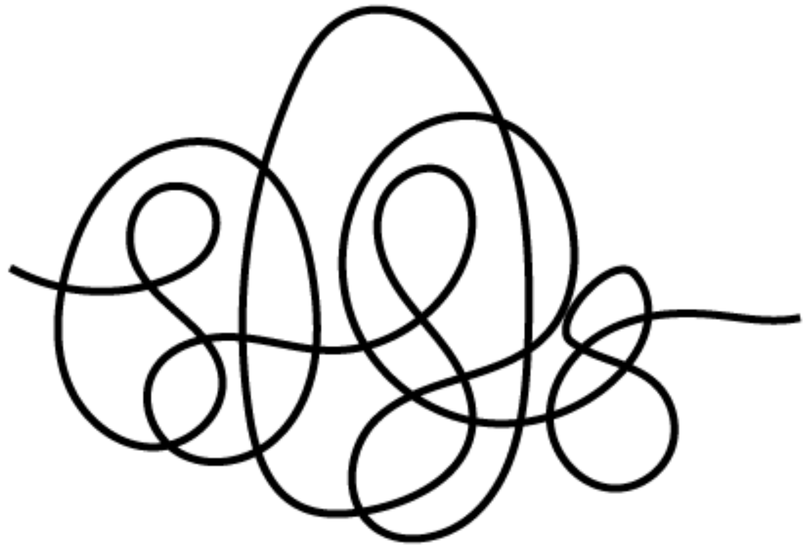
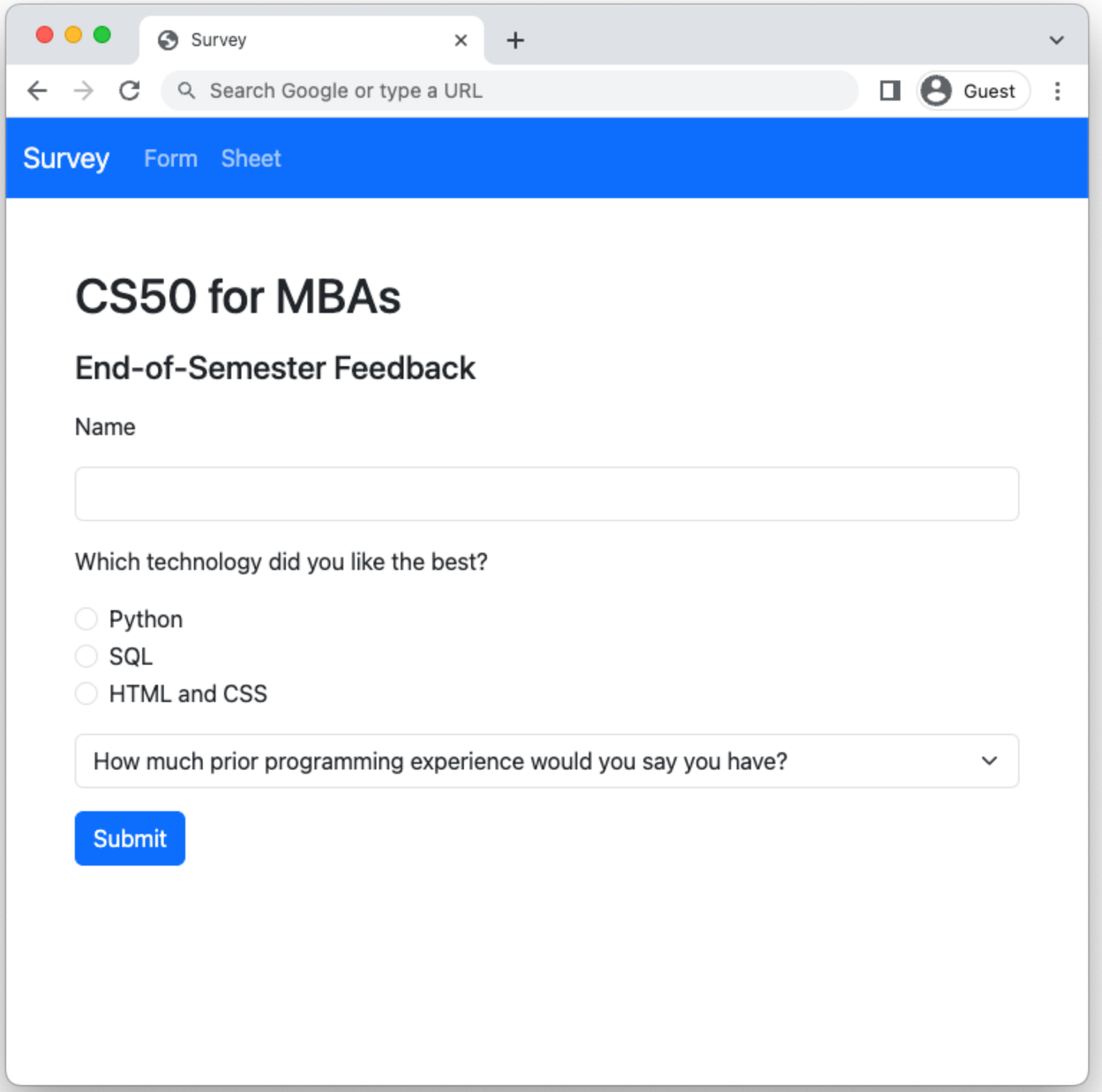
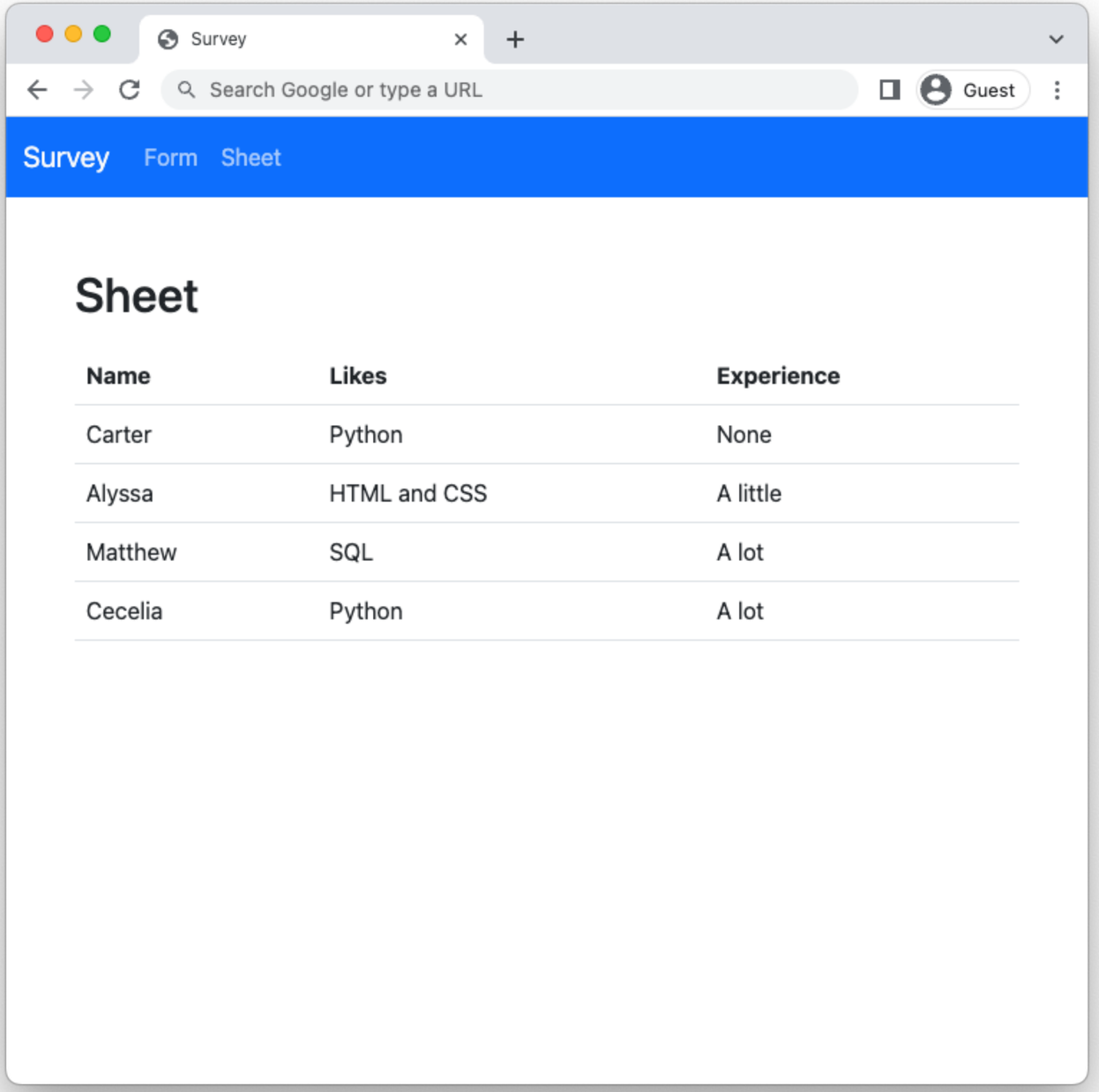


