[220] Web 2

Learning Objectives Today

Make your own website!

Learn HTML Basics

- syntax for tags, attributes, etc
- hyperlinks, tables, images

Generate HTML

- links
- tables
- multiple pages

Outline

Hypertext

Tag Syntax

Hyperlinks and Attributes

Images

Tables

Self Learning

Hypertext

Two steps for dealing with Hypertext:

1. how to retrieve hypertext
2. how to display hypertext

index.html (common home page name)

Welcome to the home page!

Please visit the other pages:

- about
- contact

Hypertext is text with clickable links to other pages

contact.html

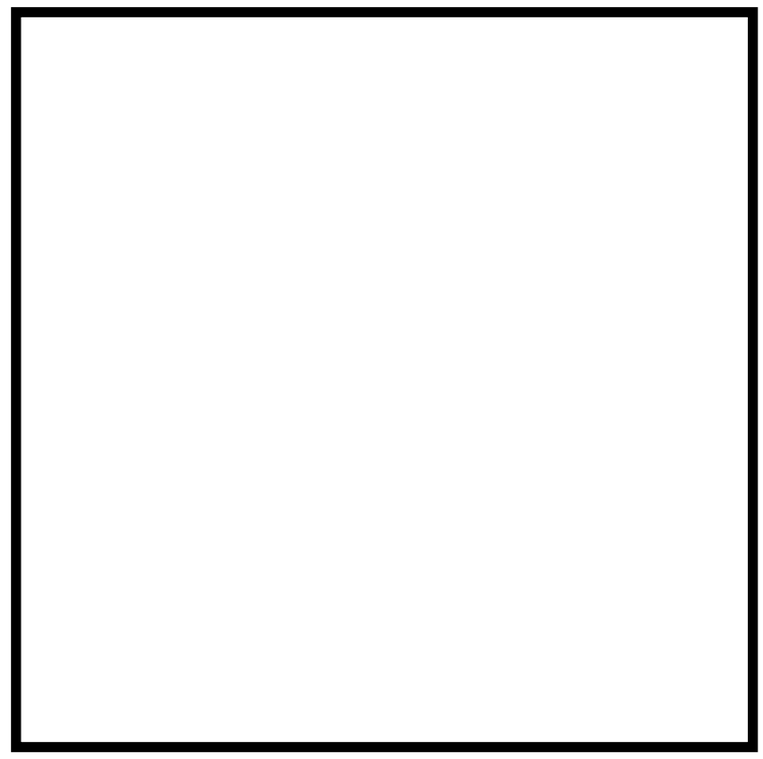
Contact Us

Email: tharter@wisc.edu

Phone: 123-456-7890

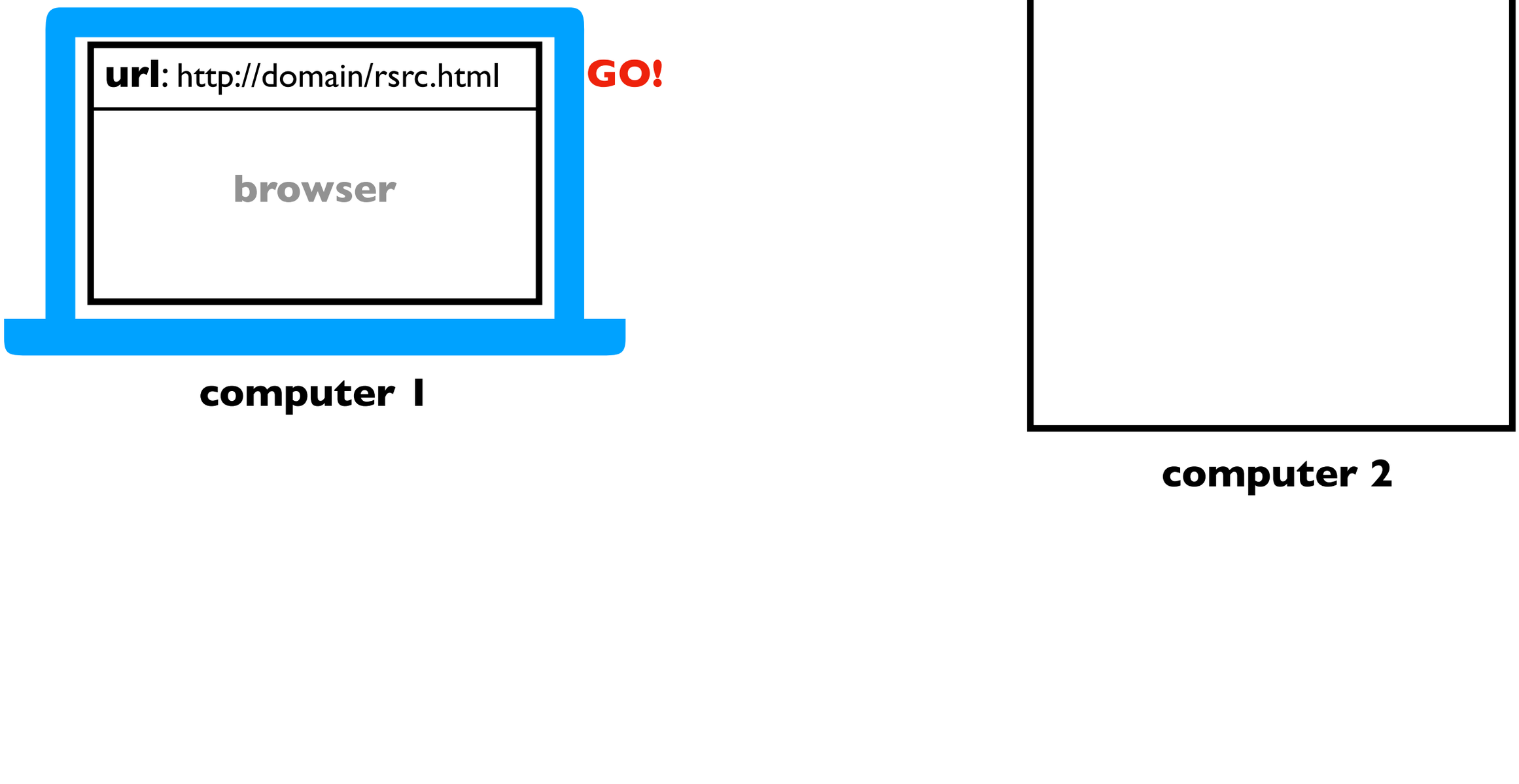
Hypertext

computer 1



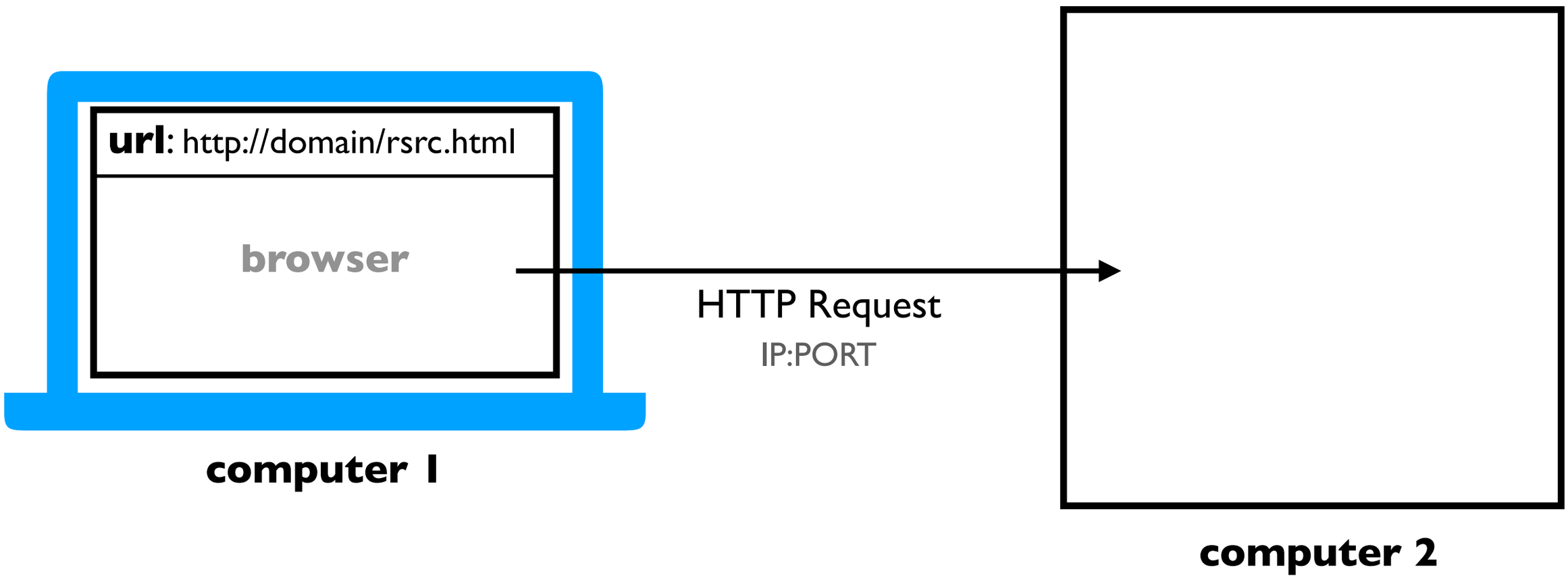
computer 2

Hypertext



Hypertext

Step 1: use HTTP (Hypertext Transfer Protocol) to **transfer** page

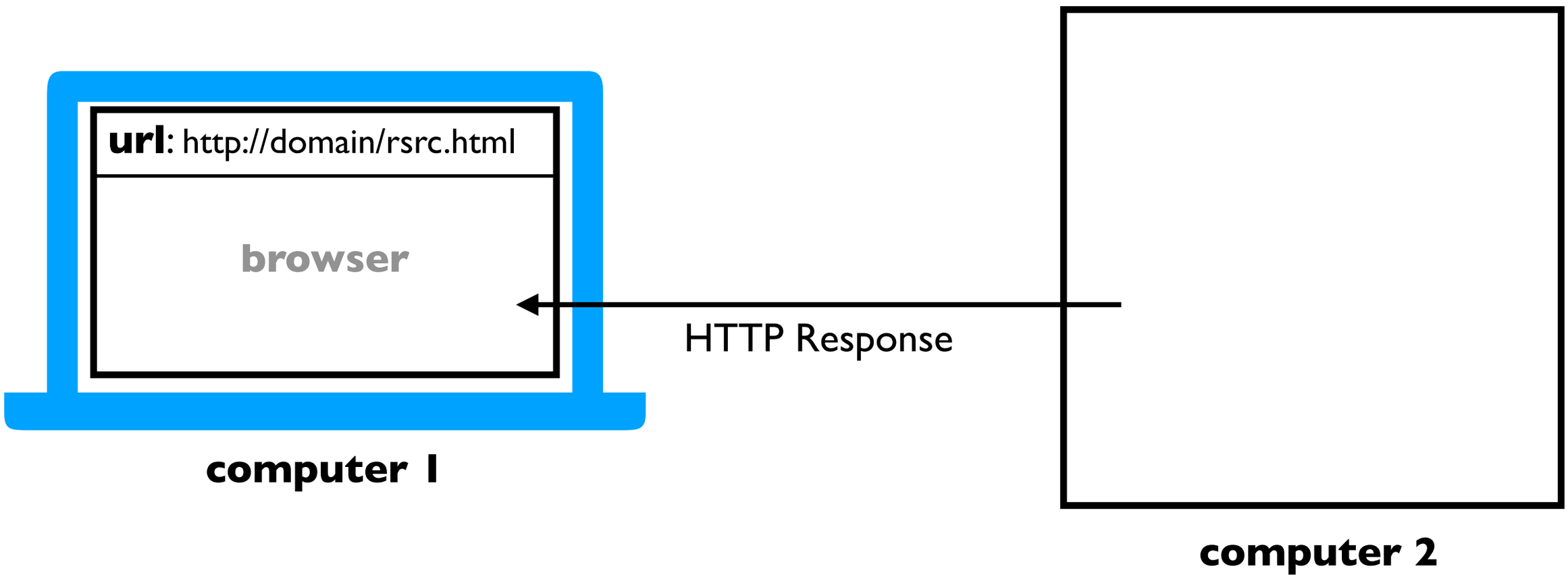


HTTP Request:

```
GET /rsrc.html HTTP/1.1
Host: example.com
User-Agent: ...
Accept: */*
```

Hypertext

Step 1: use HTTP (Hypertext Transfer Protocol) to **transfer** page



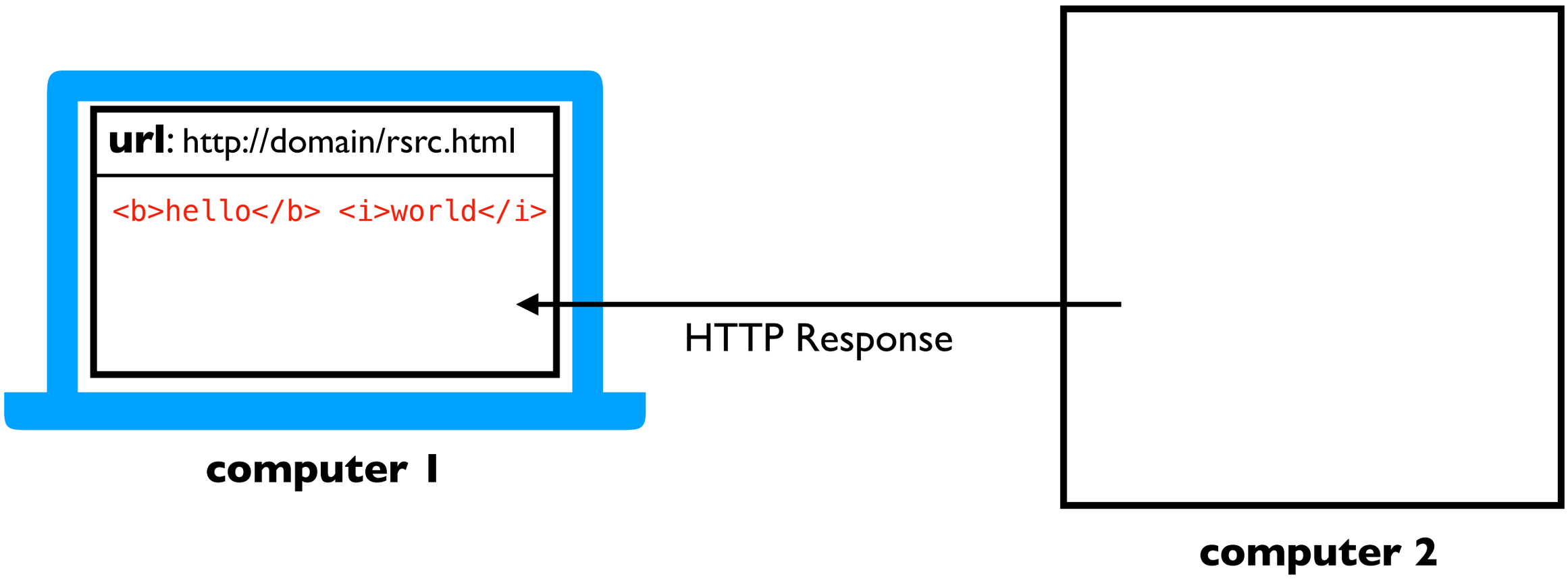
HTTP Response:

```
HTTP/1.0 200 OK
Content-Type: text/html; charset=utf-8
Content-Length: 74

<b>hello</b> <i>world</i>
```

Hypertext

Step 1: use HTTP (Hypertext Transfer Protocol) to **transfer** page
Step 2: parse HTML (Hypertext Markup Language) to **render** page



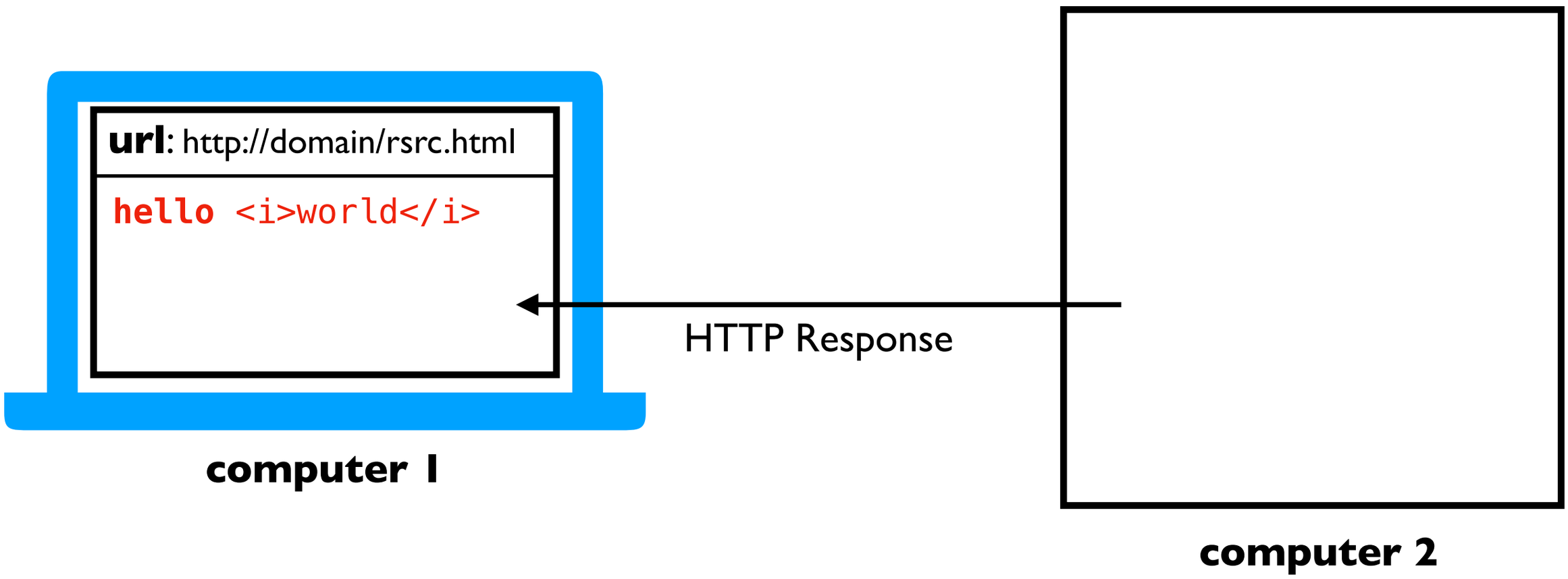
HTTP Response:

```
HTTP/1.0 200 OK
Content-Type: text/html; charset=utf-8
Content-Length: 74

<b>hello</b> <i>world</i>
```

