[220] Web 2

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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

index.html (common home page name)

Two steps for dealing with Hypertext:
1. how to retrieve hypertext
2. how to display hypertext

Welcome to the home page!

Please visit the other pages:
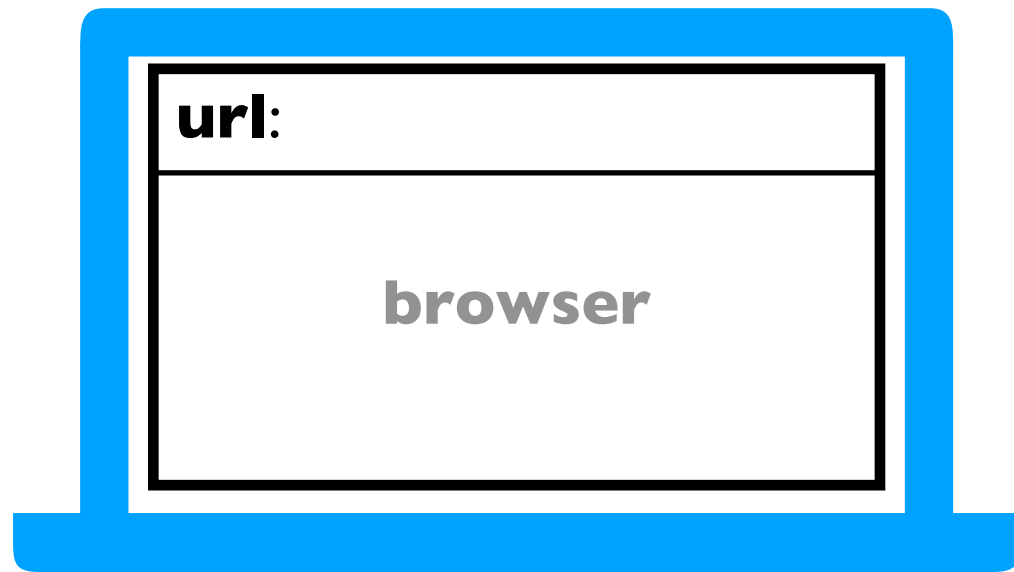- **about**
- **contact**

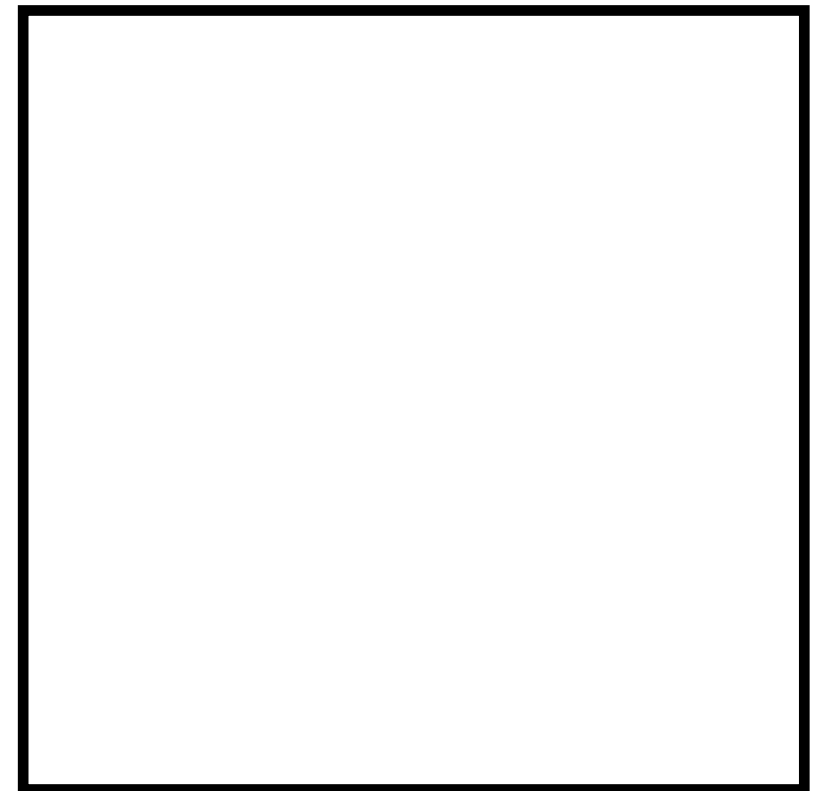contact.html

Contact Us

Email: ms@cs.wisc.edu

Phone: 123-456-7890

Hypertext is text with clickable links to other pages

Hypertext

url:

browser

computer 1

computer 2

Hypertext
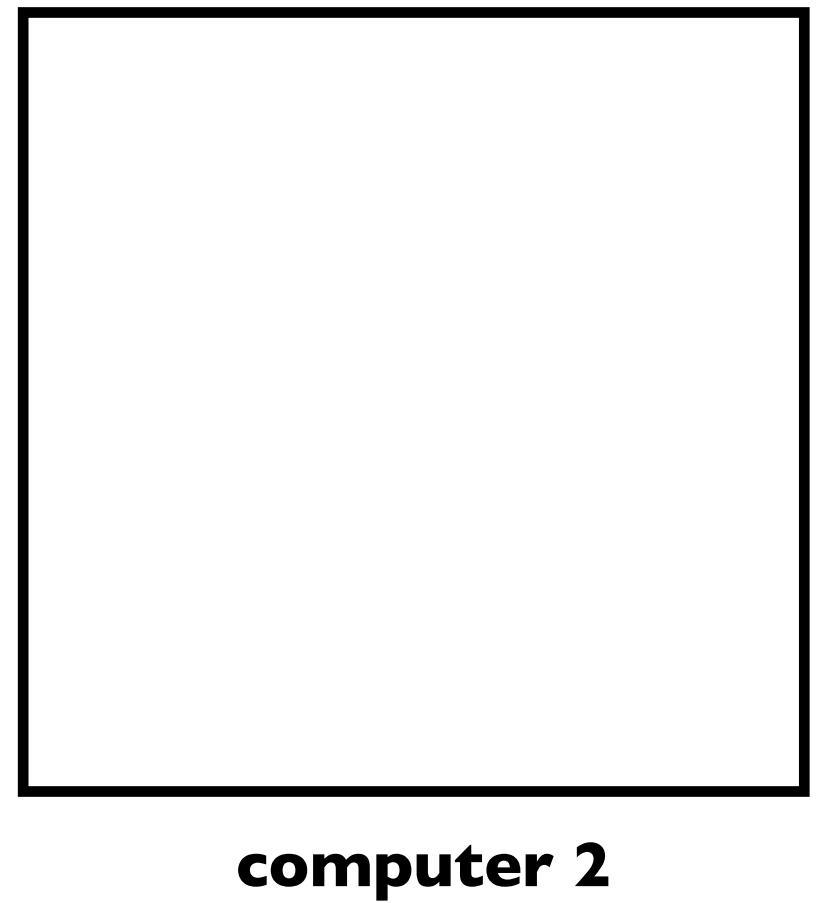

url: http://domain/rsrc.html **GO!**

browser

computer 1

computer 2

Hypertext

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

url: http://domain/rsrc.html