Lab 8

CS50 for MBAs

carterzenke.me/lab


Survey
Search Google or type a URL
Guest
Survey
Form
Sheet
CS50 for MBAs
End-of-Semester Feedback
Name
Which technology did you like the best?
Python
SQL
HTML and CSS
How much prior programming experience would you say you have?
Submit


Survey
Search Google or type a URL
Guest
Survey
Form
Sheet
Sheet
Name
Likes
Experience
Carter
Python
None
Alyssa
HTML and CSS
A little
Matthew
SQL
A lot
Cecelia
Python
A lot

```
wget https://cdn.cs50.net/hbs/2023/spring/labs/7/survey.zip
```

Flask

web development,
one drop at a time

Routes and Requests

https://survey.com/

protocol

https://survey.com/

domain

https://survey.com/

route

Routes

- Routes can define pages of your web application. For example,
  - `/`
  - `/about-us`
  - `/register`
  - `/submit`

/

/form

/sheet

http-server

```
flask run
```

Flask

- Flask can **listen for requests** to a certain route.
- Flask can **execute Python code** depending on the route requested.
- Flask can **render HTML files** depending on the route requested.

application.py

application.py

```
from flask import Flask

app = Flask(__name__)

@app.route("/")
def index():
    ...
```

application.py

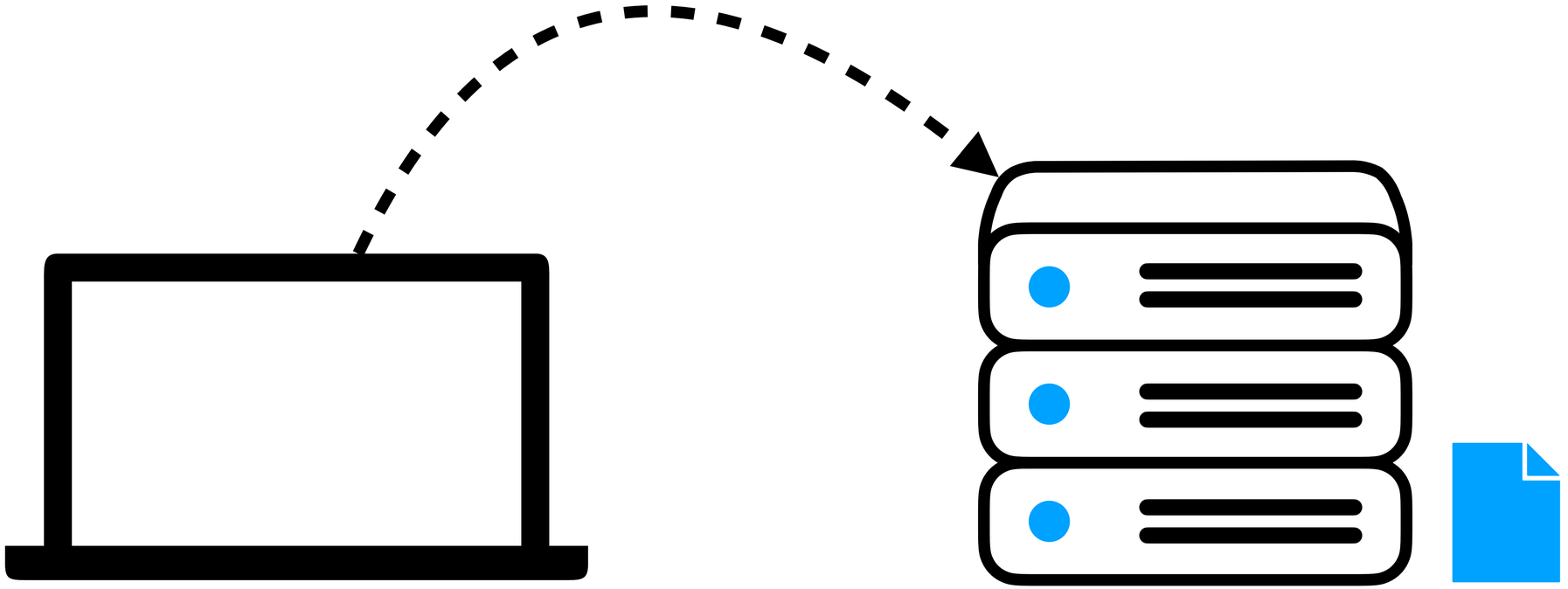
```
from flask import Flask

app = Flask(__name__)

@app.route("/")
def index():
    return "Hello, world!"
```