Hypertext

Step 1: use HTTP (Hypertext Transfer Protocol) to **transfer** page
Step 2: parse HTML (Hypertext Markup Language) to **render** page



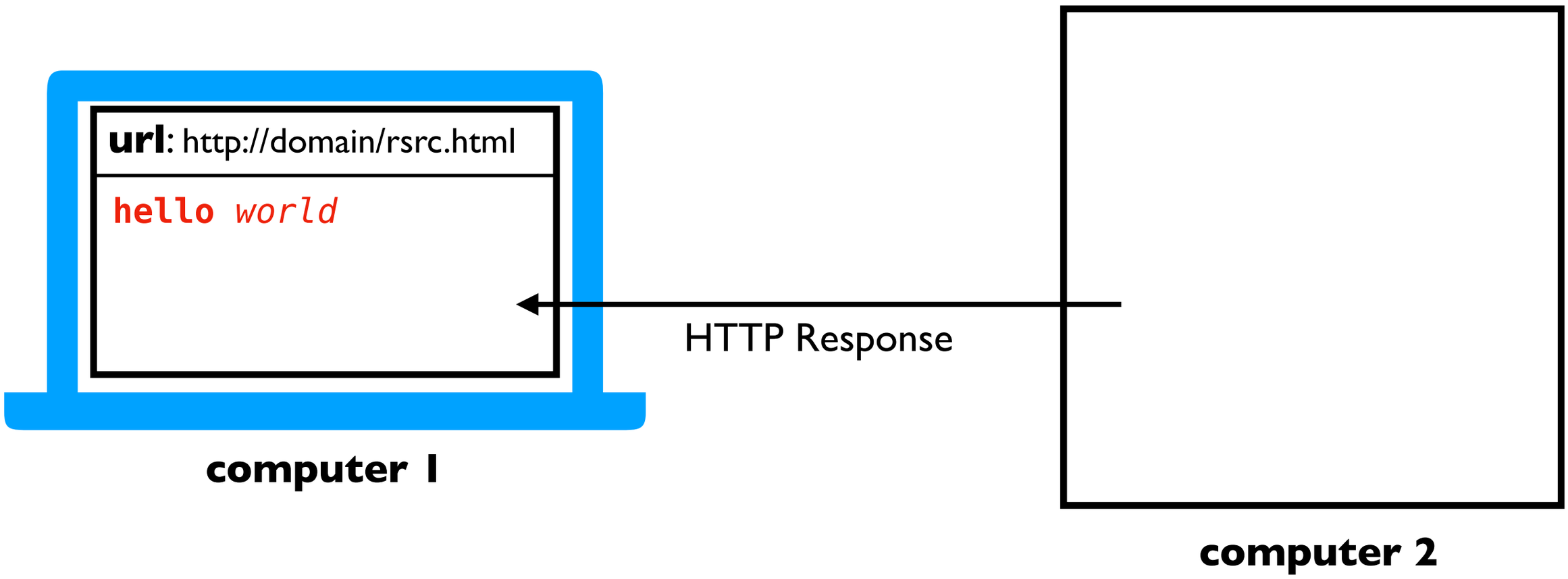
HTTP Response:

```
HTTP/1.0 200 OK
Content-Type: text/html; charset=utf-8
Content-Length: 74

<b>hello</b> <i>world</i>
```

Hypertext

Step 1: use HTTP (Hypertext Transfer Protocol) to **transfer** page
Step 2: parse HTML (Hypertext Markup Language) to **render** page



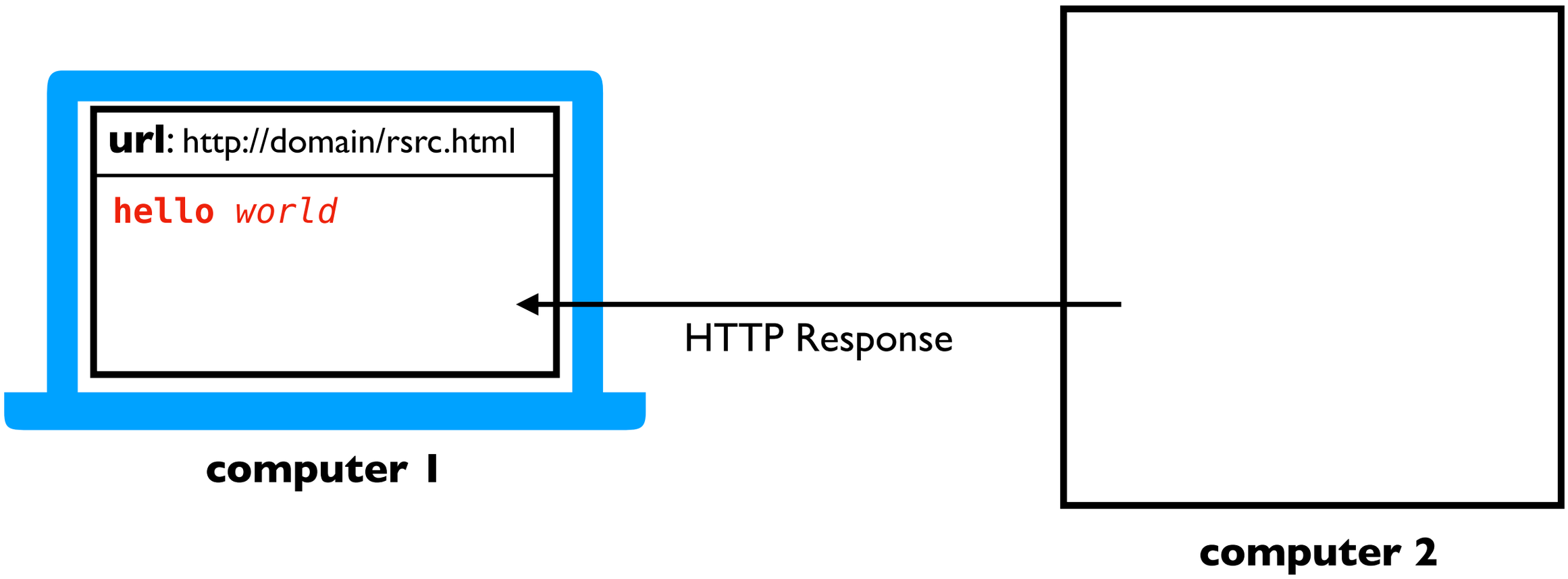
HTTP Response:

```
HTTP/1.0 200 OK
Content-Type: text/html; charset=utf-8
Content-Length: 74

<b>hello</b> <i>world</i>
```

Hypertext

Step 1: use HTTP (Hypertext Transfer Protocol) to **transfer** page
Step 2: parse HTML (Hypertext Markup Language) to **render** page



HTTP Response:

```
HTTP/1.0 200 OK
Content-Type: text/html; charset=utf-8
Content-Length: 74

<b>hello</b> <i>world</i>
```

today we'll learn how to write HTML

Text files vs HTML files

Compare:

https://tyler.caraza-harter.com/hello.txt

https://tyler.caraza-harter.com/hello.html

Inspecting:

- dev tools
- view source
- download page source (open locally)

Outline

Hypertext

Tag Syntax

Hyperlinks and Attributes

Images

Tables

Self Learning

HTML Tags

We can enclose text in "tags" to change how it is displayed

- often tags come in pairs (to indicate range of text to format)

this part gets special formatting
different tags have different effects

this is regular text that is before <TAG>special text</TAG> followed by more regular text