browser

computer 1

HTTP Request

computer 2
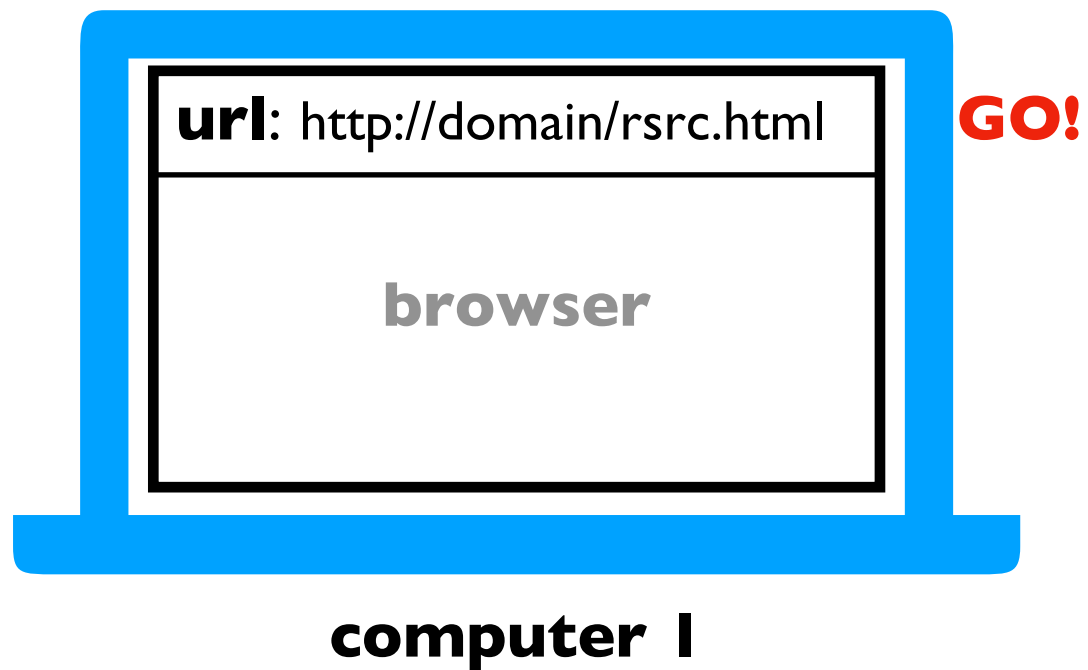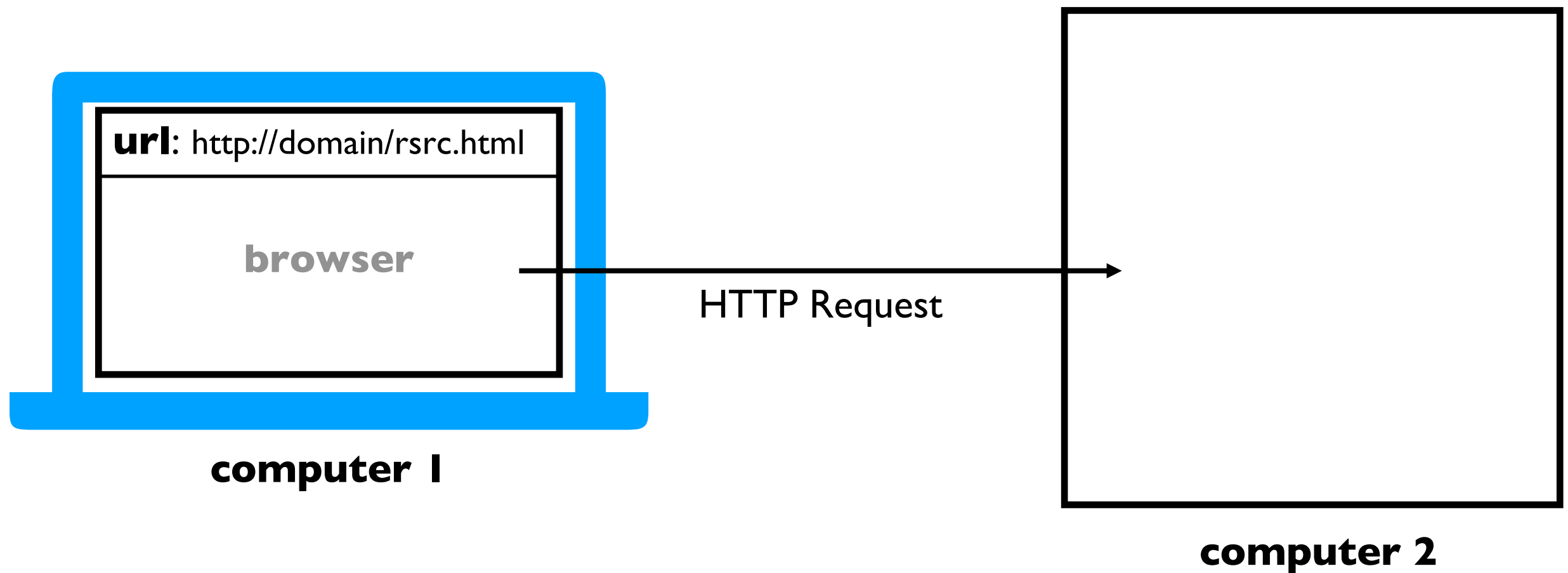
HTTP Request:
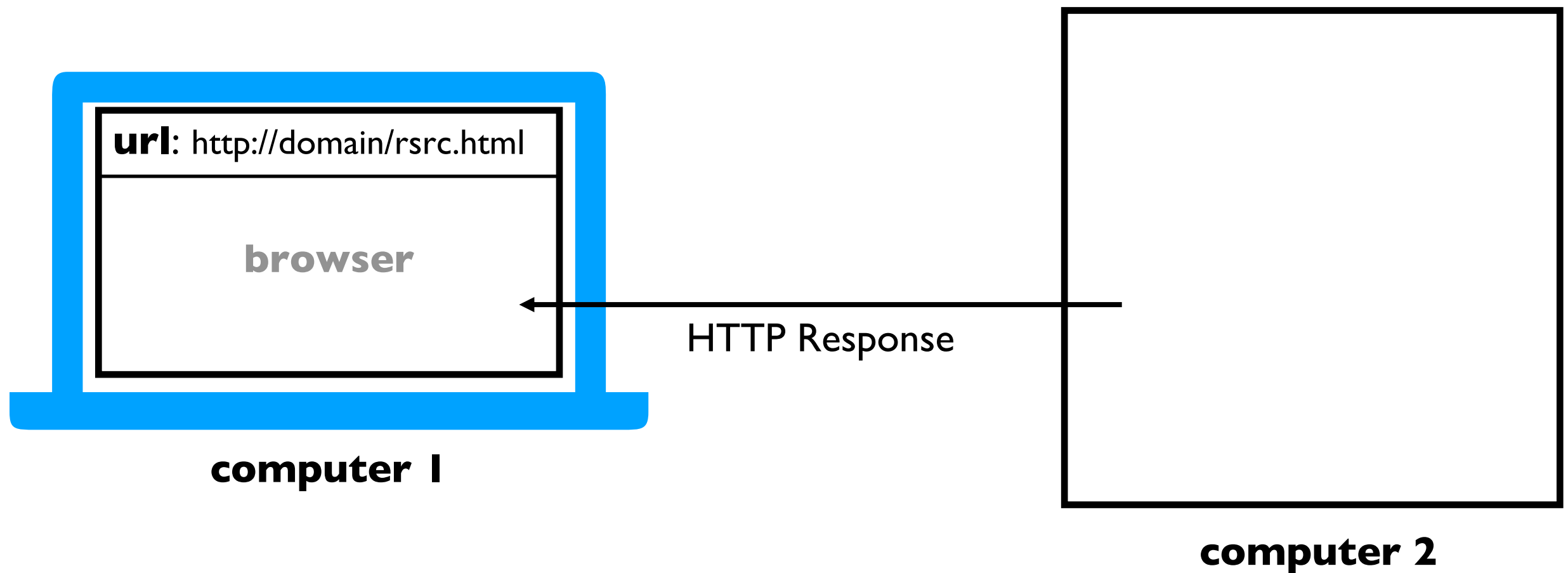
```
GET /rsrc.html HTTP/1.1
Host: example.com
User-Agent: ...
Accept: */*
```