application.py

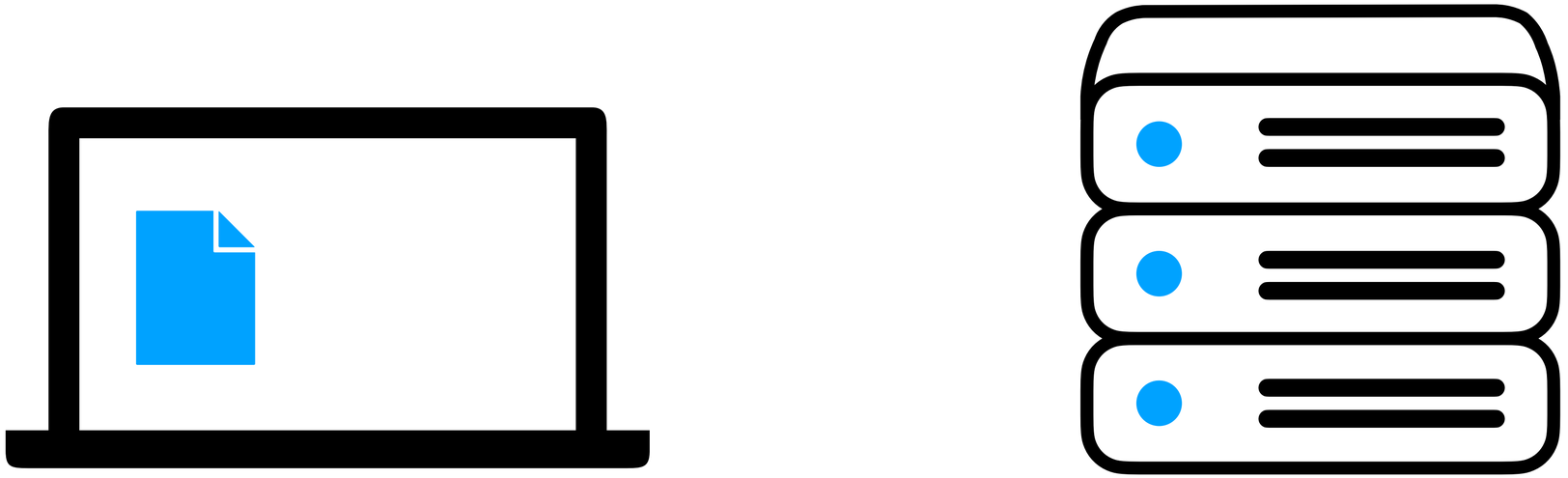
```
from flask import Flask, render_template

app = Flask(__name__)

@app.route("/")
def index():
    return render_template("index.html")
```

Request Methods

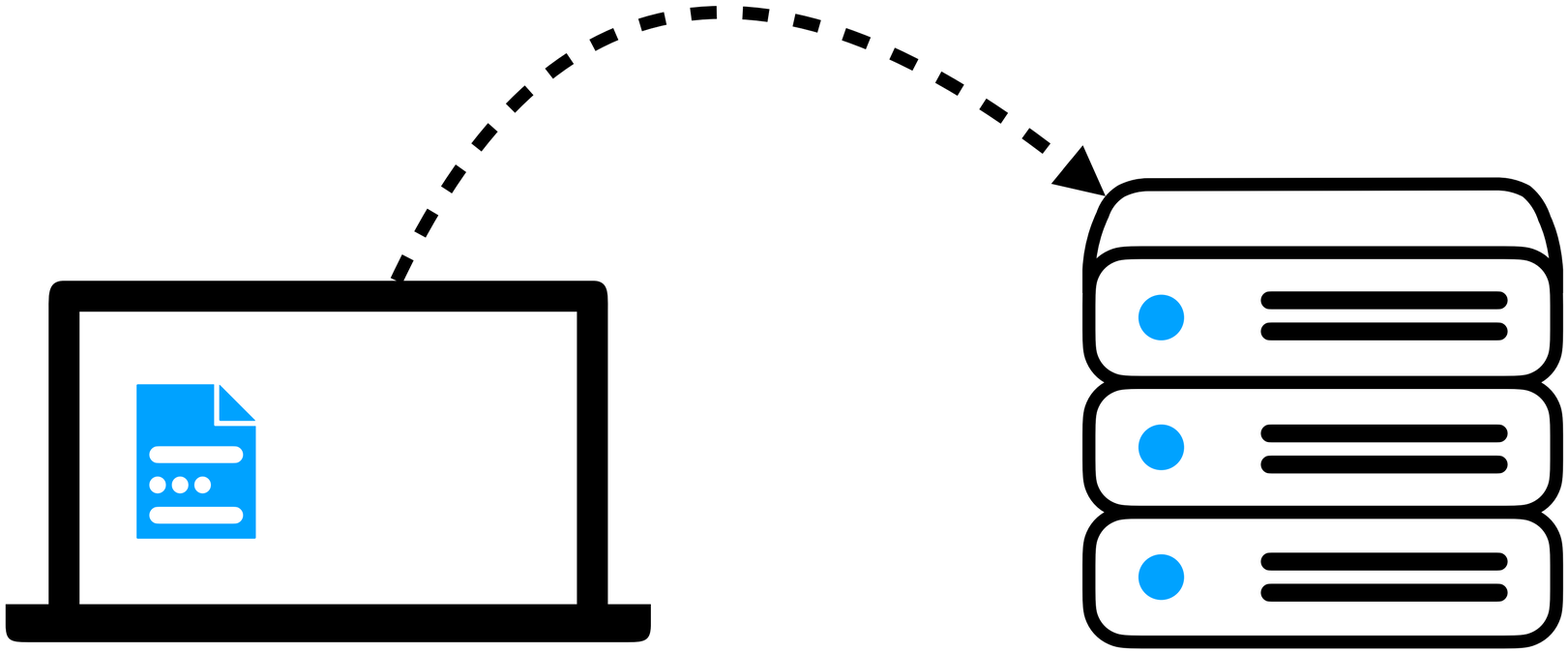
- Browsers can use different methods to request a route.



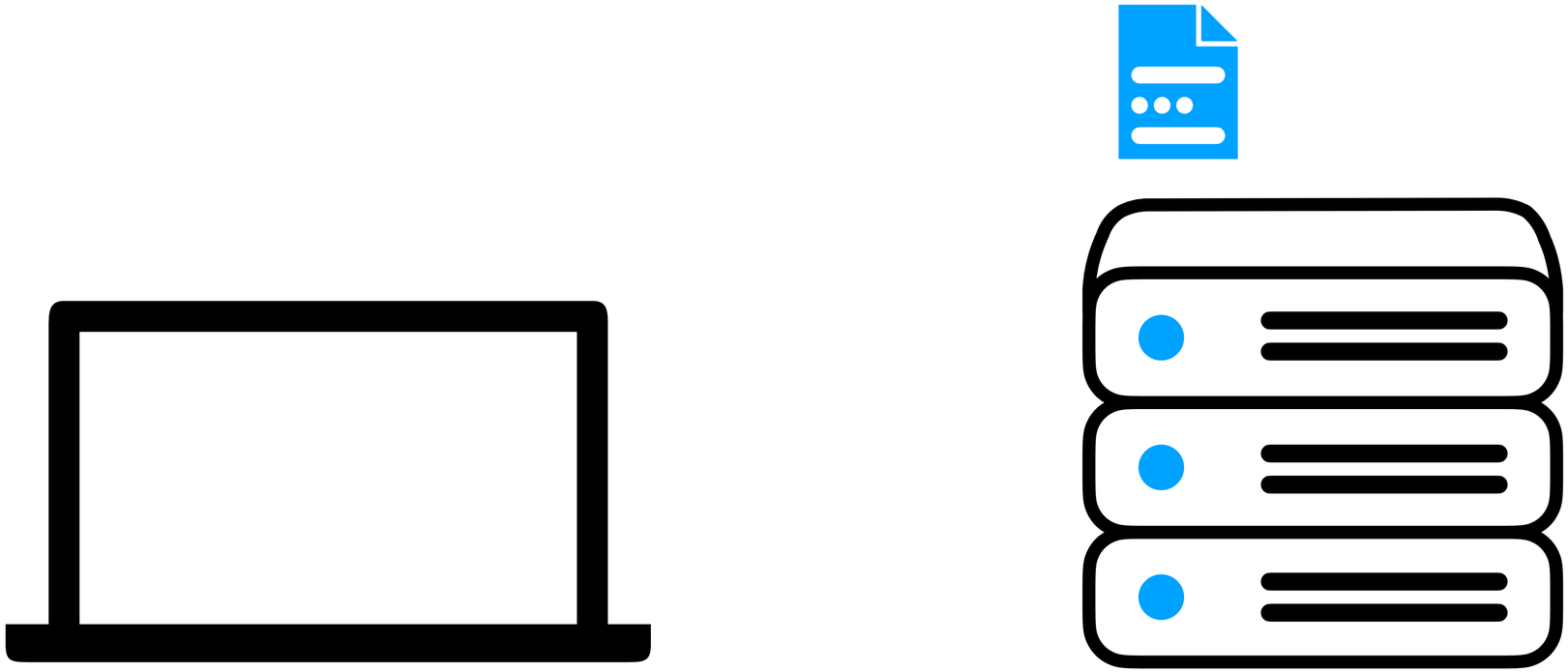
GET requests



GET requests



POST requests



POST requests

Templates

(And template inheritance)