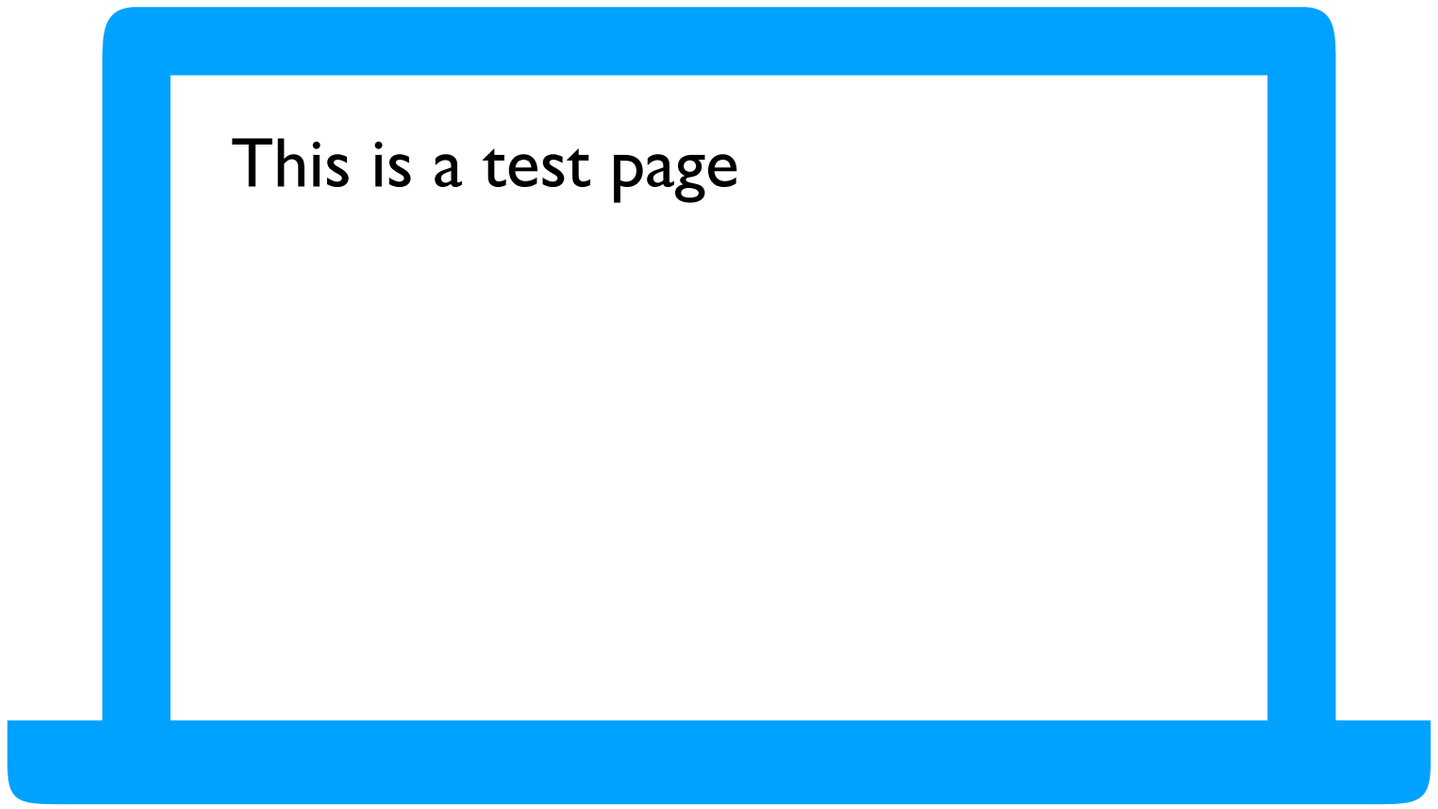
opening tag:
tag name in angle brackets

closing tag:
slash and tag name
in angle brackets

Simple Tags

test.html

This is a test page

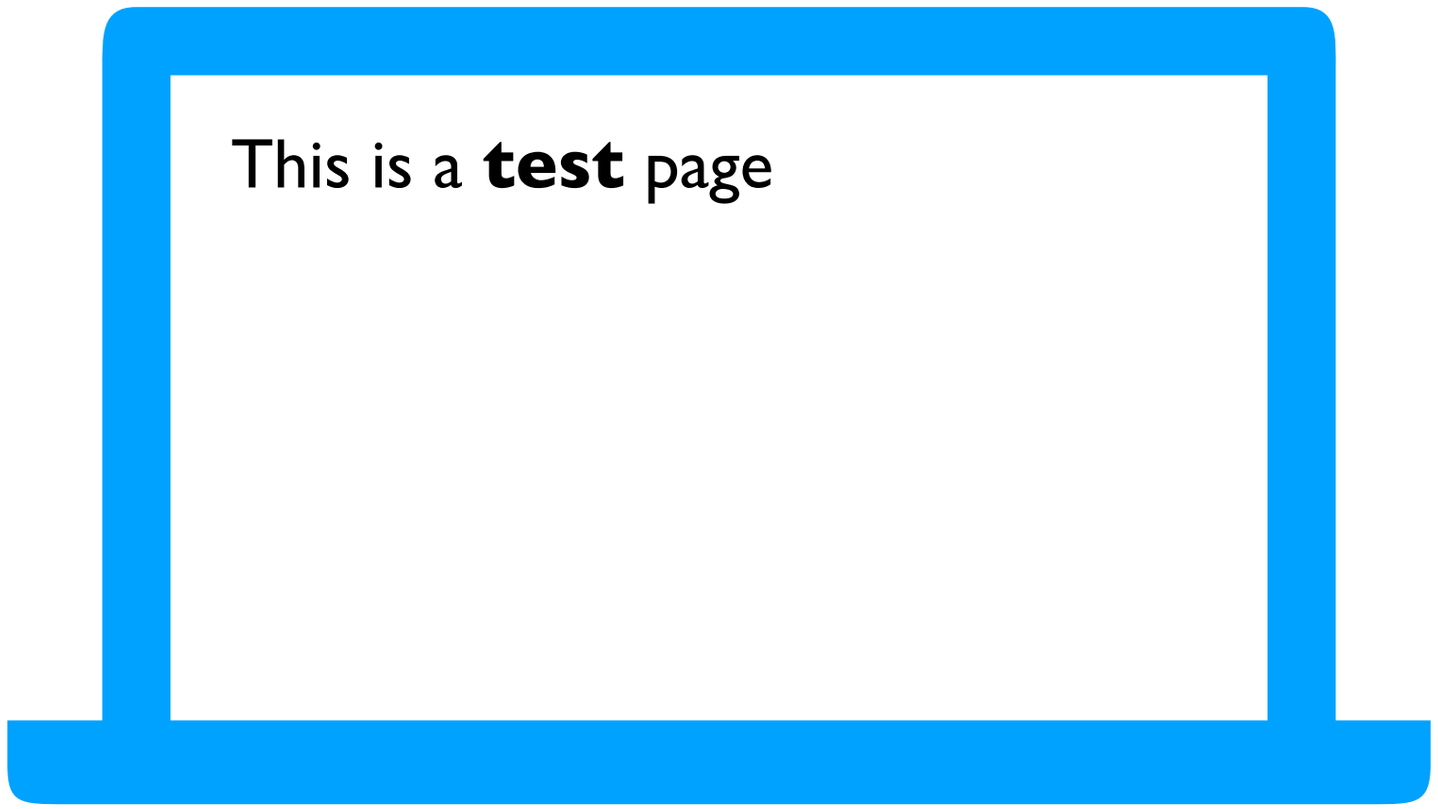


Simple Tags

b: bold

test.html

This is a test page

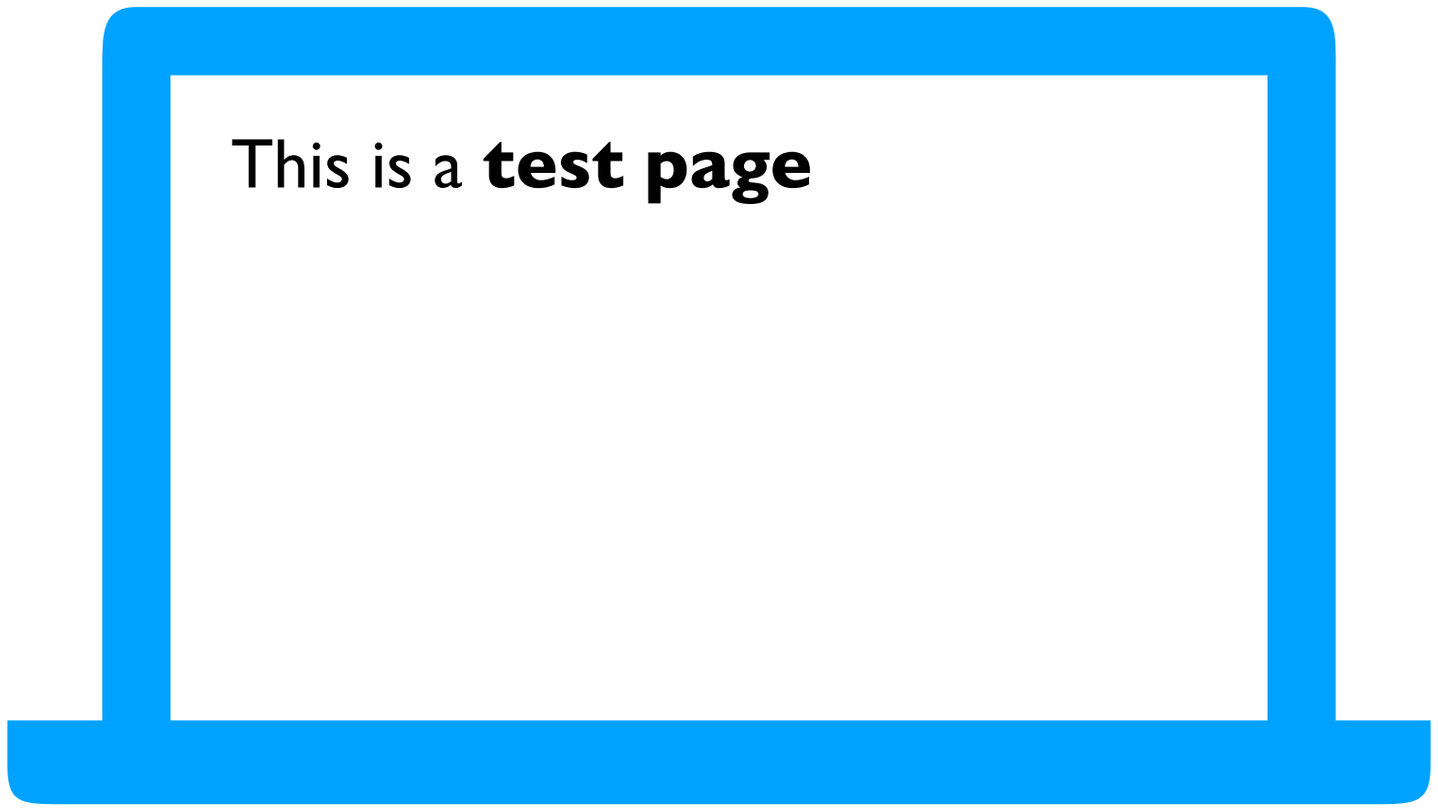


Simple Tags

b: bold

test.html

This is a test page

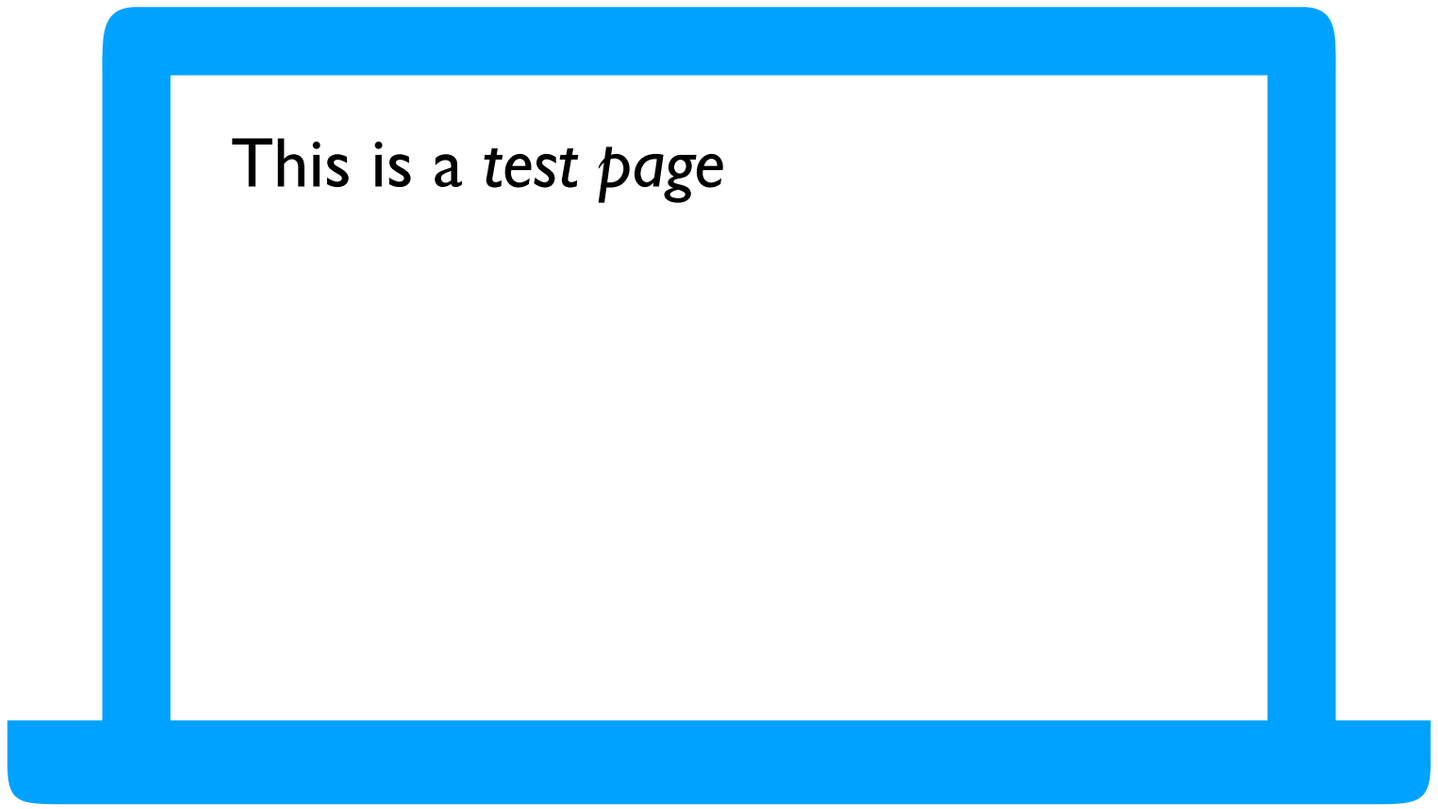


Simple Tags

i: italic

test.html

This is a test page

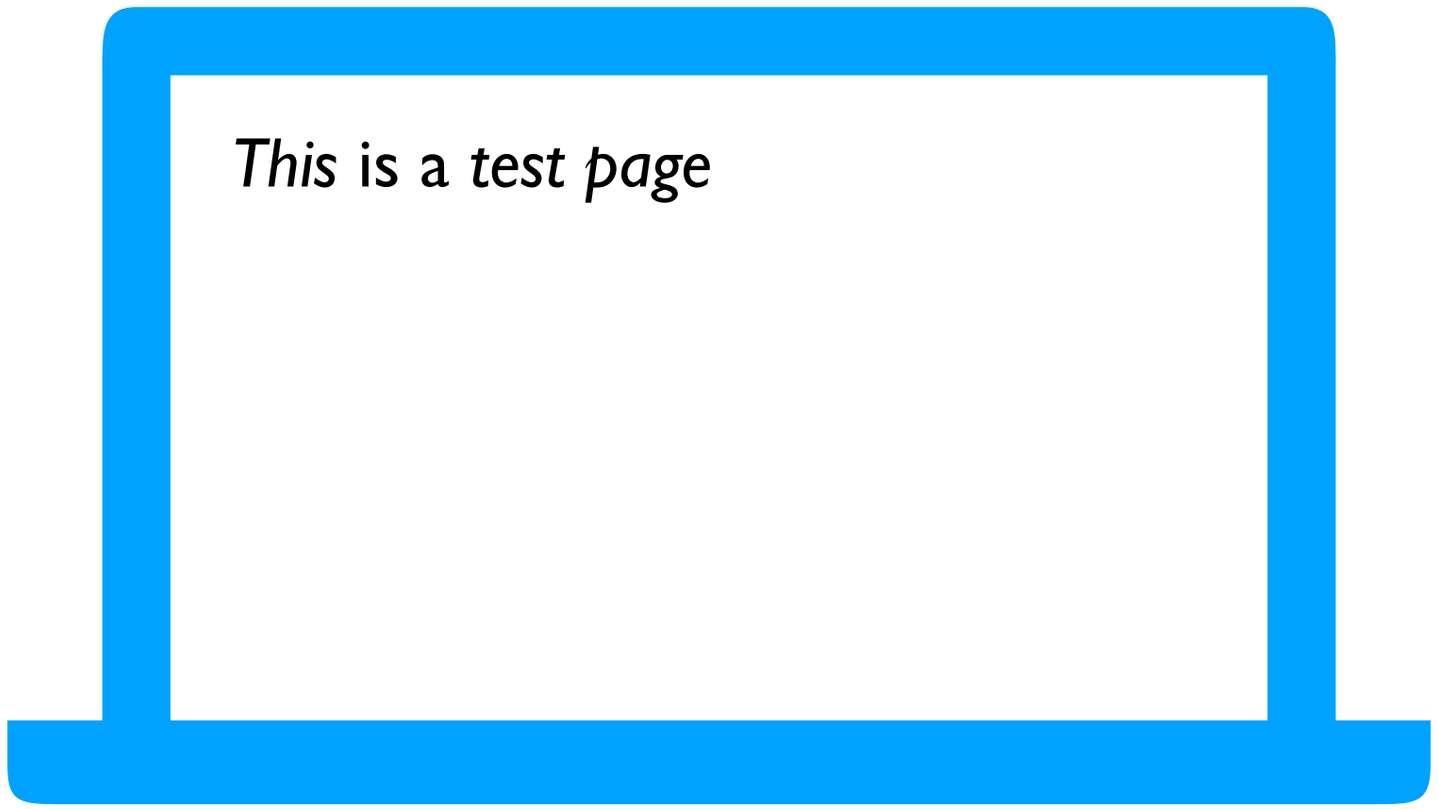


Simple Tags

i: italic

test.html

```
<i>This</i> is a <i>test page</i>
```

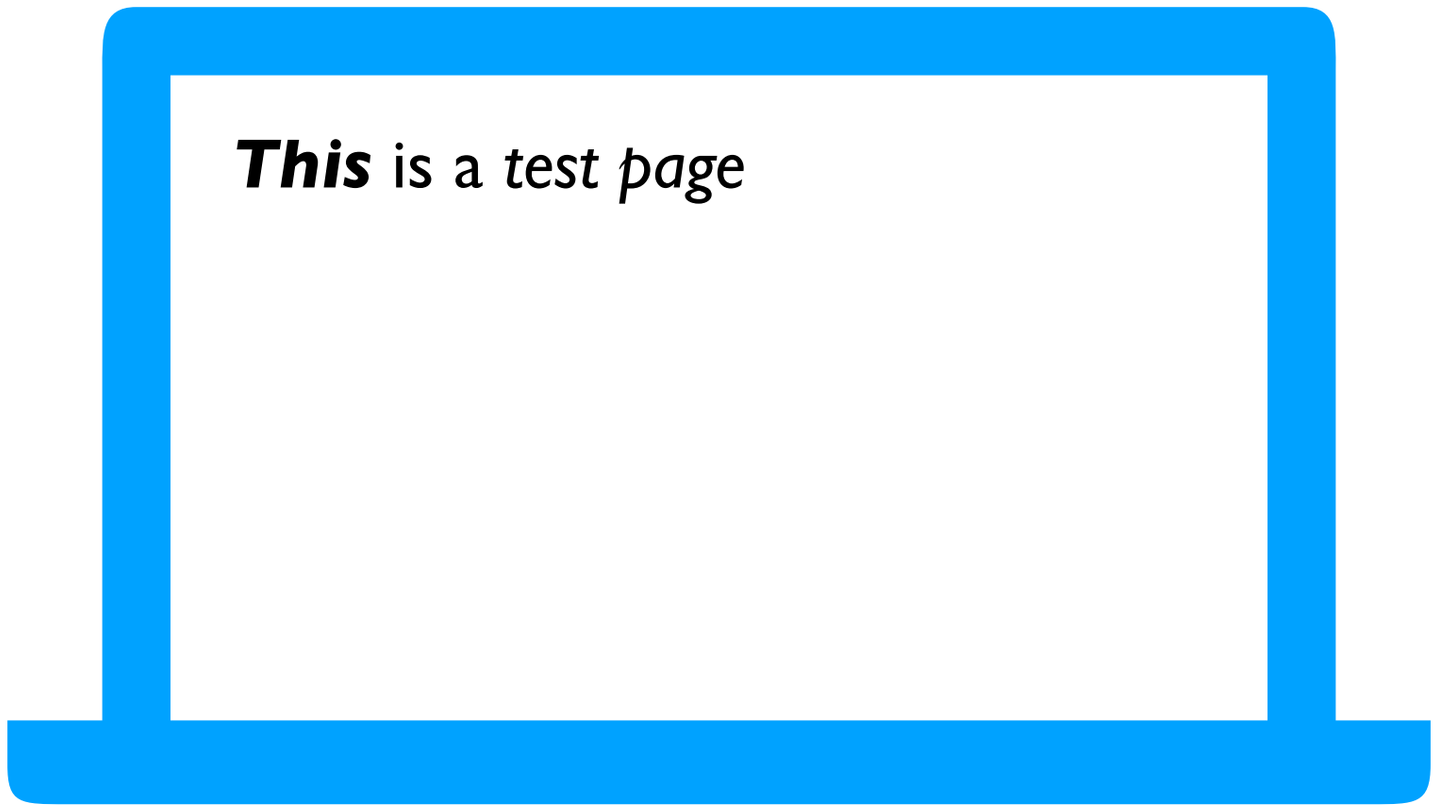


Simple Tags

i: italic

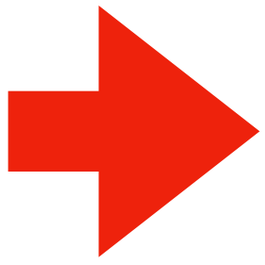
test.html

```
<i><b>This</b></i> is a <i>test
page</i>
```



Vertical Space

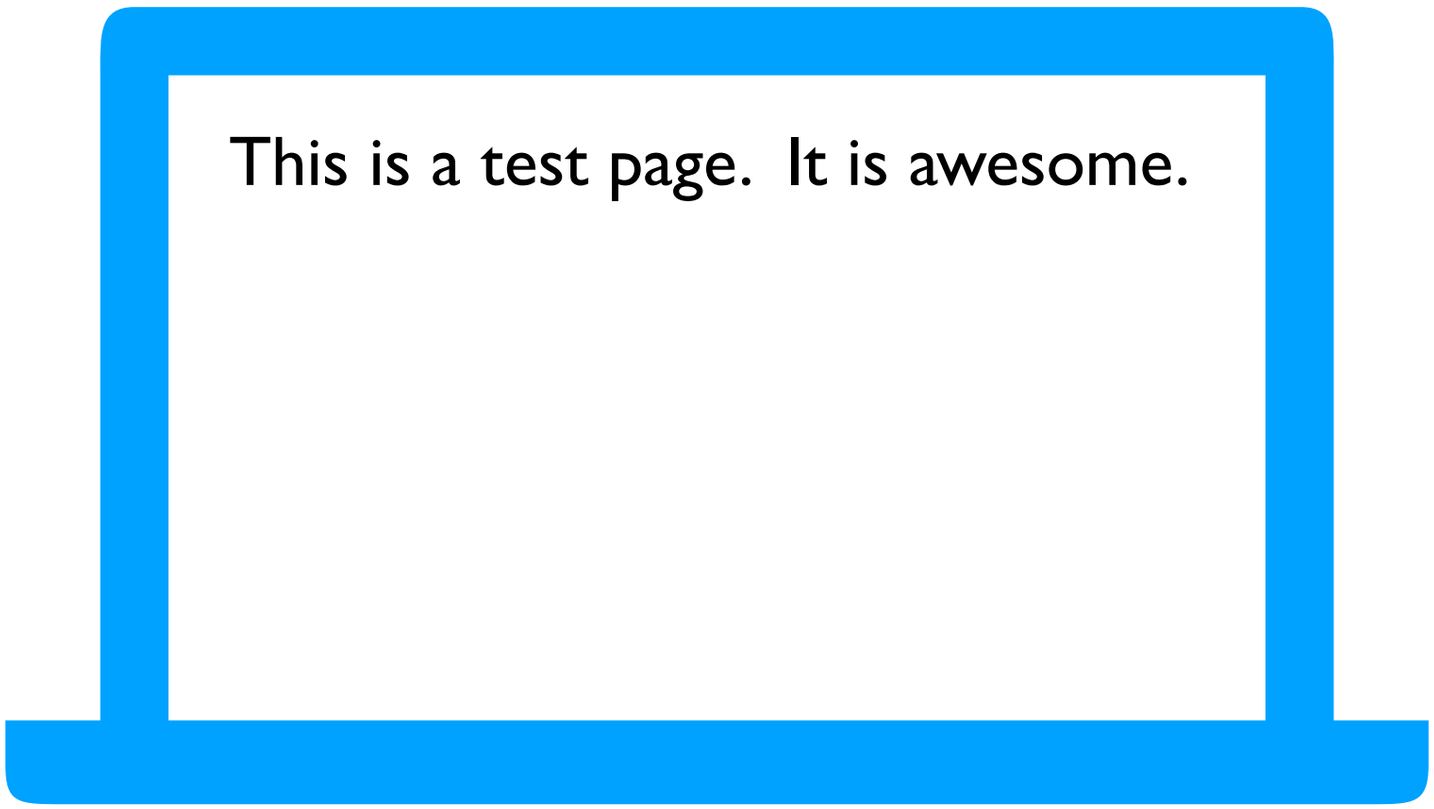
whitespace in
html is ignored



test.html

This is a test page.

It is awesome.