Hypertext

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

url: http://domain/rsrc.html

browser

HTTP Response

computer 1

computer 2

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

url: http://domain/rsrc.html

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

computer 1

HTTP Response

computer 2

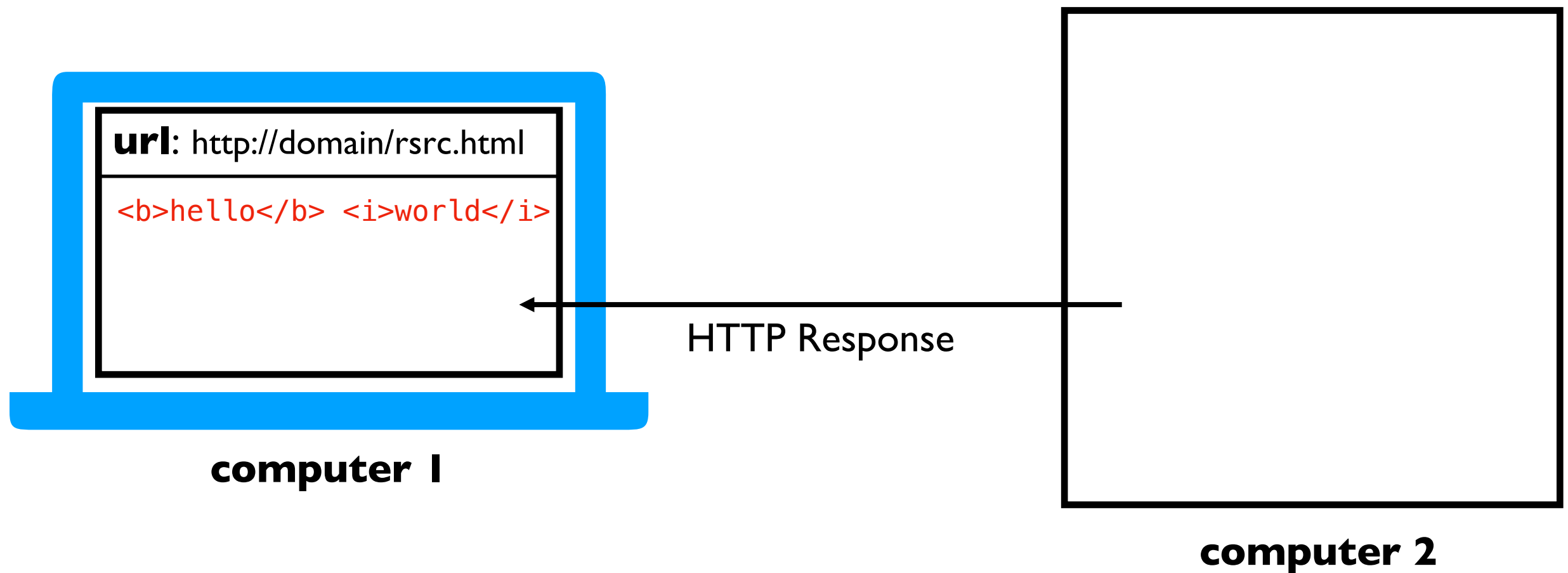**HTTP Response:**

```
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

url: http://domain/rsrc.html

hello <i>world</i>

computer 1

HTTP Response

computer 2

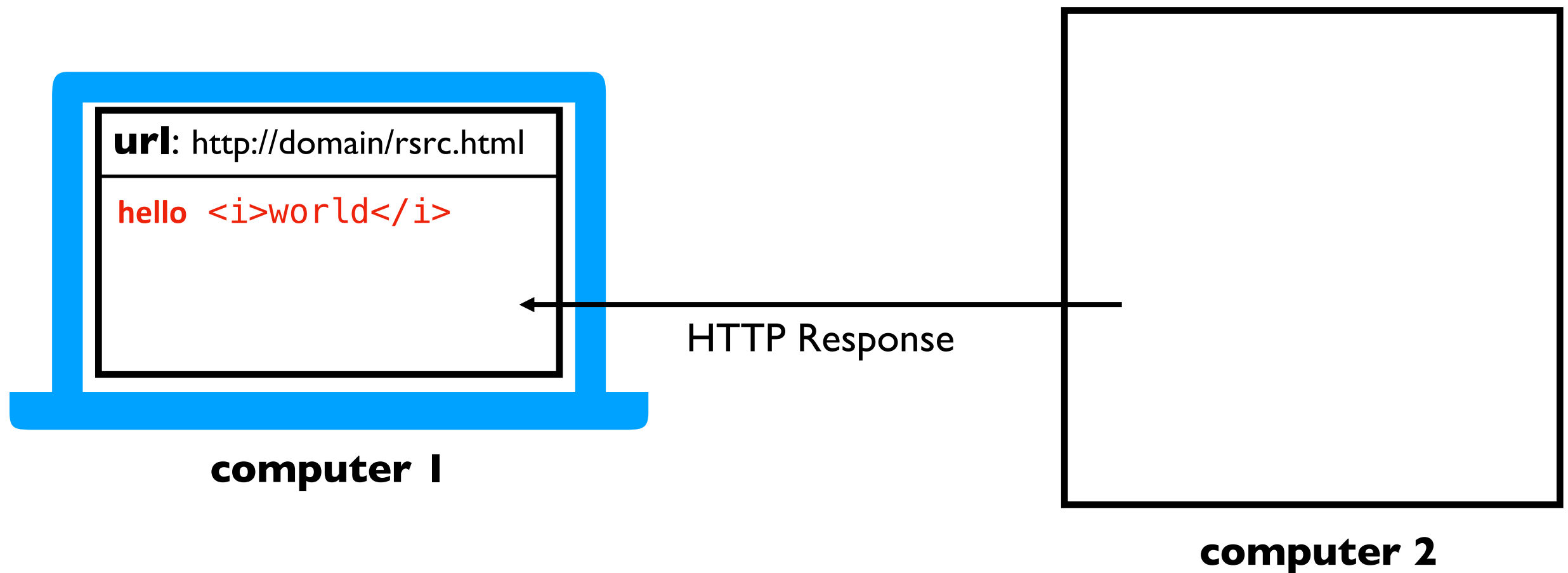**HTTP Response:**
```
HTTP/1.0 200 OK
Content-Type: text/html; charset=utf-8
Content-Length: 74