index.html

```
<!DOCTYPE html>
<html lang="en">
    <head>
        <title>Survey</title>
    </head>
    <body>
        Please take our survey!
    </body>
</html>
```

form.html

```
<!DOCTYPE html>
<html lang="en">
    <head>
        <title>Survey</title>
    </head>
    <body>
        <form>
            <input type="text">
        </form>
    </body>
</html>
```

index.html

```
<!DOCTYPE html>
<html lang="en">
    <head>
        <title>Survey</title>
    </head>
    <body>
        Please take our survey!
    </body>
</html>
```

form.html

```
<!DOCTYPE html>
<html lang="en">
    <head>
        <title>Survey</title>
    </head>
    <body>
        <form>
            <input type="text">
        </form>
    </body>
</html>
```

layout.html

```
<!DOCTYPE html>
<html lang="en">
    <head>
        <title>Survey</title>
    </head>
    <body>
        {% block content %}
        {% endblock %}
    </body>
</html>
```

index.html

```
{% extends "layout.html" %}

{% block content %}
    Please take our survey!
{% endblock %}
```

layout.html

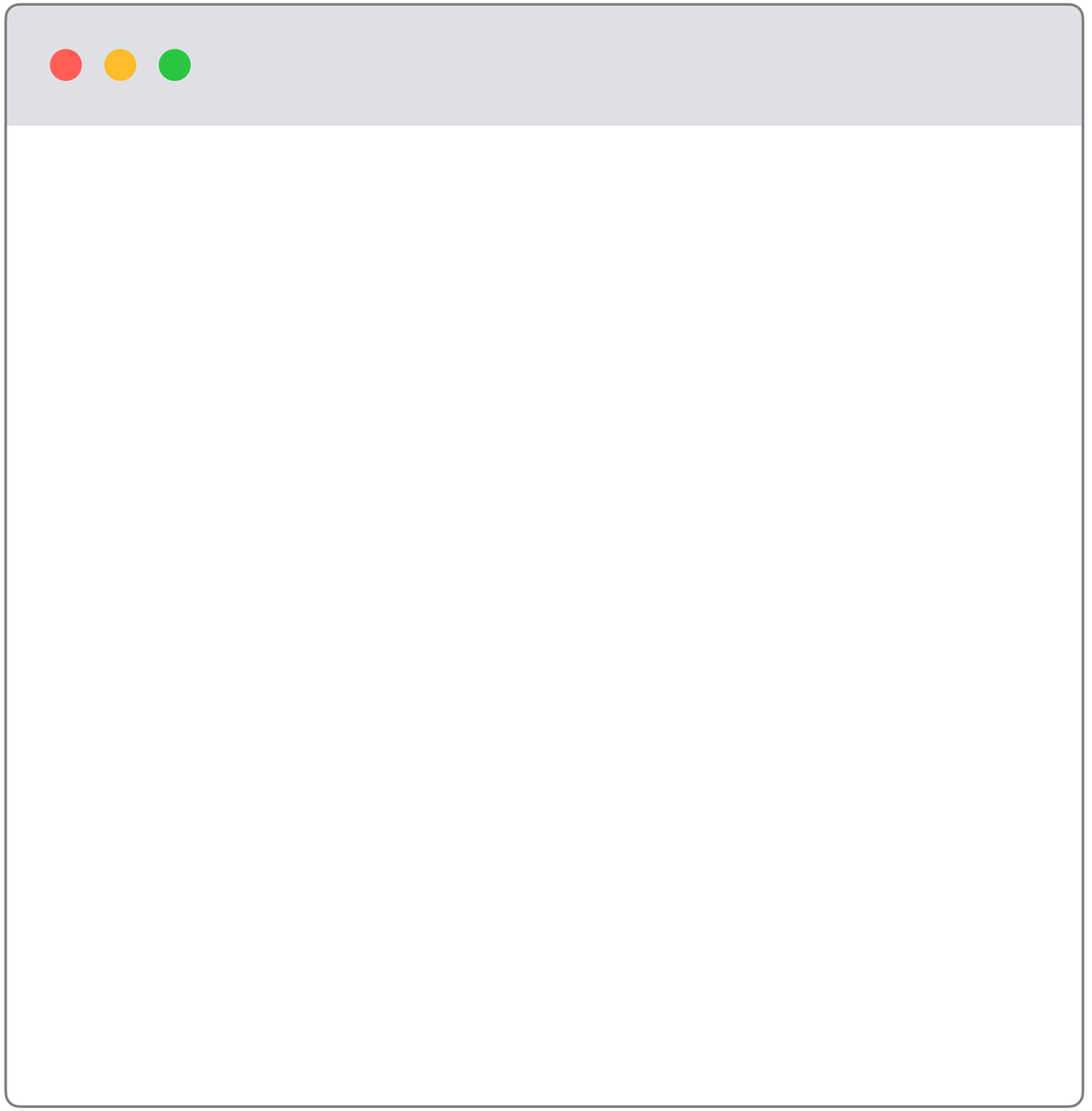
```
<!DOCTYPE html>
<html lang="en">
    <head>
        <title>Survey</title>
    </head>
    <body>
        {% block content %}
        {% endblock %}
    </body>
</html>
```