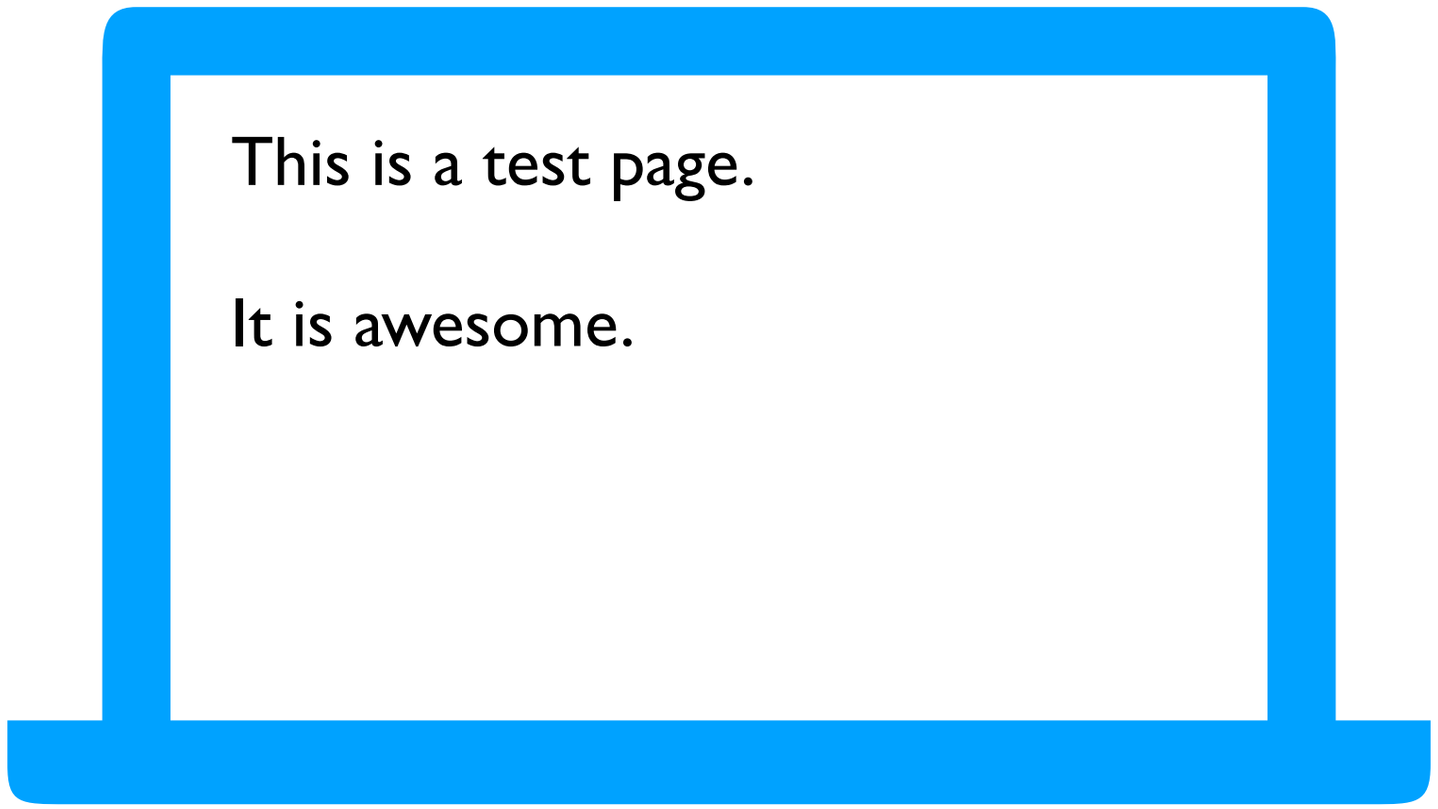
Vertical Space

p: paragraph

test.html

```
<p>This is a test page.</p>

<p>It is awesome.</p>
```



Vertical Space

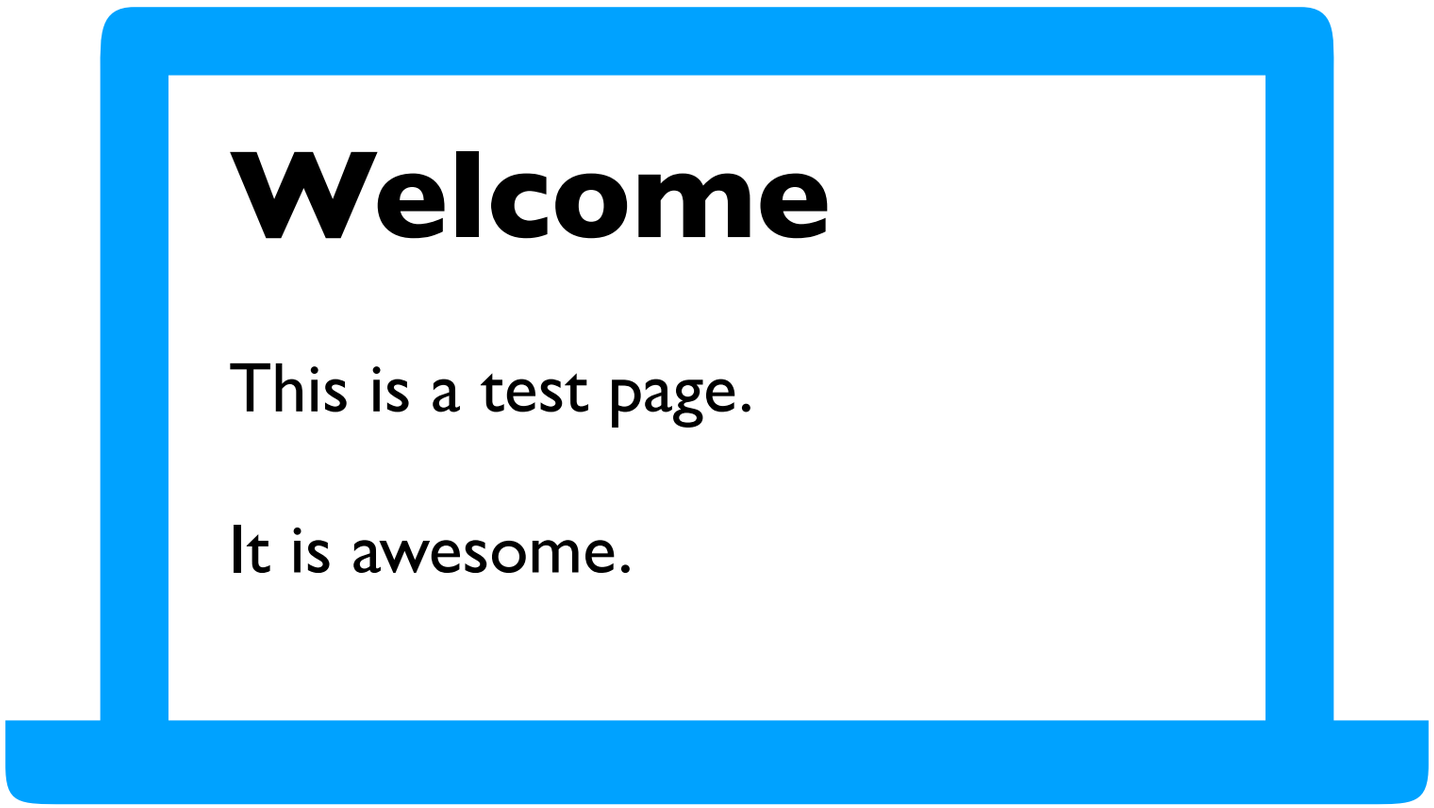
h1: big header

test.html

```
<h1>Welcome</h1>

<p>This is a test page.</p>

<p>It is awesome.</p>
```



Vertical Space

h1: big header

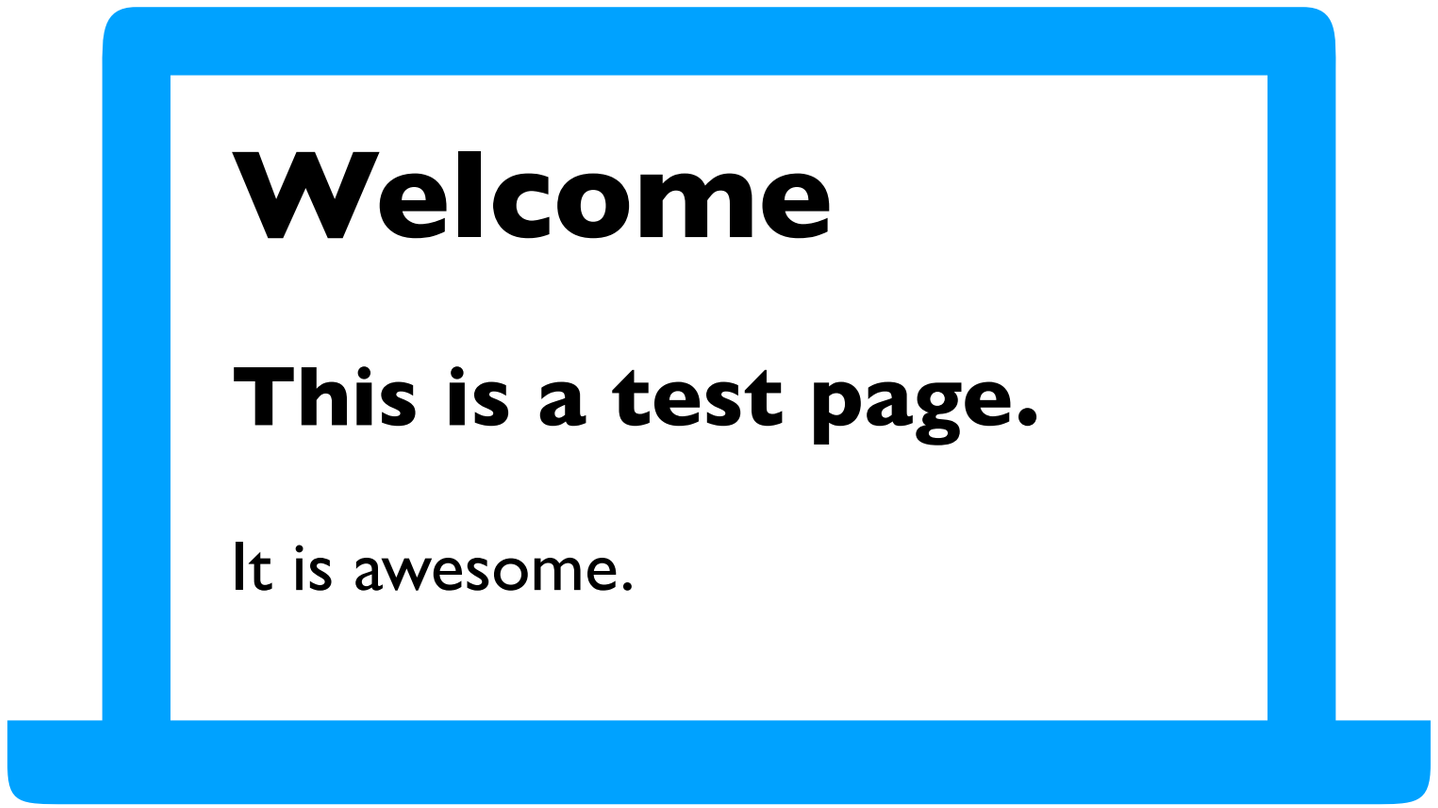
h2: smaller header

test.html

```
<h1>Welcome</h1>

<h2>This is a test page.</h2>

<p>It is awesome.</p>
```



Vertical Space

h1: big header

h2: smaller header

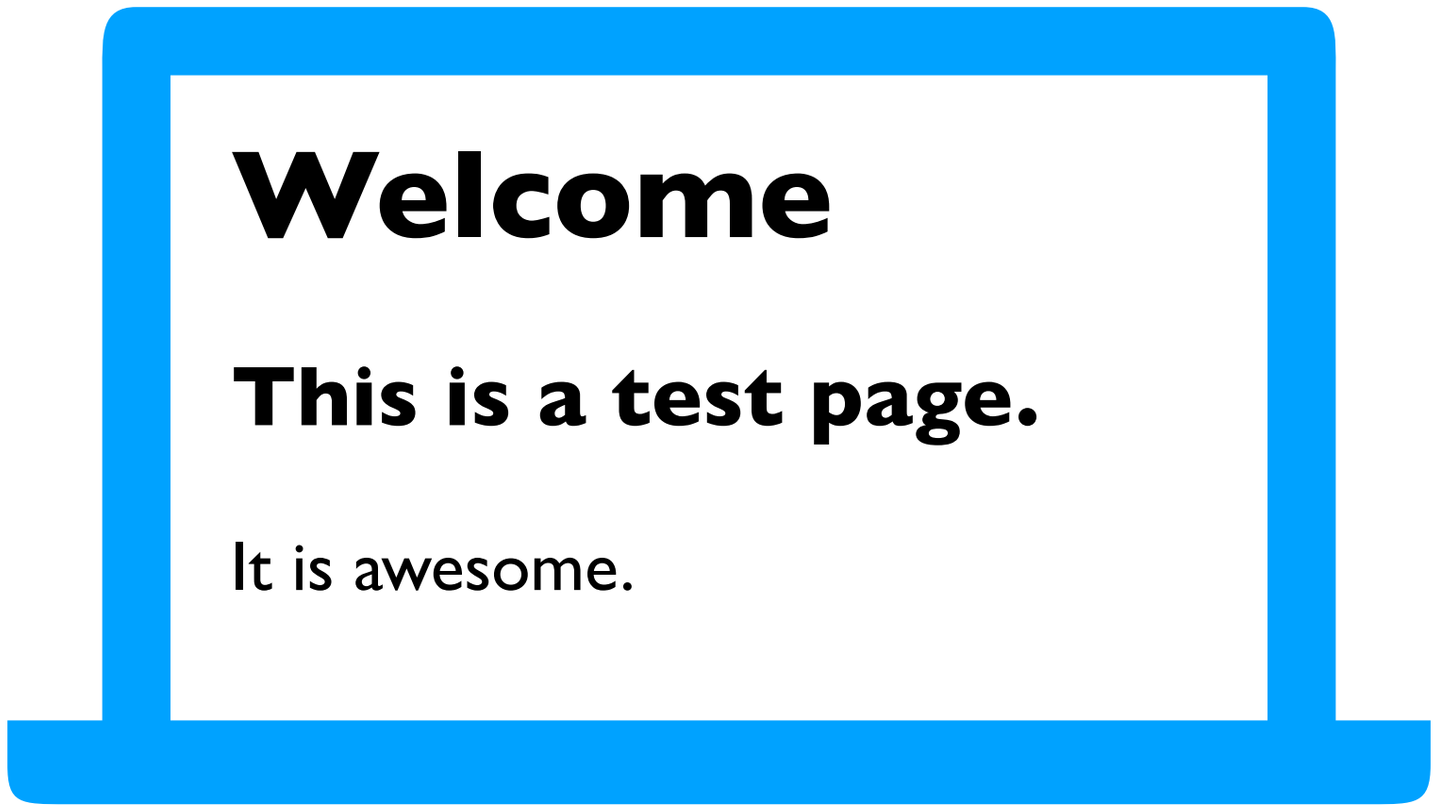
hN: etc

test.html

```
<h1>Welcome</h1>

<h2>This is a test page.</h2>

<p>It is awesome.</p>
```

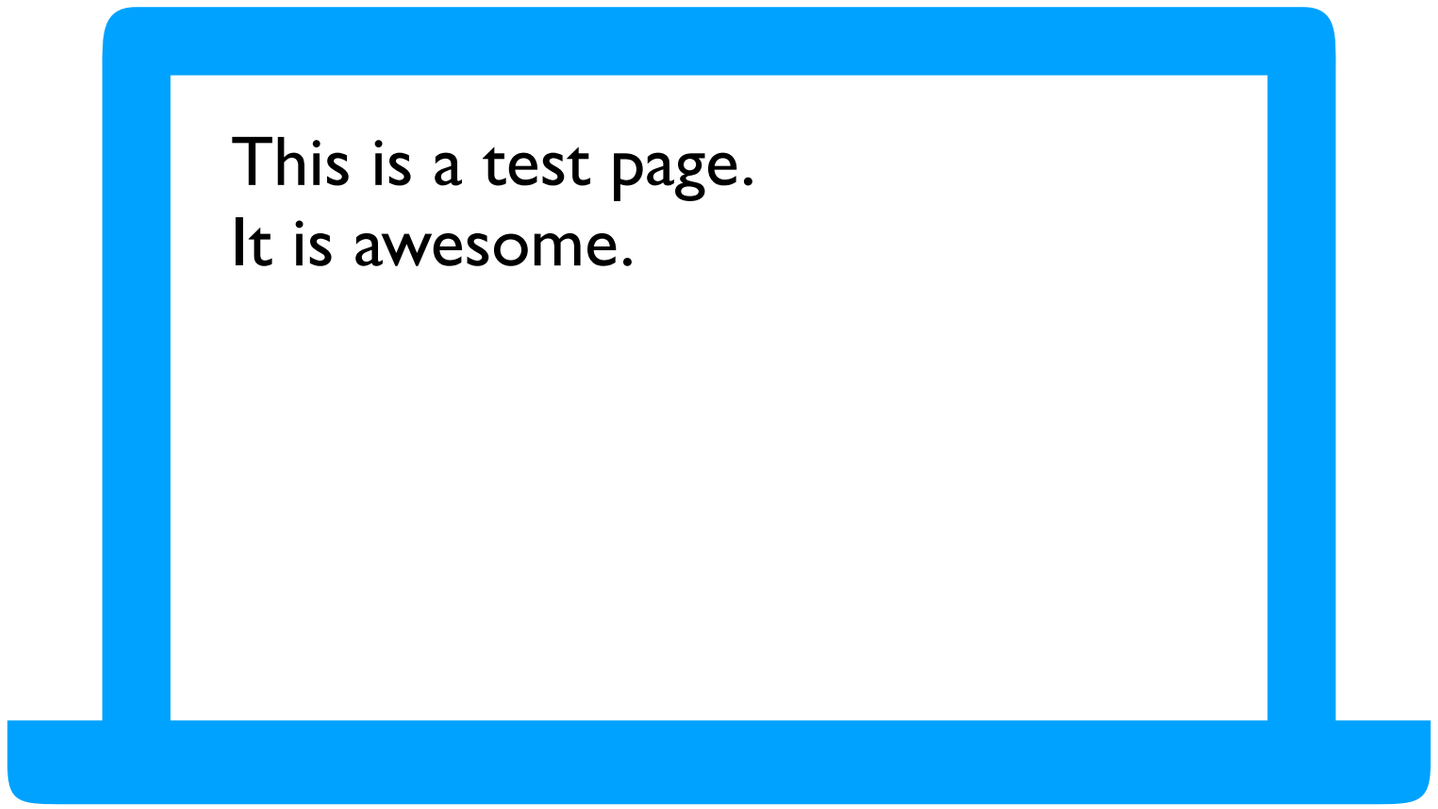


Vertical Space

br: line break

test.html

This is a test page.
**
**
It is awesome.