<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

url: http://domain/rsrc.html

hello *world*

computer 1

HTTP Response
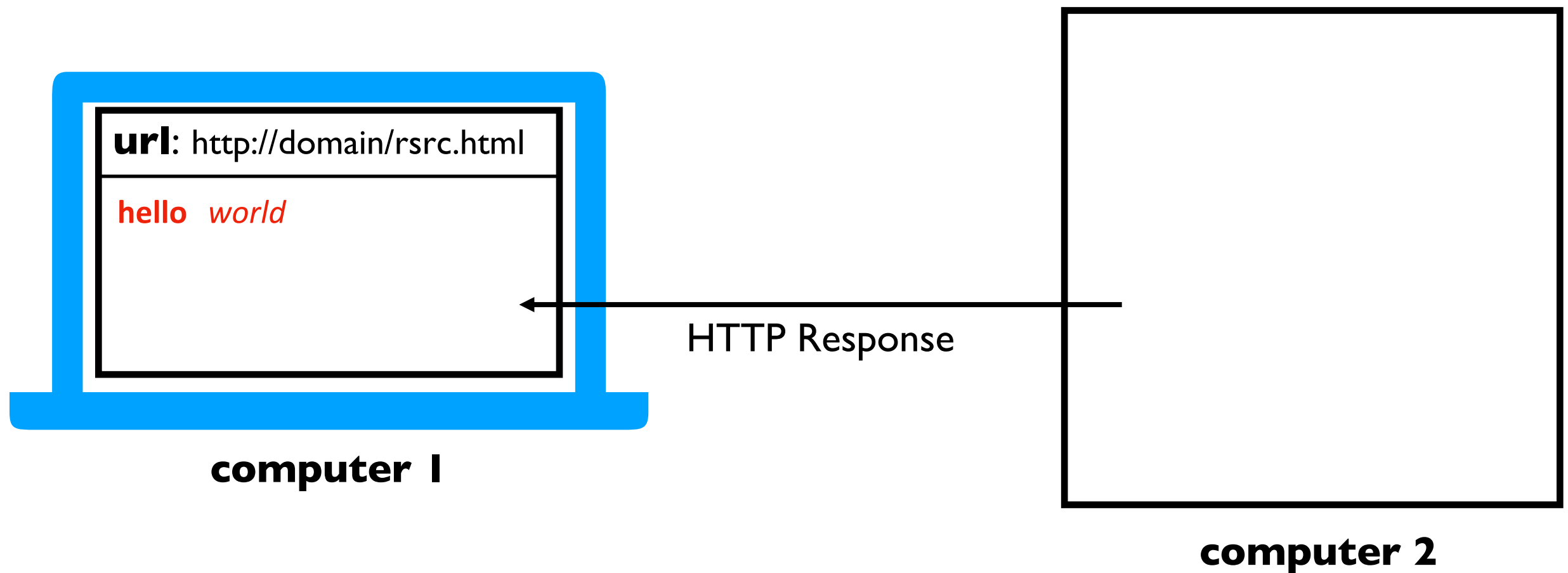
computer 2

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

url: http://domain/rsrc.html
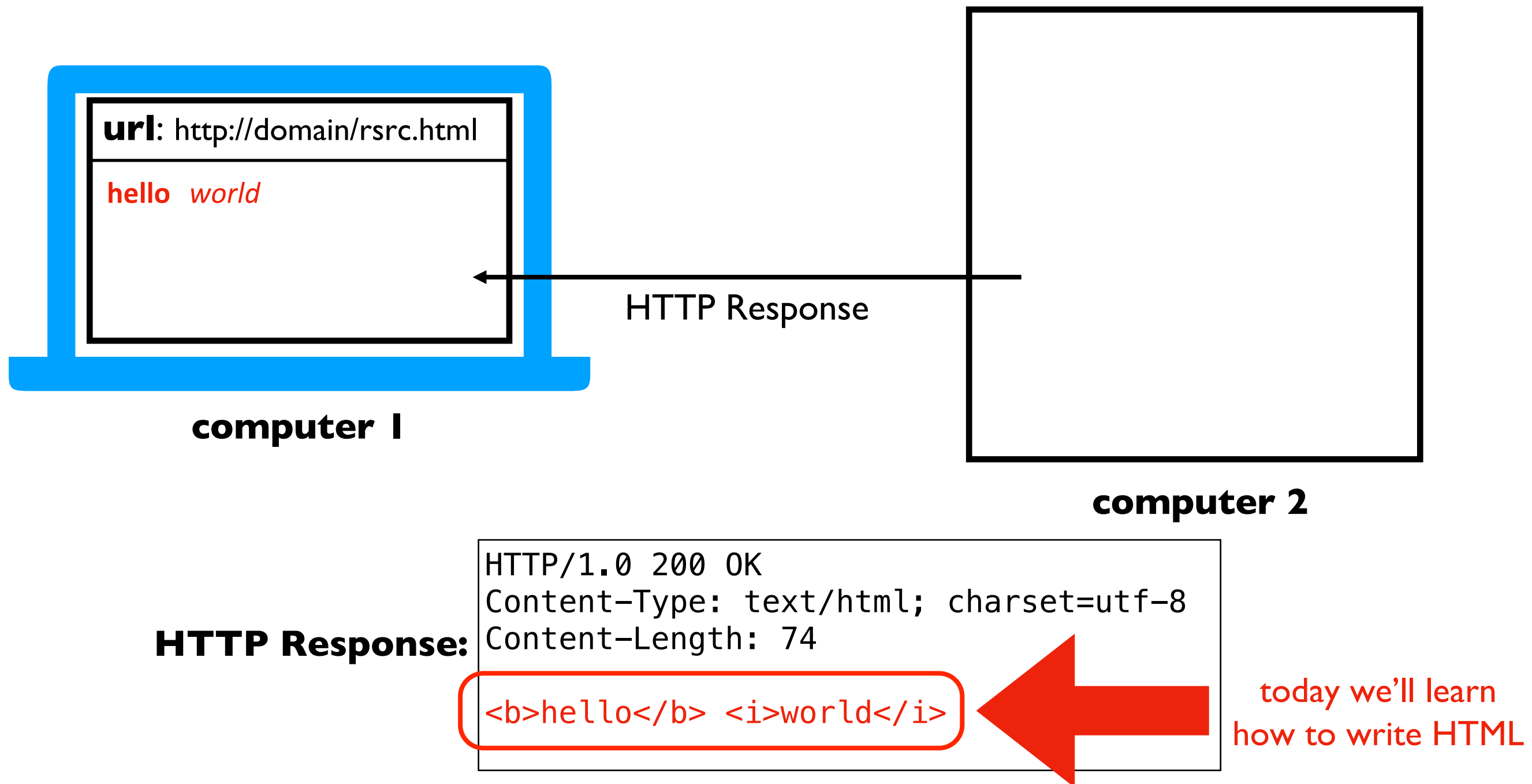
hello *world*

HTTP Response

computer 1

computer 2

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://www.msyamkumar.com/hello.txt