form.html

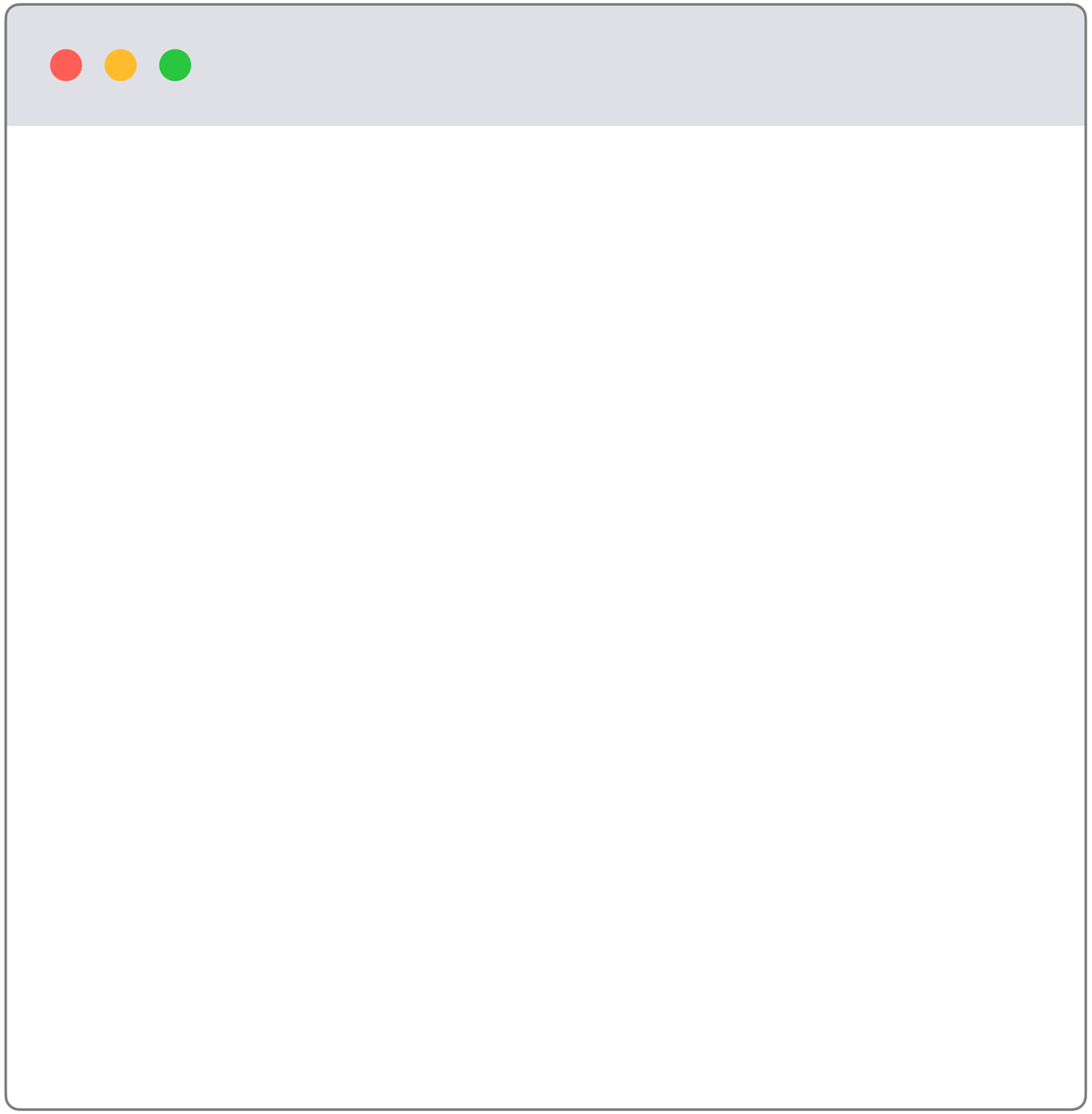
```
{% extends "layout.html" %}

{% block content %}
    <form>
        <input type="text">
    </form>
{% endblock %}
```