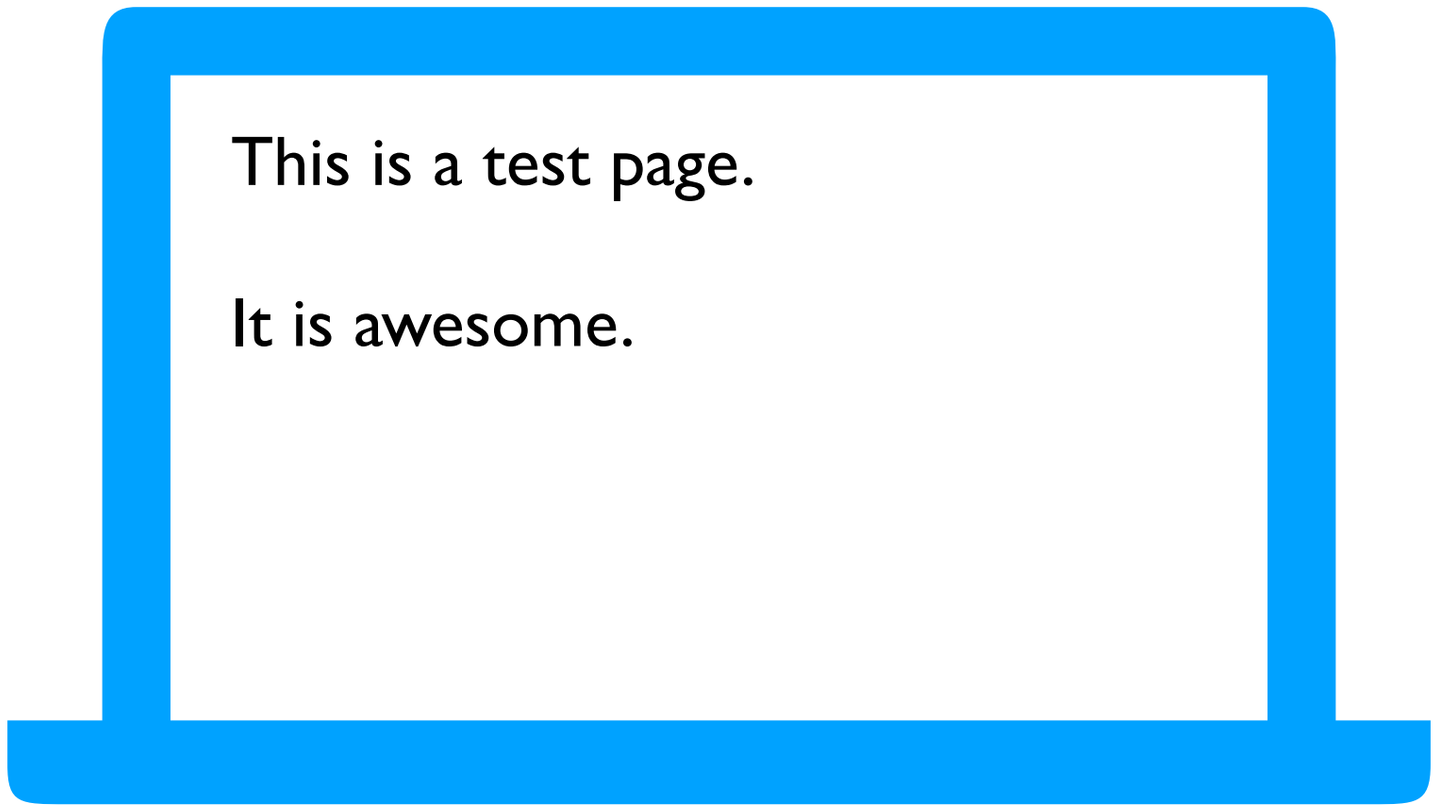
Vertical Space

br: line break

test.html

This is a test page.
**

**
It is awesome.



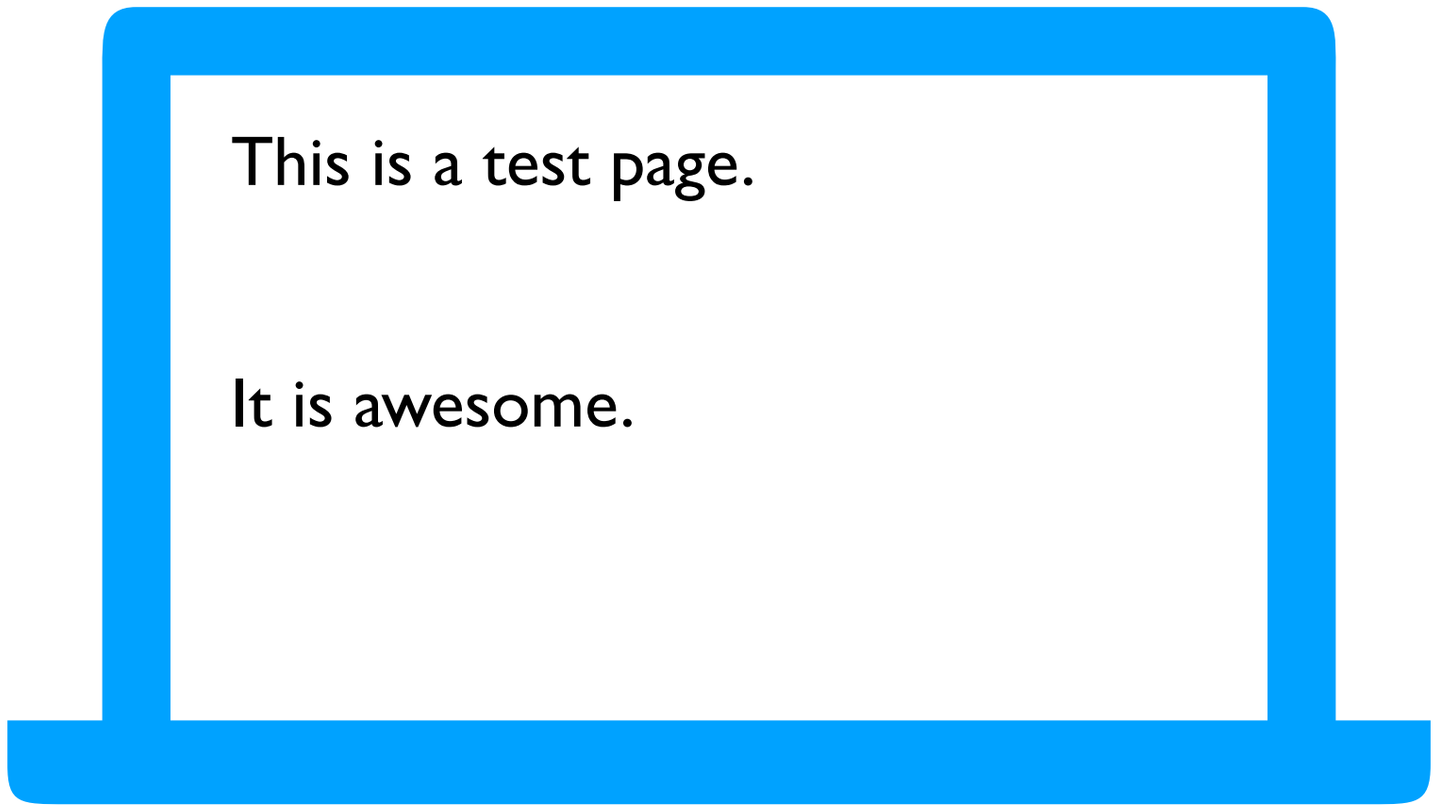
Vertical Space

br: line break

test.html

This is a test page.
**

**
It is awesome.



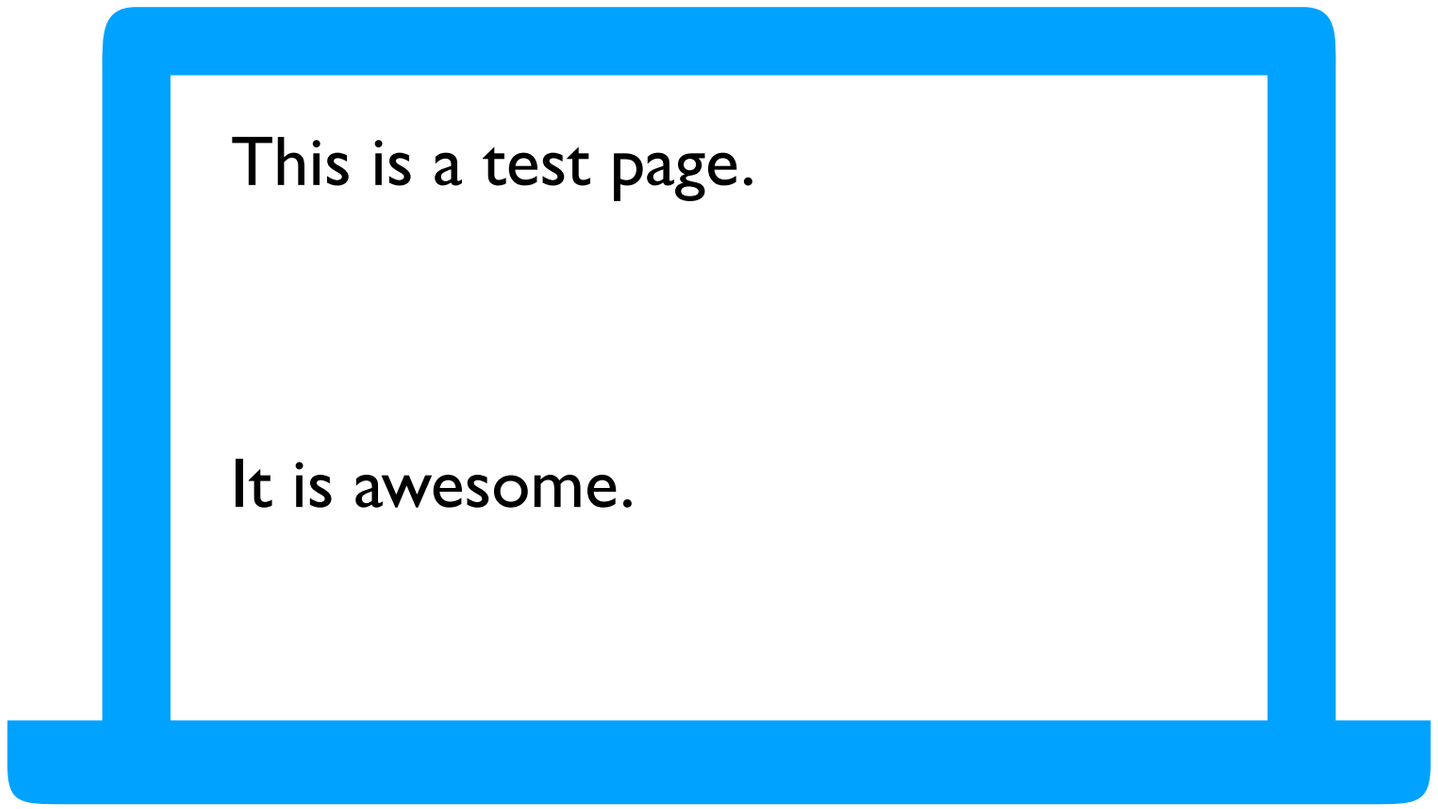
Vertical Space

br: line break

test.html

This is a test page.
**

**
It is awesome.



Vertical Space

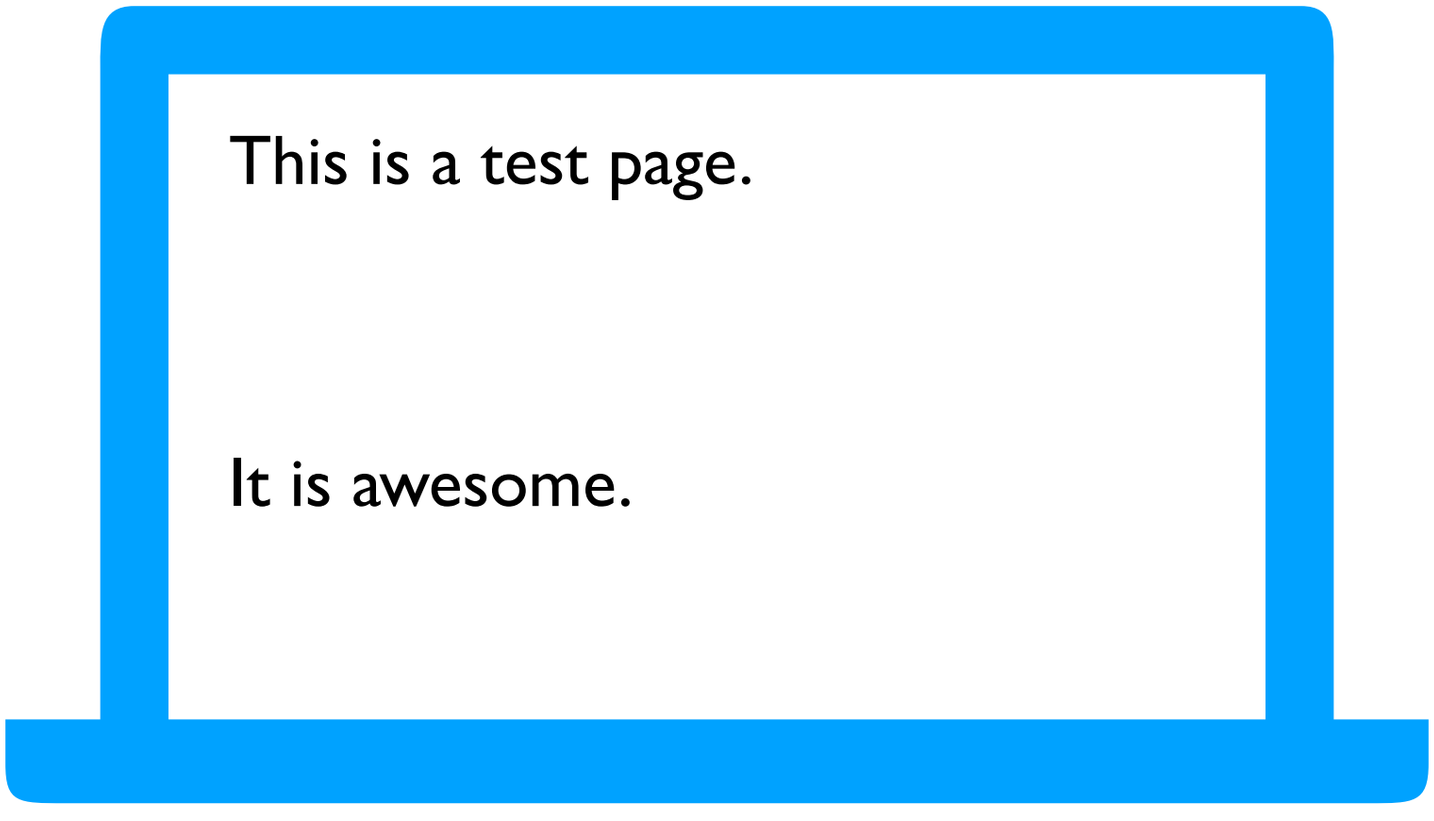
br: line break

test.html

This is a test page.
**

**
It is awesome.

note there is no closing tag
(these are known as void elements)