https://www.msyamkumar.com/hello.html

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

Outline

Hypertext

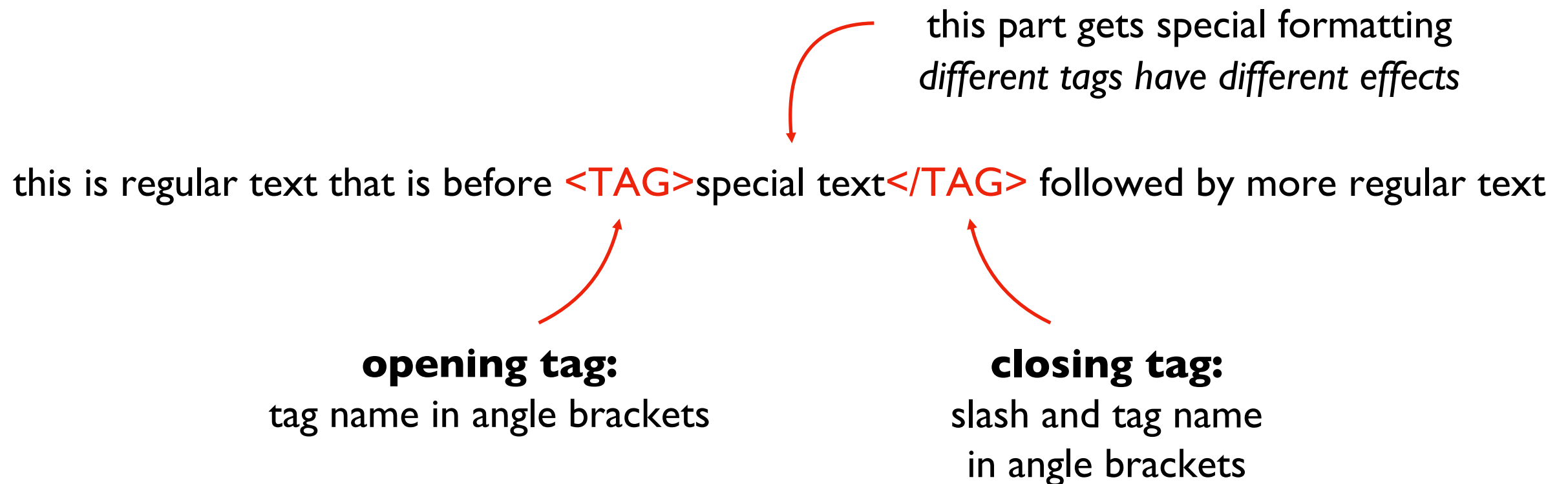Tag Syntax

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

This is a test page

Simple Tags - bold

b: bold

test.html

This is a test page

This is a **test** page

Simple Tags - bold

b: bold

test.html

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

This is a **test page**

Simple Tags - italic

i: italic

test.html

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

This is a *test page*

Simple Tags - italic

i: italic

test.html

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

This is a *test page*

Simple Tags – italic & bold
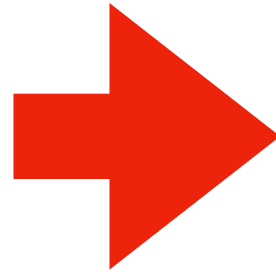
i: italic

test.html

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

This is a *test page*

Vertical Space

whitespace in
html is ignored

test.html

This is a test page.

It is awesome.

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>
```

This is a test page.

It is awesome.

Vertical Space

br: line break

test.html

This is a test page.
\<br\>
It is awesome.

This is a test page.
It is awesome.

Vertical Space

br: line break

This is a test page.
**

**
It is awesome.

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)

This is a test page.

It is awesome.

Vertical Space

br: line break

test.html

This is a test page.
**

**
It is awesome.

sometimes you'll encounter it like this

This is a test page.

It is awesome.

Header tags

h1: big header

test.html

<h1>Welcome</h1>

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

<p>It is awesome.</p>

Welcome

This is a test page.

It is awesome.

Header tags

h1: big header

h2: smaller header

test.html

<h1>Welcome</h1>

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

<p>It is awesome.</p>

Welcome

This is a test page.

It is awesome.

Header tags

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>
```

Welcome

This is a test page.

It is awesome.

Lists

ul: unordered list
li: list item

Items:
<ul>
  **
Item X
**
**
**

Items:
- Item X

Lists

ul: unordered list
li: list item

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

Items:
- Item X
- Item Y

Lists

ul: unordered list
li: list item

test.html

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

Items:
- Item X
- Item Y
- Item Z

Lists

ul: unordered list
li: list item

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

closing tags
are optional
for list items

Items:
- Item X
- Item Y
- Item Z

Demo 1: List Visualization

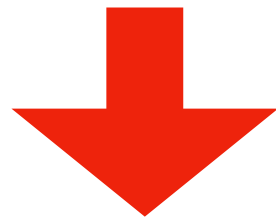Goal: convert Python list to bulleted list in HTML

Input:
- List of shopping items

Output:
- HTML file with bulleted list

Example:

python bullets.py apple broccoli cabbage

Items:
- apple
- broccoli
- cabbage

Complete Web Page

test.html

This is a test page

whole page is usually
in html and body tags

This is a **test** page

Complete Web Page

test.html

whole page is usually
in html and body tags

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

This is a **test** page

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>
```

This is a **test** page

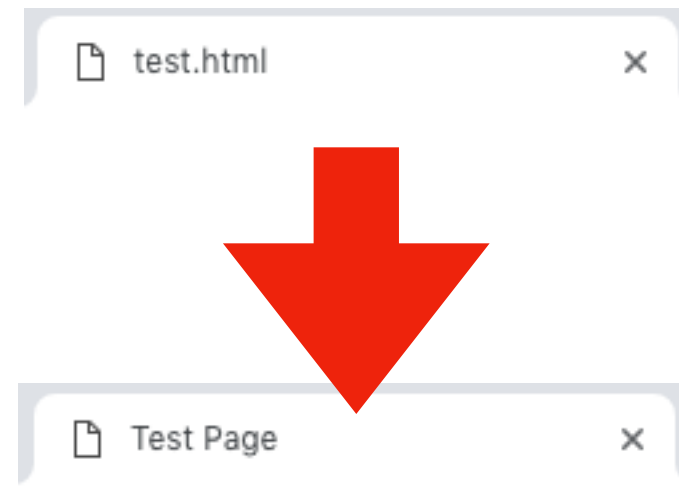# Complete Web Page

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>
```