Forms

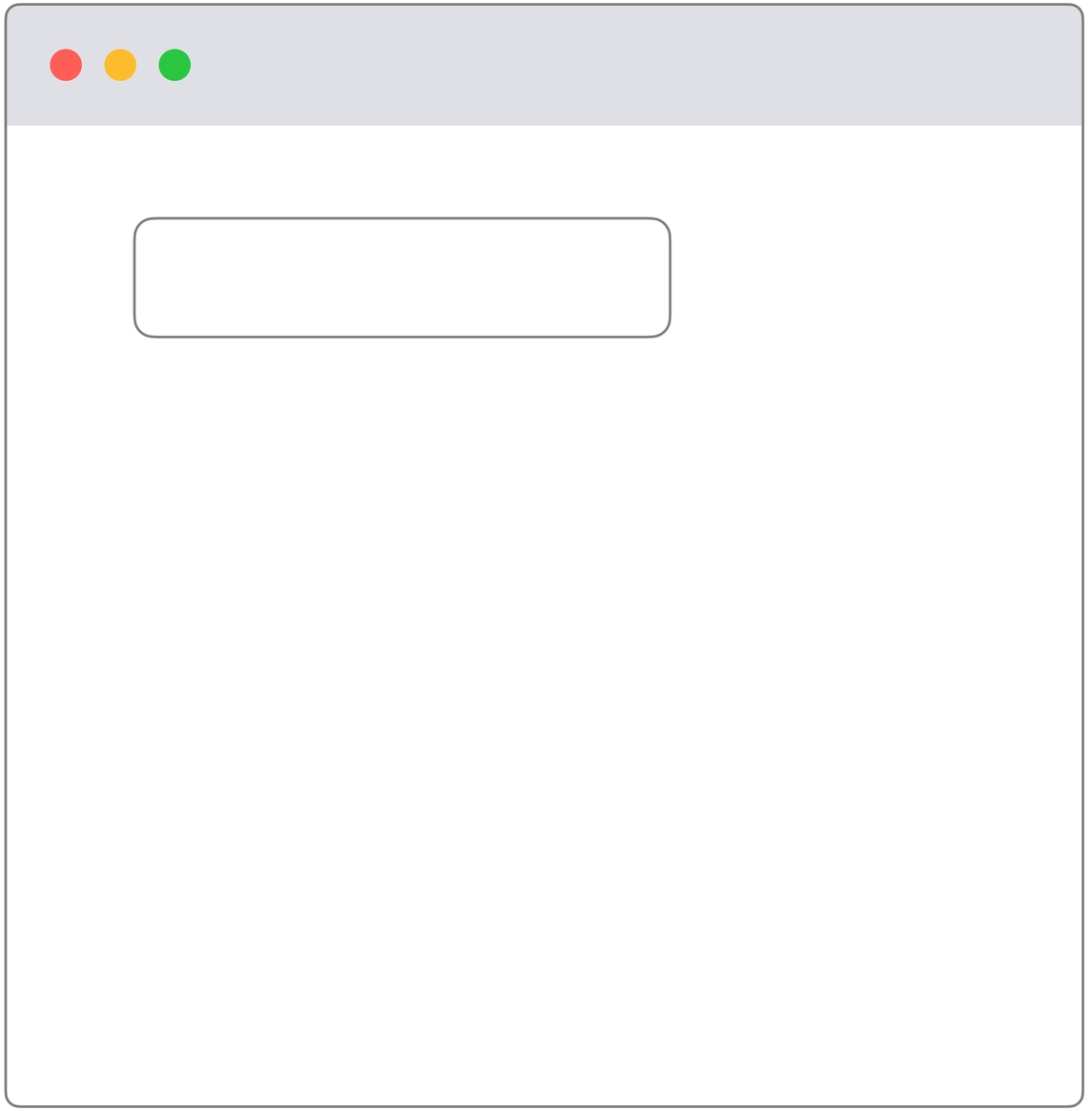
```
<form>
</form>
```



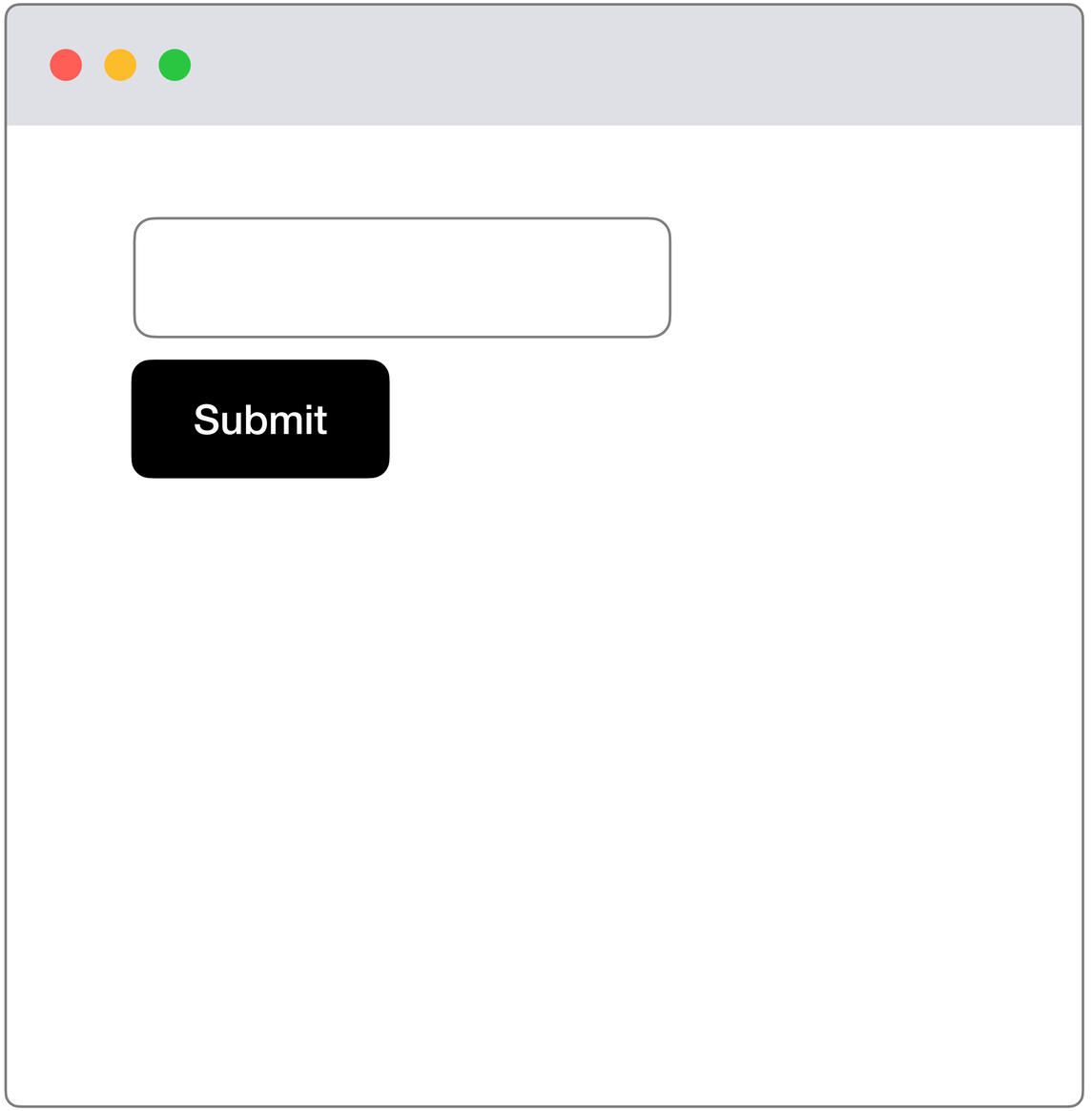
```
<form>
    <input type="text">
    <button type="submit>
        Submit
    </button>
</form>
```



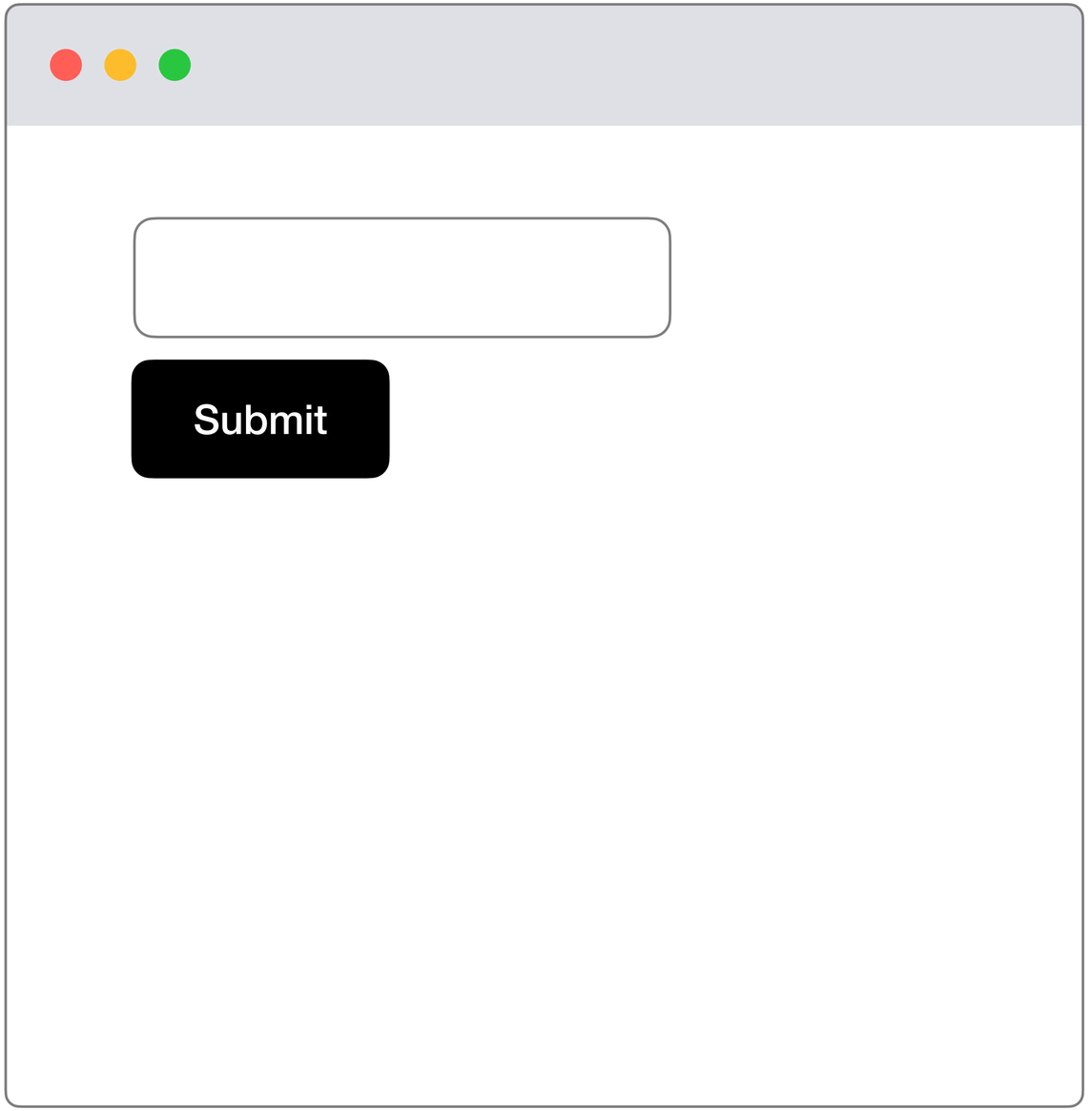
```
<form>
    <input type="text">
    <button type="submit>
        Submit
    </button>
</form>
```