Vertical Space

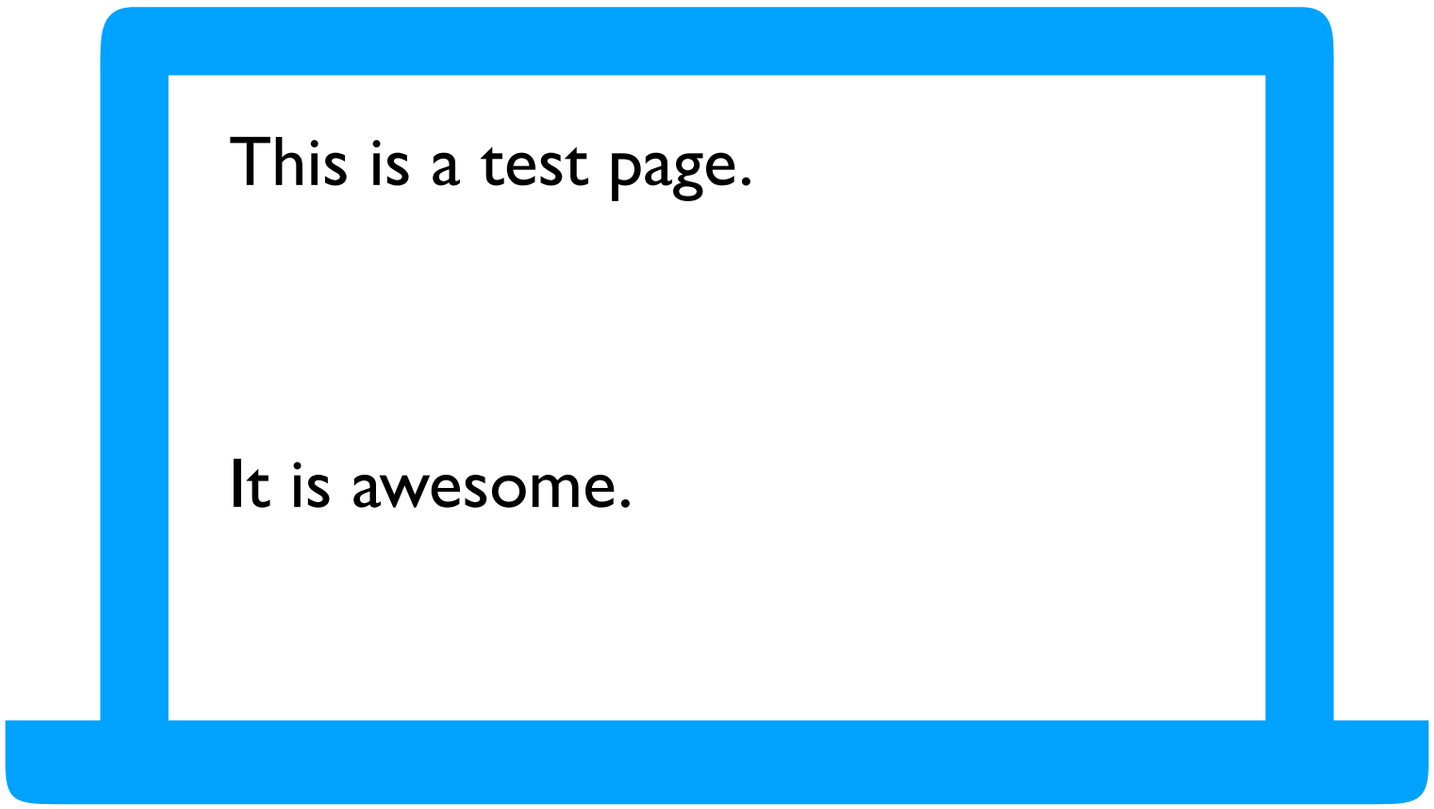
br: line break

test.html

This is a test page.
**

**
It is awesome.

sometimes you'll encounter it like this

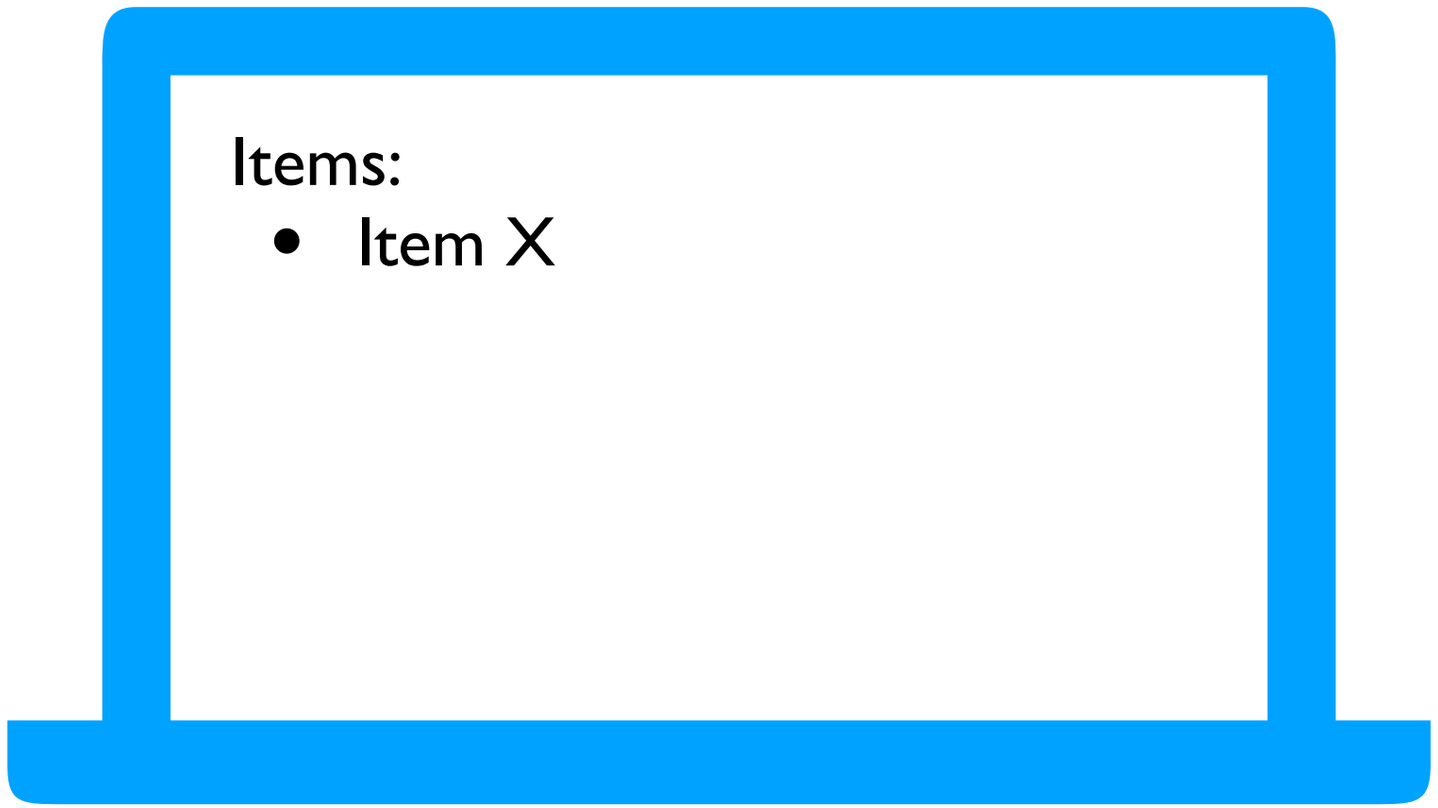


Lists

ul: unordered list
li: list item

test.html

```
Items:
<ul>
    <li>Item X</li>
</ul>
```

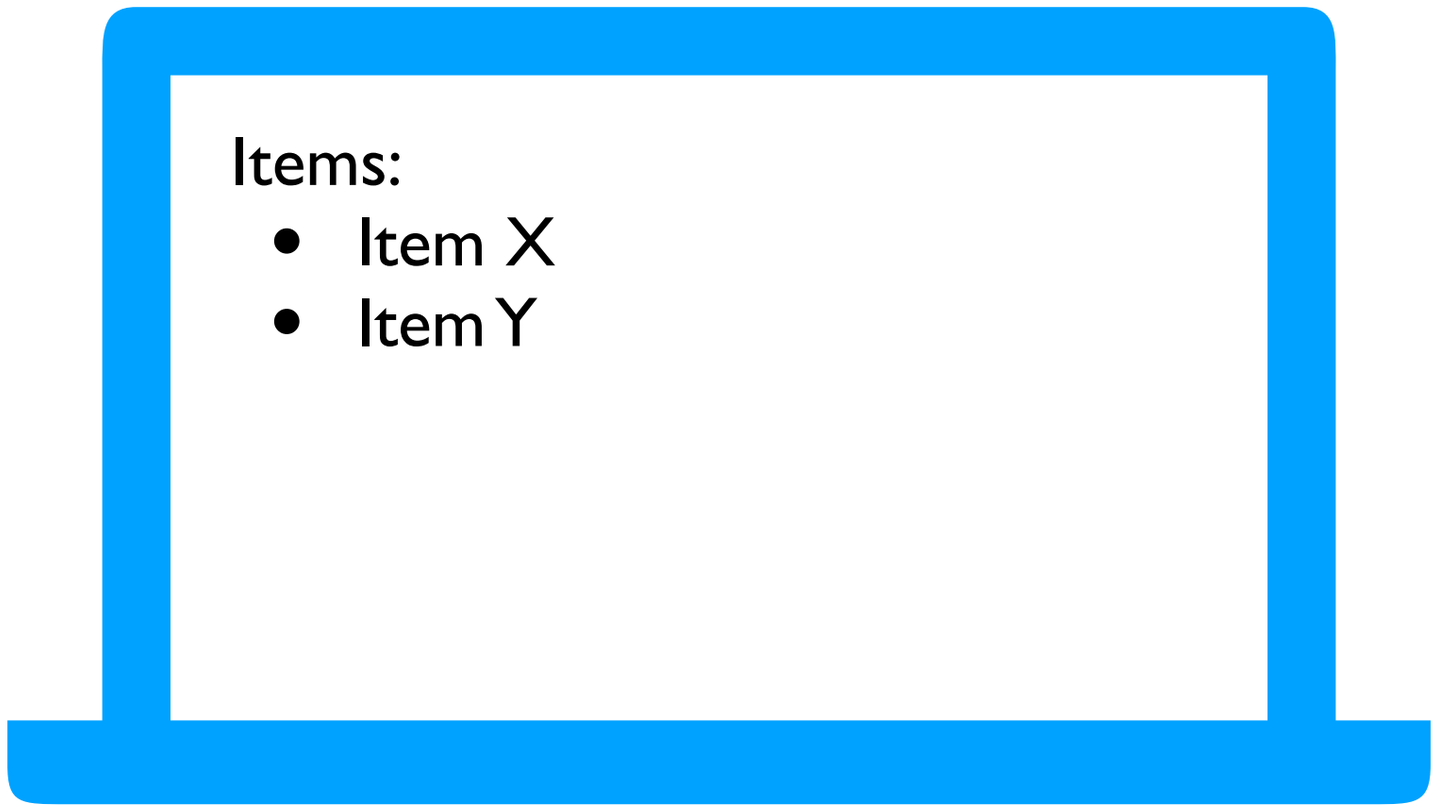


Lists

ul: unordered list
li: list item

test.html

```
Items:
<ul>
    <li>Item X</li>
    <li>Item Y</li>
</ul>
```

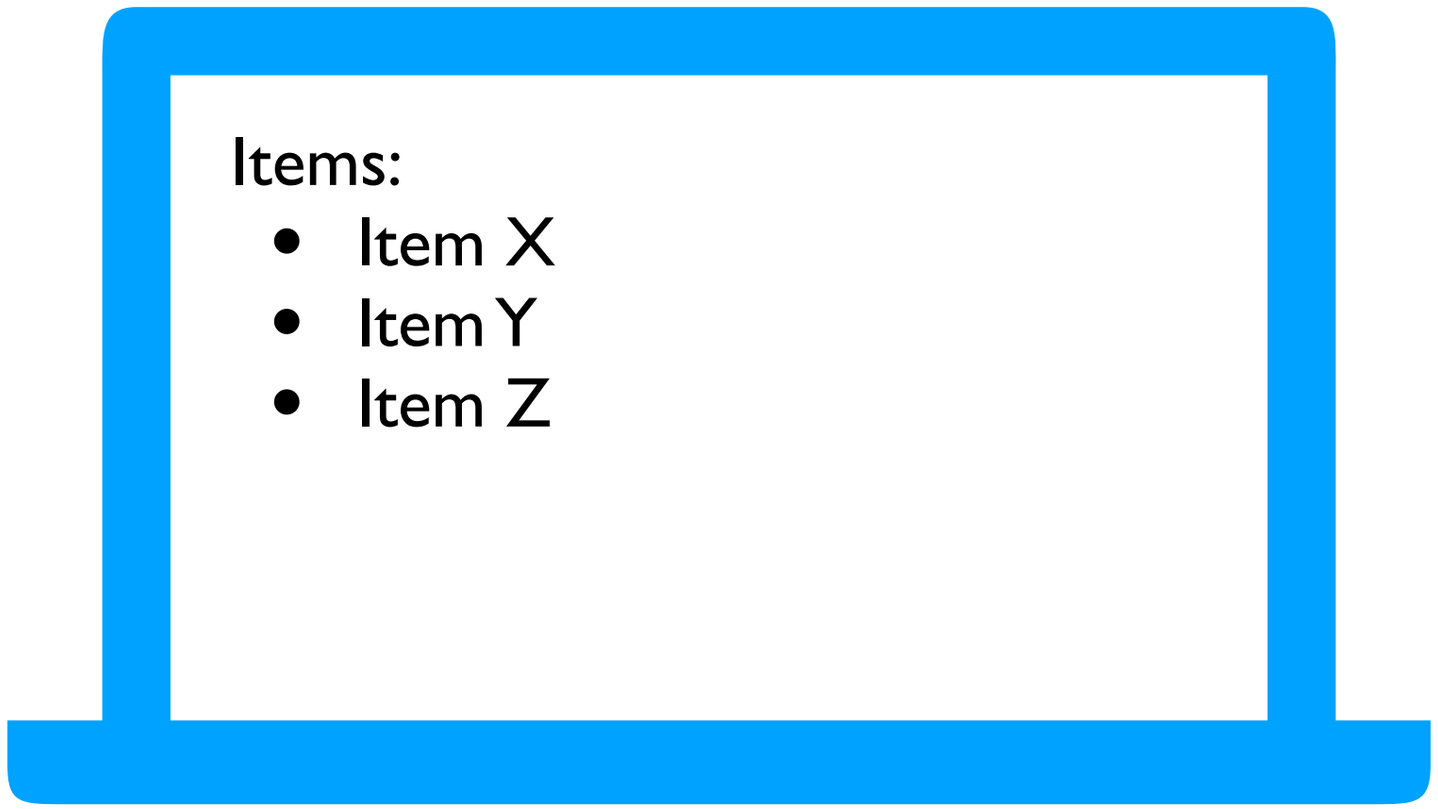


Lists

ul: unordered list
li: list item

test.html

```
Items:
<ul>
    <li>Item X</li>
    <li>Item Y</li>
    <li>Item Z</li>
</ul>
```



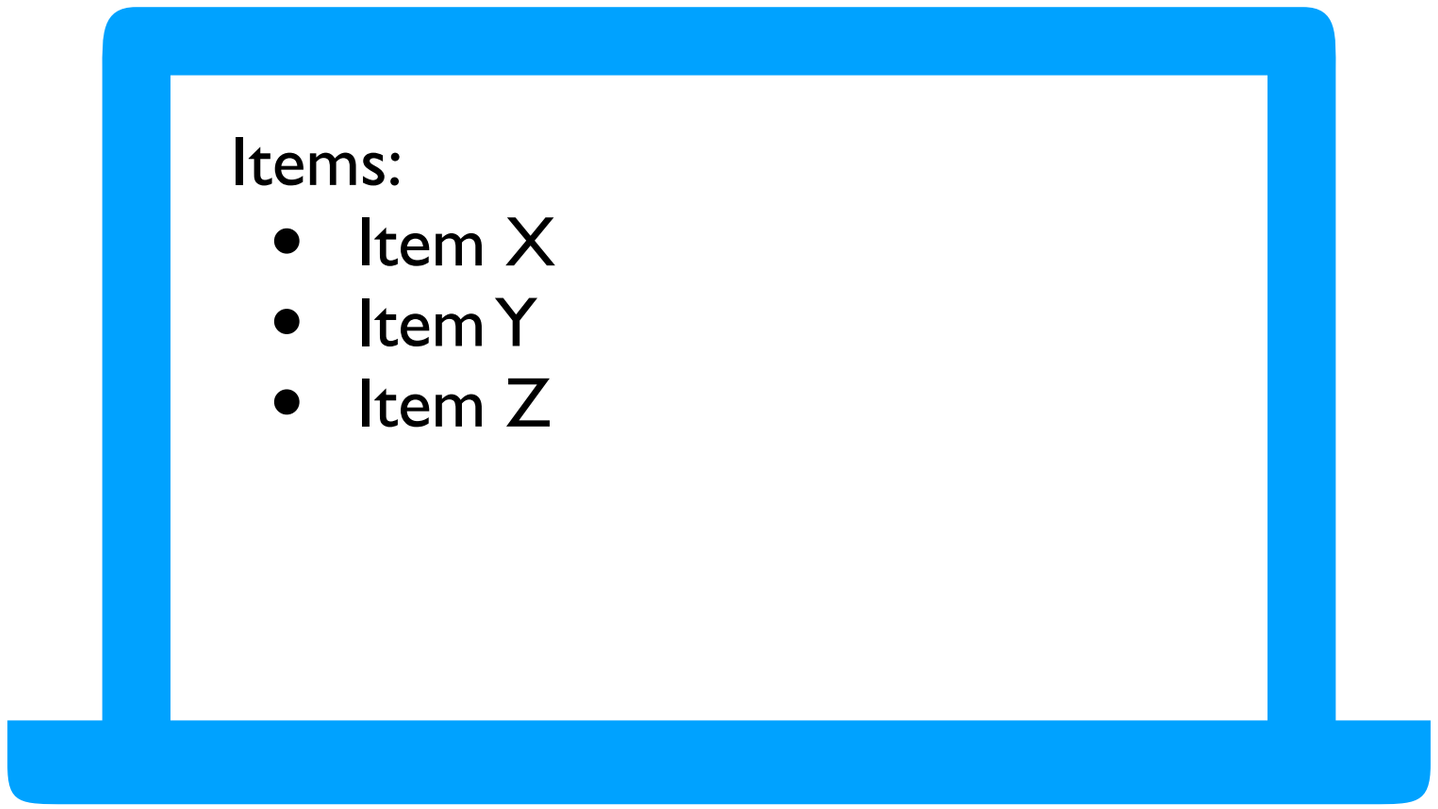
Lists

ul: unordered list
li: list item

test.html

```
Items:
<ul>
   <li>Item X
   <li>Item Y
   <li>Item Z
</ul>
```

closing tags are optional for list items



Demo 1: List Visualization

Goal: convert Python list to bulleted list in HTML

Input:

- arguments on command line

Output:

- HTML file with bulleted list

Example:

python bullets.py apple broccoli cabbage

Items:

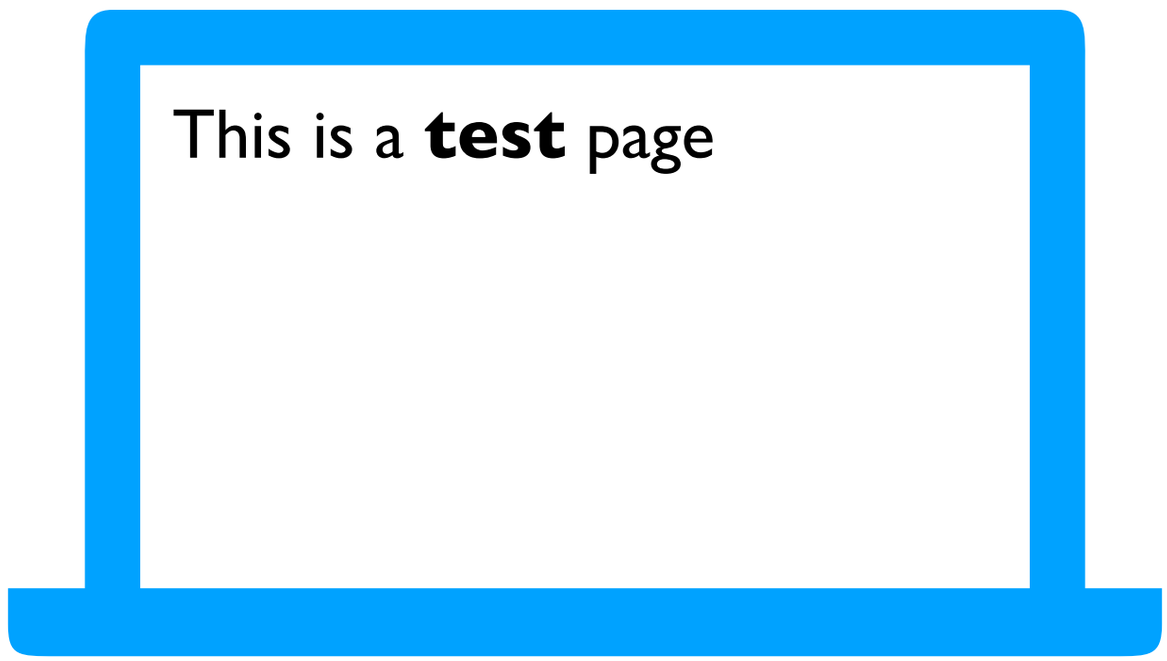
- apple
- broccoli
- cabbage

Complete Web Page

whole page is usually
in html and body tags

test.html

```
This is a <b>test</b> page
```

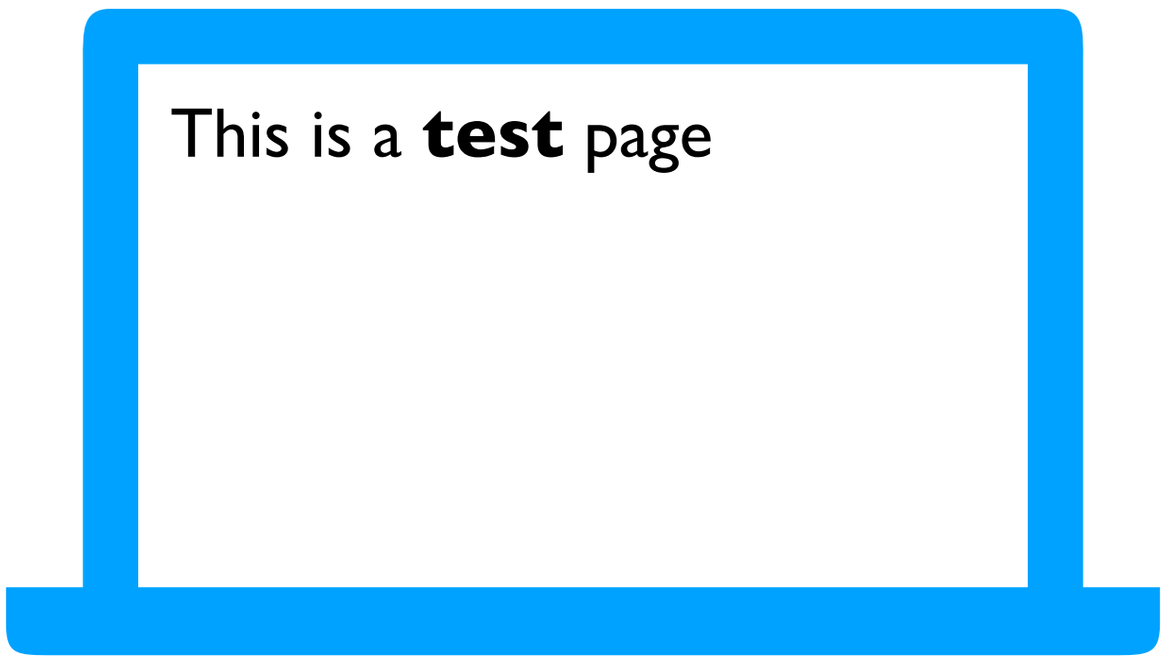


Complete Web Page

whole page is usually
in html and body tags

test.html

```
<html>
  <body>
    This is a <b>test</b> page
  </body>
</html>
```



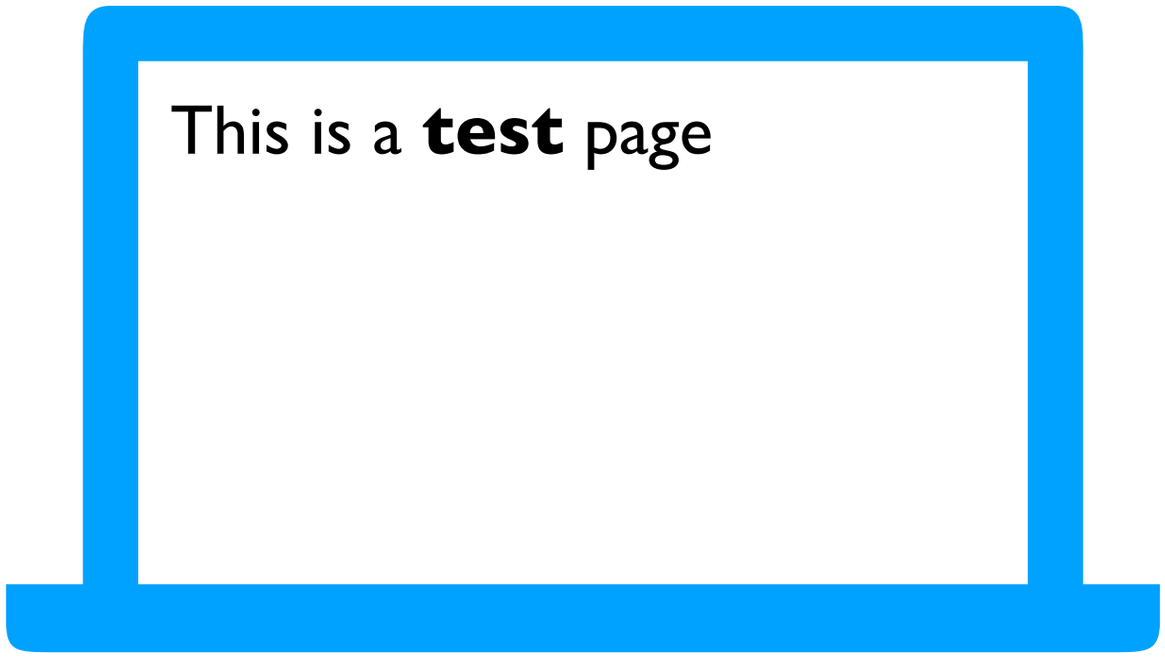
Complete Web Page

you can also have a head tag with various metadata (e.g., title, keywords)

test.html

```
<html>
  <head>

  </head>
  <body>
    This is a <b>test</b> page
  </body>
</html>
```

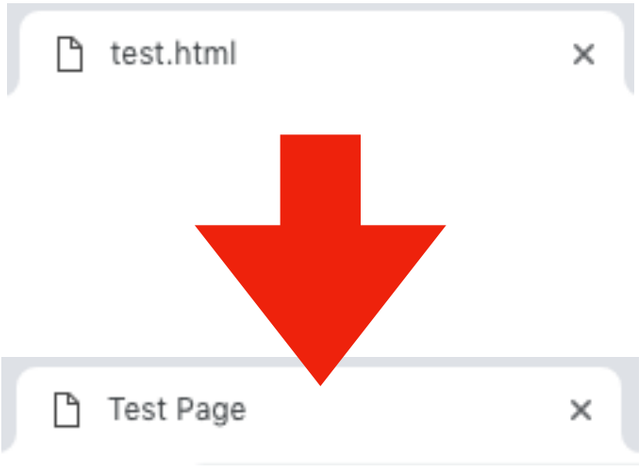


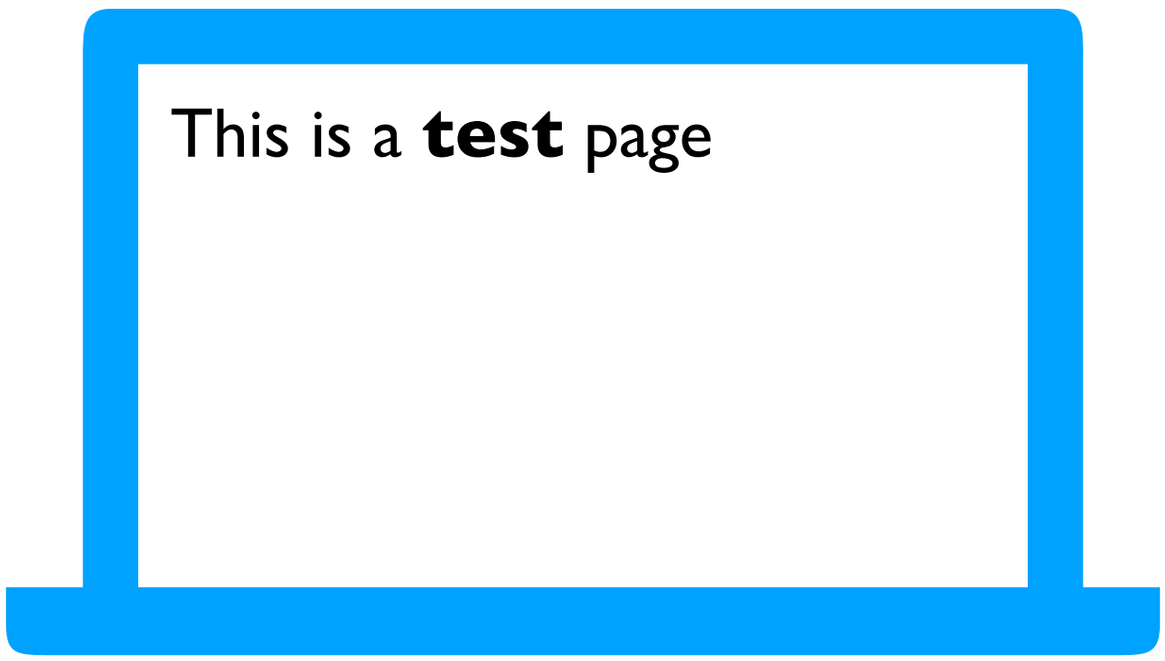
Complete Web Page

you can also have a head tag with various metadata (e.g., title, keywords)

test.html

```
<html>
  <head>
    <title>Test Page</title>
  </head>
  <body>
    This is a <b>test</b> page
  </body>
</html>
```





Outline

Hypertext

Tag Syntax

Hyperlinks and Attributes

Images

Tables

Self Learning

Hyperlinks

A.html

Welcome!
Please visit page B

B.html

You're on page B.

Welcome!
Please visit page B

Hyperlinks

we want this to be clickable

- use <a> tag

A.html

```
Welcome!<br>
Please visit <a>page B</a>
```

B.html

```
You're on page B.
```

Hyperlinks

we want this to be clickable

- use <a> tag

A.html

Welcome!
Please visit <a>page B

where does it go to?

B.html

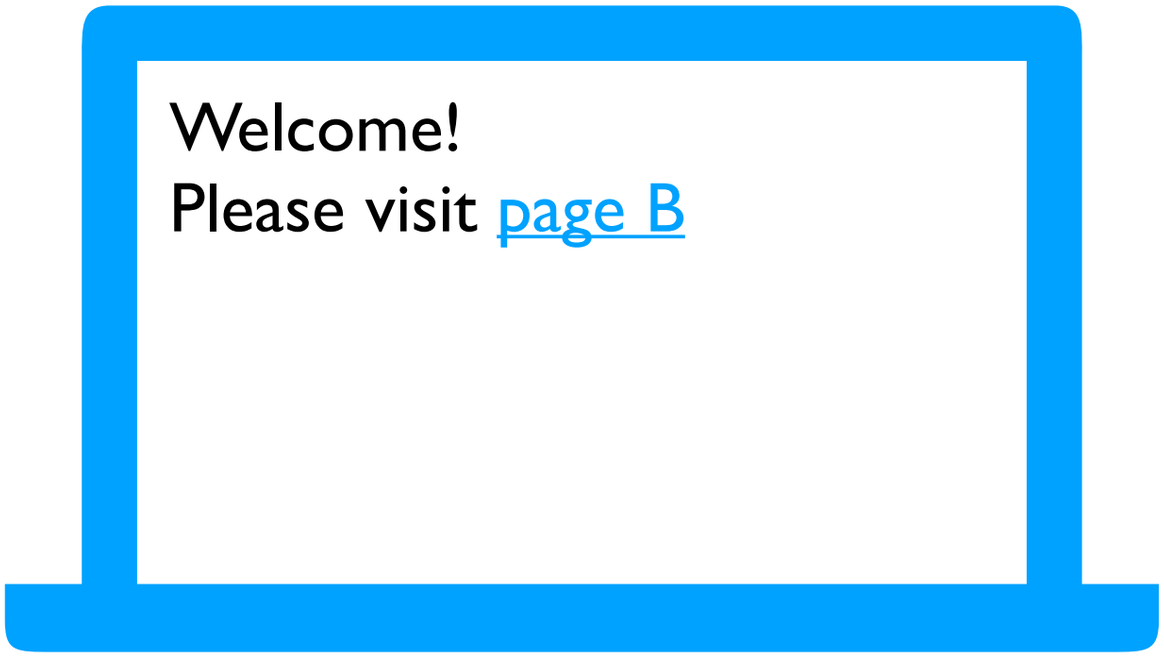
You're on page B.

Hyperlinks

we want this to be clickable

- use <a> tag
- use href attribute

inside an opening tag, we often
set parameters by using this:
`attribute-name="attribute-value"`



A.html

```
Welcome!<br>
Please visit
<a href="B.html">page B</a>
```

B.html

You're on page B.

Hyperlinks

we want this to be clickable

- use <a> tag
- use href attribute

inside an opening tag, we often
set parameters by using this:
`attribute-name="attribute-value"`

A.html

```
Welcome!<br>
Please visit
<a href="B.html">page B</a>
```

B.html

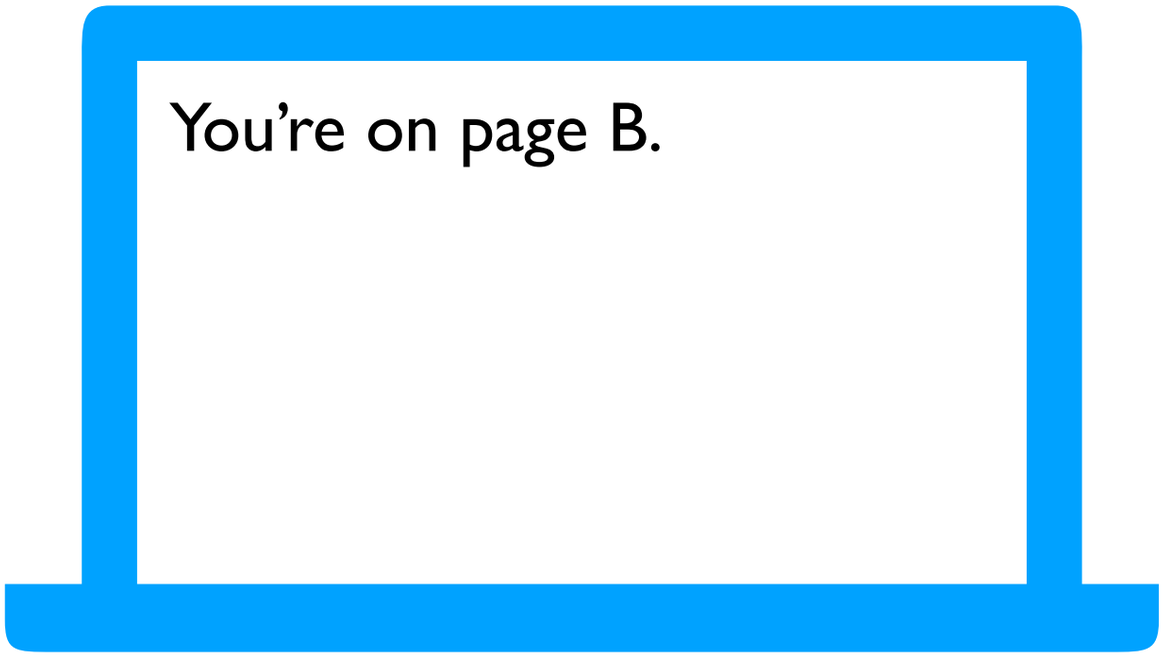
You're on page B.

Hyperlinks

we want this to be clickable

- use <a> tag
- use href attribute

inside an opening tag, we often
set parameters by using this:
`attribute-name="attribute-value"`



A.html

```
Welcome!<br>
Please visit
<a href="B.html">page B</a>
```

B.html

You're on page B.