test.html ✕

Test Page ✕

This is a **test** page

Outline

Hypertext

Tag Syntax

Hyperlinks and Attributes

Images

Tables

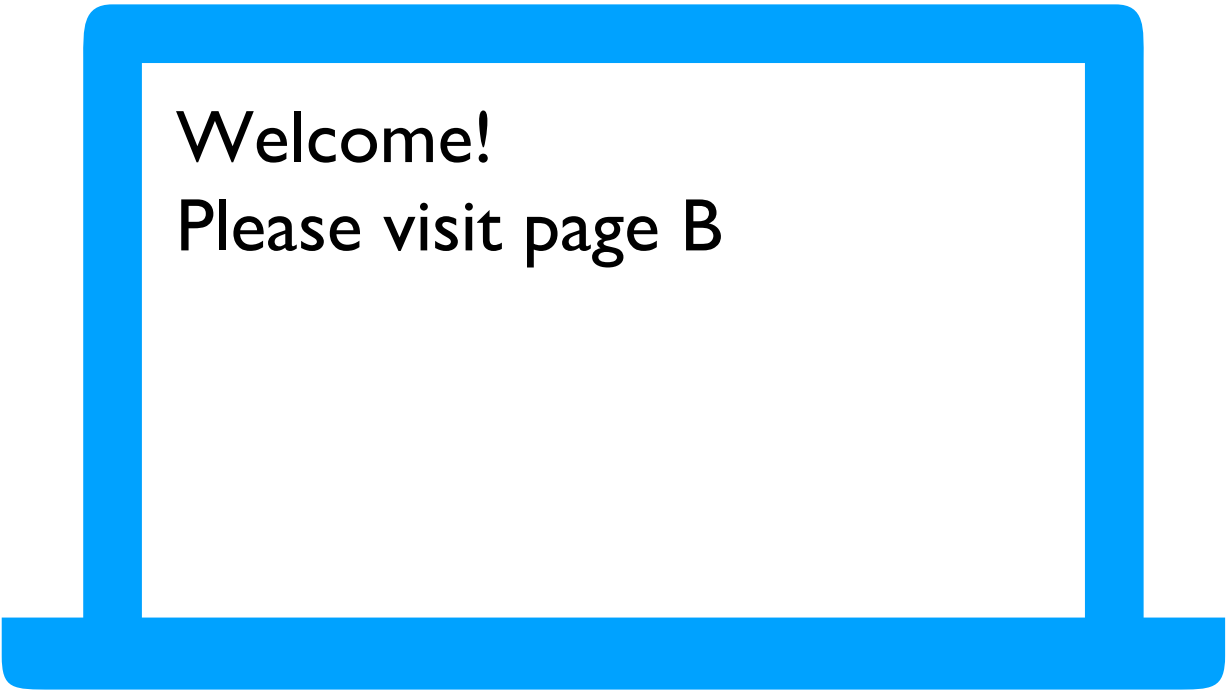Self Learning

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!
Please visit <a>page B

B.html

You're on page B.

Welcome!
Please visit page B

Hyperlinks

we want this to be clickable
- use <a> tag

Welcome!
Please visit <a>page B

where does it go to?

B.html

You're on page B.

Welcome!
Please visit 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"`

Welcome!
Please visit page B

A.html

Welcome!
Please visit
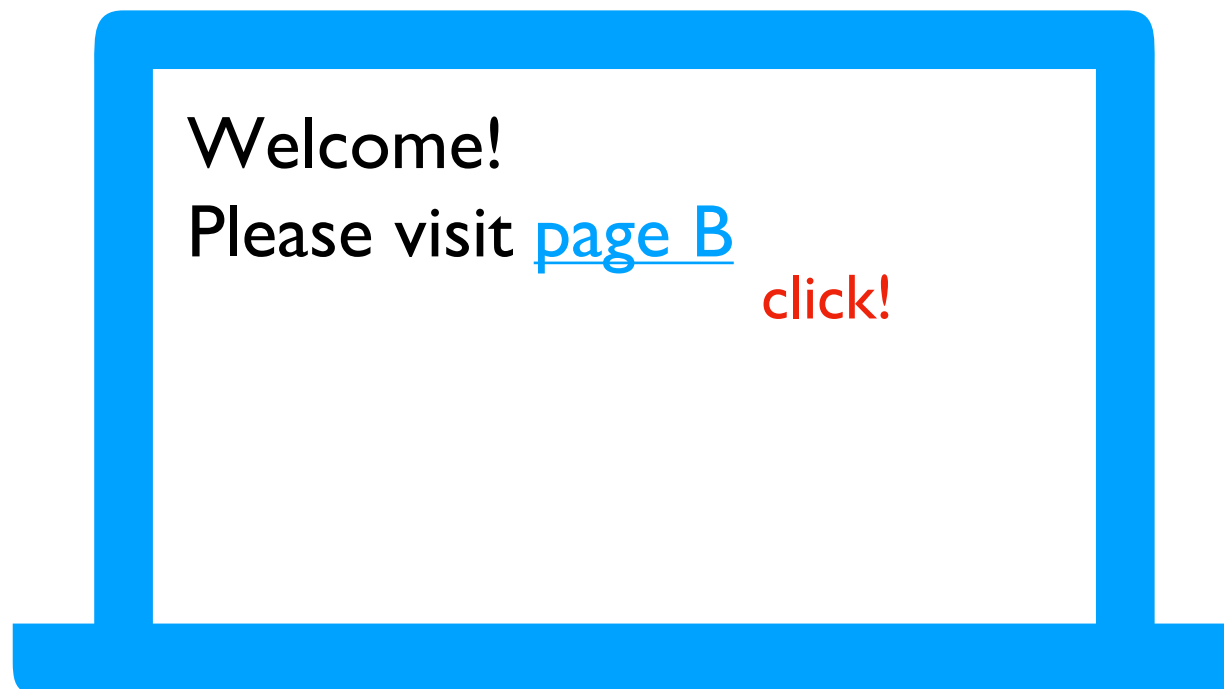page B

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!
Please visit
page B

B.html

You're on page B.

Welcome!
Please visit page B

click!

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"`

You're on page B.