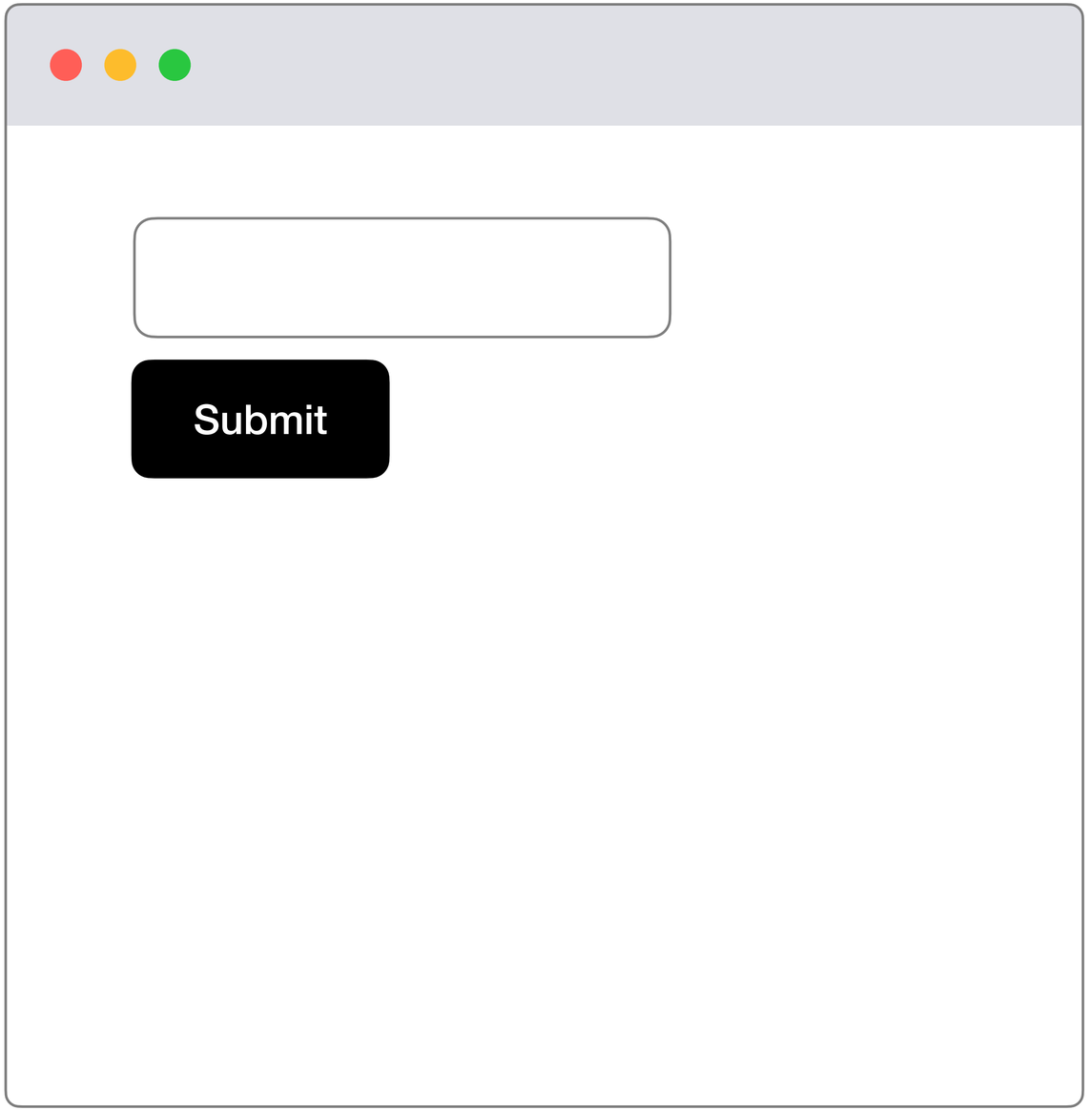
```
<form>
    <input type="text">
    <button type="submit>
        Submit
    </button>
</form>
```



```
<form>
    <input type="text">
    <button type="submit>
        Submit
    </button>
</form>
```



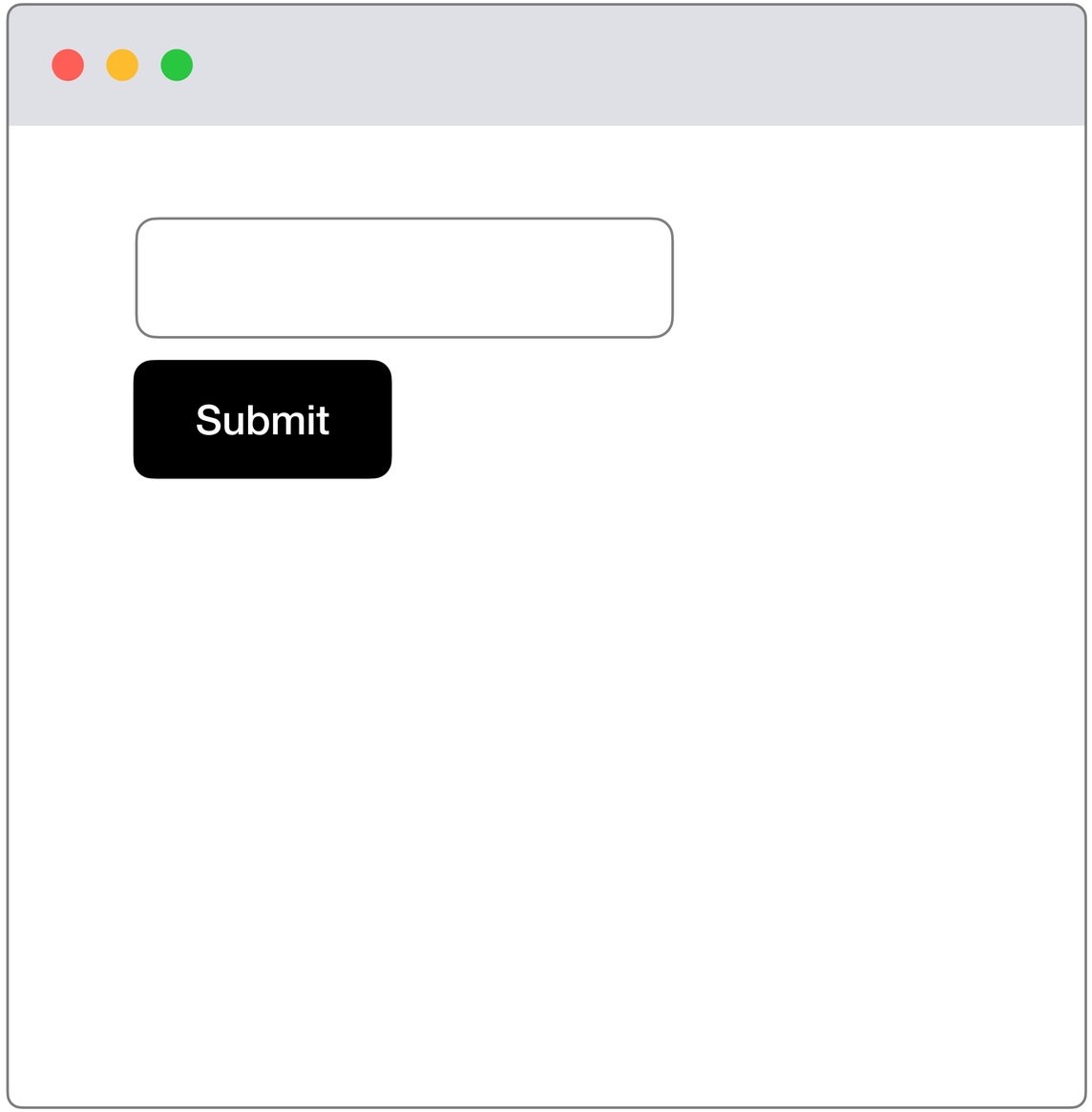
```
<form action="/" method="post">
    <input type="text">
    <button type="submit>
        Submit
    </button>
</form>
```