Demo 2: Dictionary Visualization

Goal: generate HTML page for every dictionary value and have a keys.html page that links to each of them

Input:

- a string containing a JSON dictionary

Output:

- a keys.html file and an HTML file for each value

Example:

python dict-vis.py '{"A":"val 1","B","val 2"}'

keys.html

Keys:

- A
- B

A.html

val 1

B.html

val 2

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Images

img: image

test.html

```
<img src="logo.png">
```

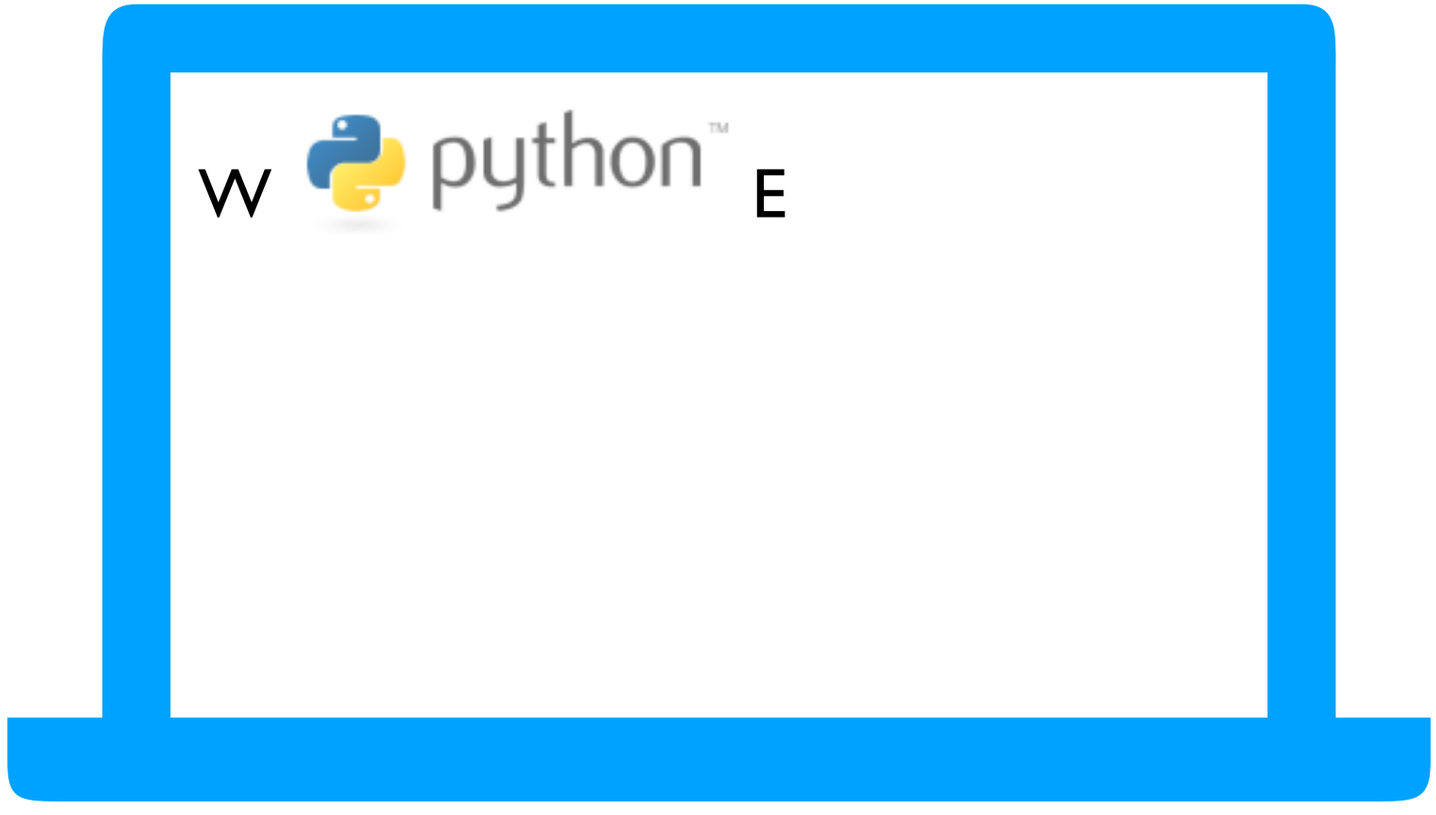
https://www.python.org/static/community_logos/python-logo.png

Images

img: image

test.html

```
W
<img src="logo.png">
E
```



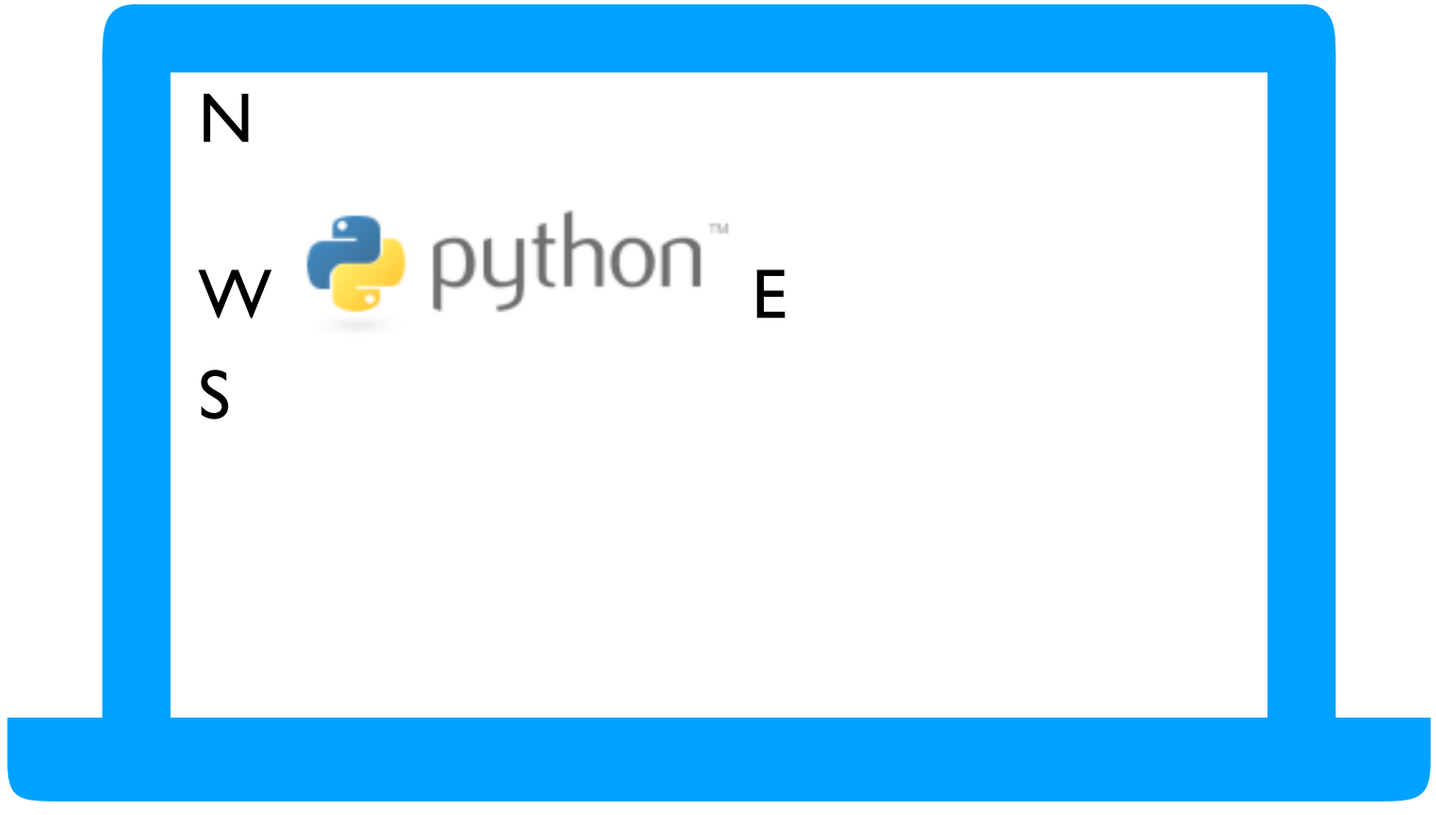
https://www.python.org/static/community_logos/python-logo.png

Images

img: image

test.html

```
N<br>
W
<img src="logo.png">
E<br>
S
```



https://www.python.org/static/community_logos/python-logo.png

Images

img: image

test.html

```
N<br>
W
<img src="logo.png" width="300">
E<br>
S
```

https://www.python.org/static/community_logos/python-logo.png

Images

img: image

test.html

```
N<br>
W
<img src="logo.png" border="1">
E<br>
S
```

https://www.python.org/static/community_logos/python-logo.png

Images

img: image

test.html

```
N<br>
W
<img src="logo.png" border="5">
E<br>
S
```

https://www.python.org/static/community_logos/python-logo.png

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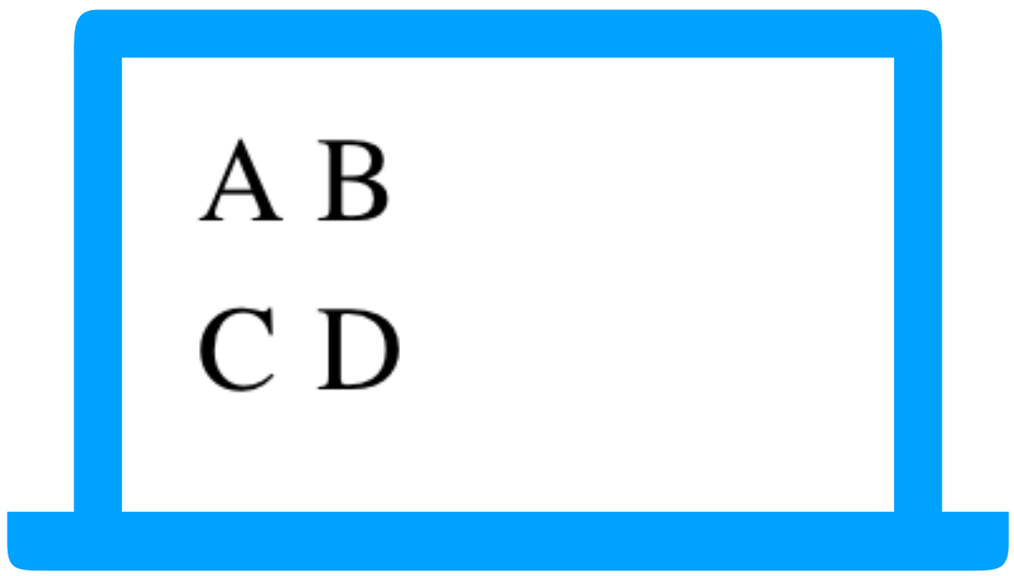
Tables

table: a table
tr: table row
td: table data (cell)

test.html

```
<table>
  <tr>
    <td>A</td>
    <td>B</td>
  </tr>
  <tr>
    <td>C</td>
    <td>D</td>
  </tr>
</table>
```

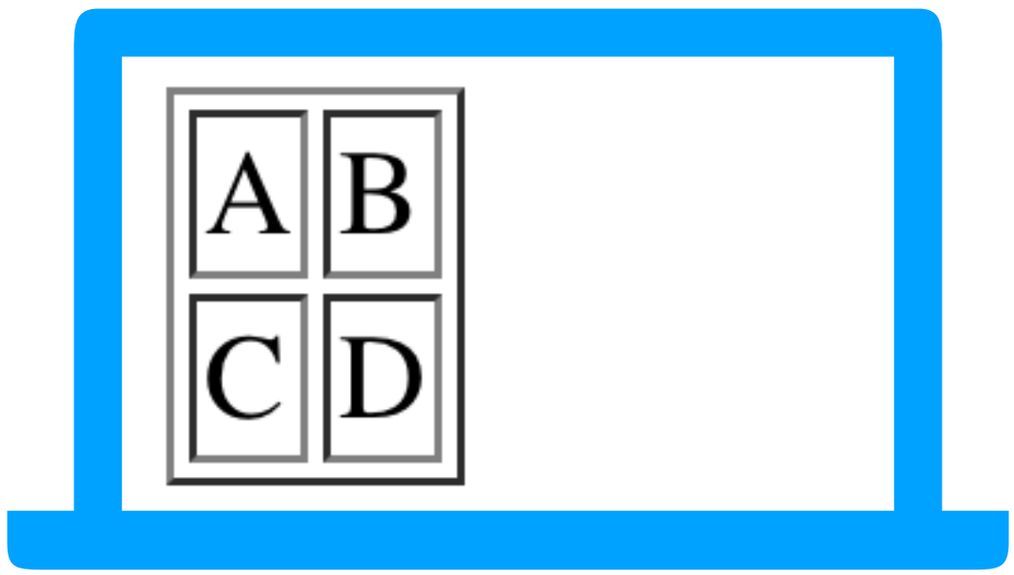


Tables

table: a table
tr: table row
td: table data (cell)

test.html

```
<table border="1">
  <tr>
    <td>A</td>
    <td>B</td>
  </tr>
  <tr>
    <td>C</td>
    <td>D</td>
  </tr>
</table>
```

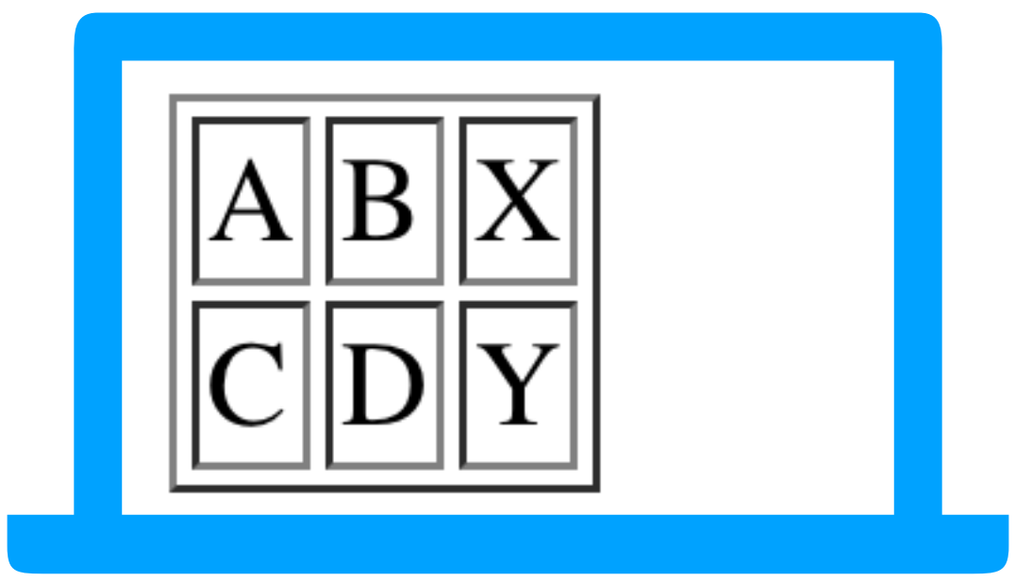


Tables

table: a table
tr: table row
td: table data (cell)

test.html

```
<table border="1">
 <tr>
  <td>A</td>
  <td>B</td>
  <td>X</td>
 </tr>
 <tr>
  <td>C</td>
  <td>D</td>
  <td>Y</td>
 </tr>
</table>
```

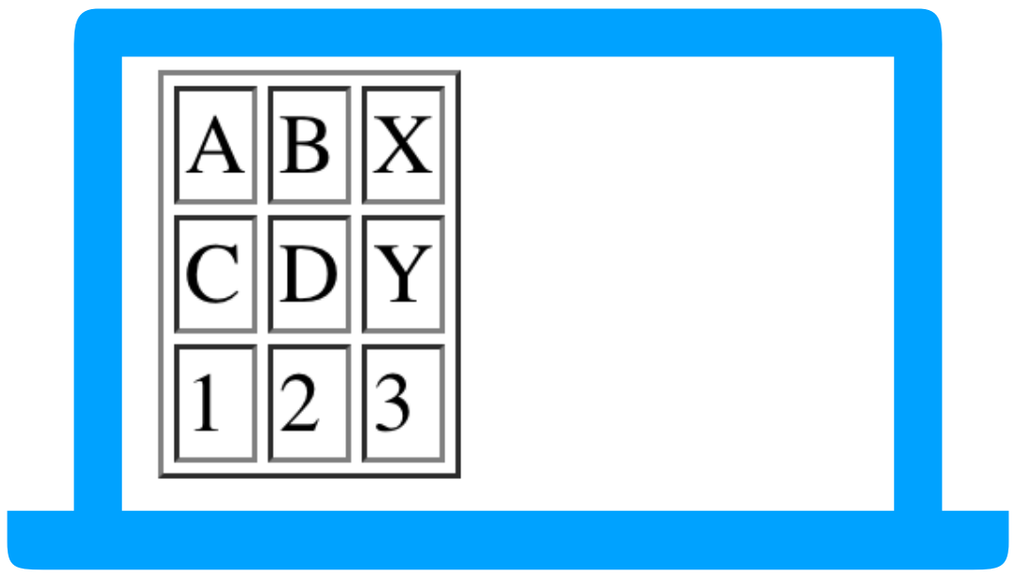


Tables

table: a table
tr: table row
td: table data (cell)

test.html

```
<table border="1">
 <tr>
  <td>A</td>
  <td>B</td>
  <td>X</td>
 </tr>
 <tr>
  <td>C</td>
  <td>D</td>
  <td>Y</td>
 </tr>
 <tr><td>1</td><td>2</td><td>3</td></tr>
</table>
```



Demo 3: DataFrame to HTML Table

Goal: convert a DataFrame to an HTML Table
(note, you can do this more simply, but it's good practice)

Input:

- a Pandas DataFrame

Output:

- an HTML file

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Resources for Self Learning

There are many free online resources (e.g., w3schools) if you want to learn more about web development

More **HTML**

- https://www.w3schools.com/html/default.asp
- More of what we learned today

CSS (Cascading Style Sheets)

- https://www.w3schools.com/css/default.asp
- Control the aesthetics of your HTML with the CSS language

JavaScript

- https://www.w3schools.com/js/default.asp
- Full programming language (like Python) for running code in a user's web browser