Route to request

↓

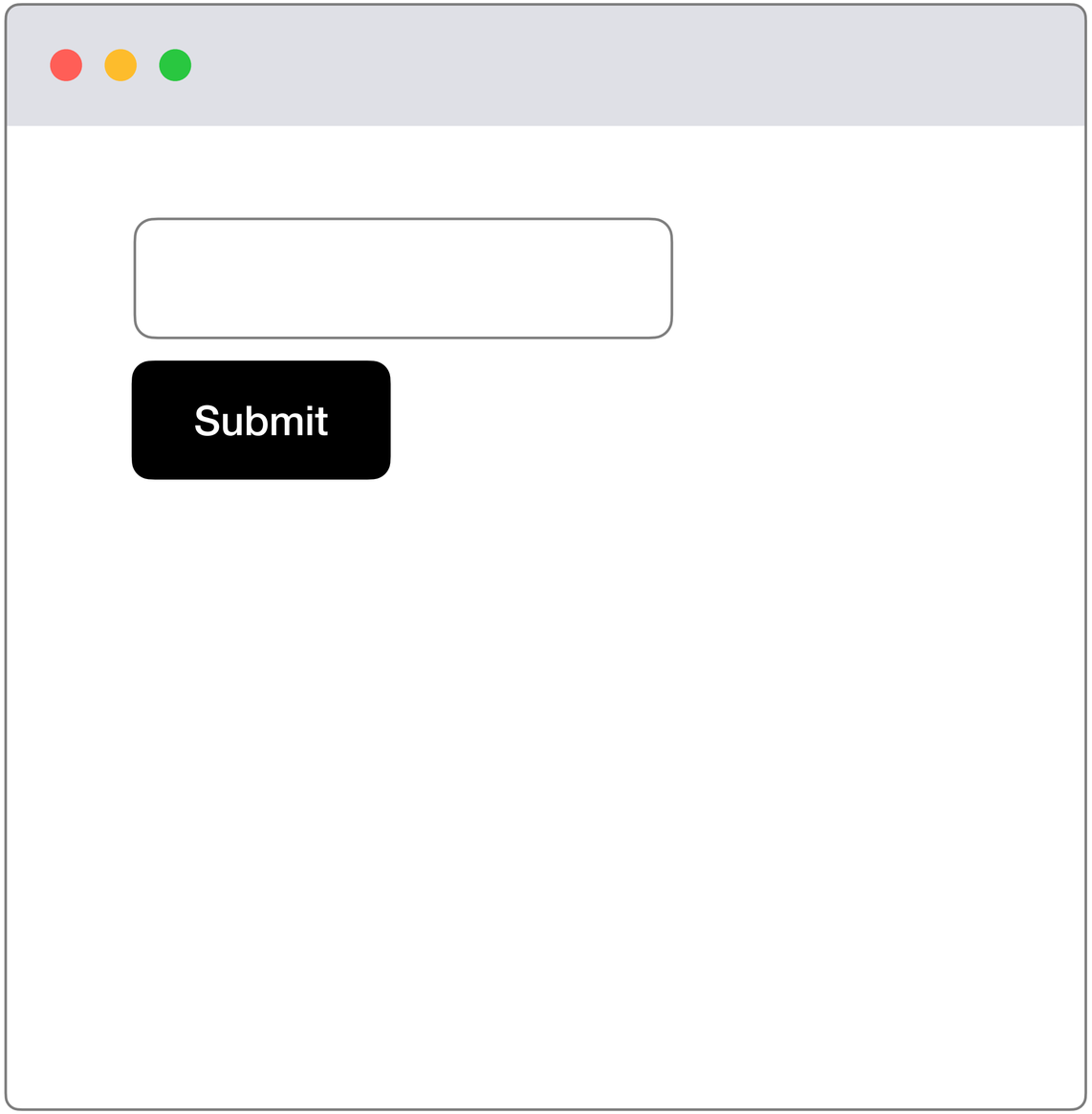
```
<form action="/" method="post">
    <input type="text">
    <button type="submit>
        Submit
    </button>
</form>
```



Request method

↓

```
<form action="/" method="post">
    <input type="text">
    <button type="submit>
        Submit
    </button>
</form>
```



Python

```
request.form.get("email")
```

HTML

```
<form action="/" method="post">
    <input name="email">
    <button type="submit>
        Submit
    </button>
</form>
```

HTML Form Elements

- `<input>`
  - `<input type="text">`
  - `<input type="radio">`
  - `<input type="checkbox">`

HTML Form Elements

- `<select>`
- `<option>`

Form Validation

(Client- and Server-side)

Python

```
request.form.get("email")
```

HTML

```
<form action="/" method="post">
    <input name="email">
    <button type="submit>
        Submit
    </button>
</form>
```

application.py

```
@app.route("/form", methods=["POST"])
def post_form():
    email = request.form.get("email")
```

application.py

```
@app.route("/form", methods=["POST"])
def post_form():
    email = request.form.get("email")

    # Save email to database
```

application.py

```
@app.route("/form", methods=["POST"])
def post_form():
    email = request.form.get("email")

    # Validate form
    if not email:

        # Show error to user

    # Save email to database
```

application.py

```
@app.route("/form", methods=["POST"])
def post_form():
    email = request.form.get("email")

    # Validate form
    if not email:

        # Show error to user
        return render_template("error.html")

    # Save email to database
```

Python

```
request.form.get("email")
```

HTML

```
<form action="/" method="post">
    <input name="email">
    <button type="submit>
        Submit
    </button>
</form>
```

form.html

```
<form action="/" method="post">
    <input name="email">
    <button type="submit>
        Submit
    </button>
</form>
```

form.html

```
<form action="/" method="post">
    <input name="email" type="text">
    <button type="submit>
        Submit
    </button>
</form>
```

form.html

```
<form action="/" method="post">
    <input name="email" type="email">
    <button type="submit>
        Submit
    </button>
</form>
```

form.html

```
<form action="/" method="post">
    <input name="email" type="email" required>
    <button type="submit>
        Submit
    </button>
</form>
```

Jinja

Sheet

- Create a table to display the data from your CSV file.
    - **If feeling more comfortable,** add Bootstrap features, such as row highlighting, striped rows, etc.
    - **If feeling more comfortable,** add another question to your survey and update your application to save/display its responses.

Databases

```
sqlite> CREATE TABLE responses (
   ...>     id INTEGER,
   ...>     name TEXT,
   ...>     PRIMARY KEY(id)
   ...> );
```

responses

id	name

```
sqlite> INSERT INTO responses (name)
   ...> VALUES ('Carter');
```

responses

id	name

```
sqlite> INSERT INTO responses (name)
   ...> VALUES ('Carter');
```

responses

id	name
1	Carter

```
sqlite> INSERT INTO responses (name)
   ...> VALUES ('Cecelia');
```

responses

id	name
1	Carter

```
sqlite> INSERT INTO responses (name)
   ...> VALUES ('Cecelia');
```

responses

id	name
1	Carter
2	Cecelia

```
db.execute("INSERT INTO responses (name)
            VALUES ('Alyssa');")
```

responses

id	name
1	Carter
2	Cecelia

```
db.execute("INSERT INTO responses (name)
            VALUES ('Alyssa');")
```

responses

id	name
1	Carter
2	Cecelia
3	Alyssa

```
db.execute("INSERT INTO responses (name)
            VALUES (?);", placeholder)
```

responses

id	name
1	Carter
2	Cecelia
3	Alyssa

Submission

- **Submit code files to Gradescope** by Thursday, March 2, 3:10 PM.
- Graded based on completion, but please double check to be sure your files are named correctly:
  - `application.py` **not** `application (1).py`