Welcome!
Please visit
page B

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

Outline

Hypertext

Tag Syntax

Hyperlinks and Attributes

Images

Tables

Self Learning

Images

img: image

test.html

<img src="logo.png">

python™

Images

img: image

test.html

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

W python E

Images

img: image

test.html

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

N

W python E

S

Images

img: image

test.html

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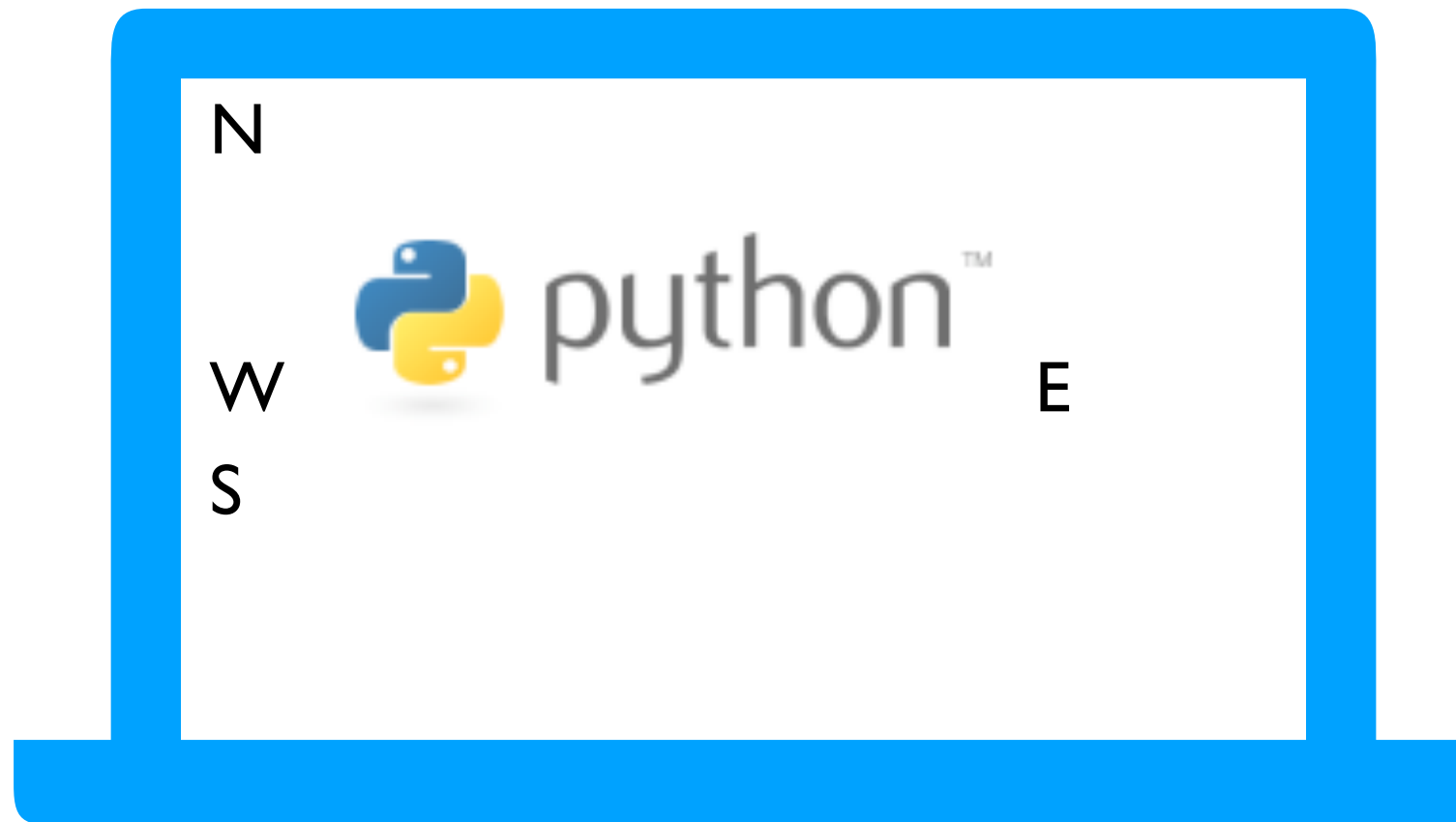

N

W   E
S

Images

img: image

test.html

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

N

W python E

S

Images

img: image

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

N

W E

S

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

Outline

Hypertext

Tag Syntax

Hyperlinks and Attributes

Images

Tables

Self Learning

Tables

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

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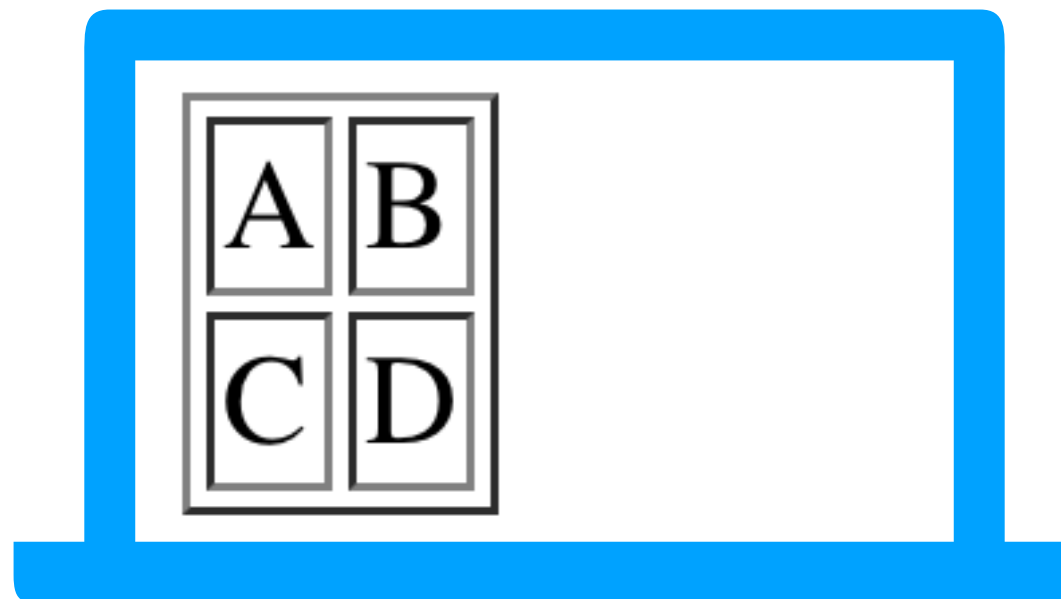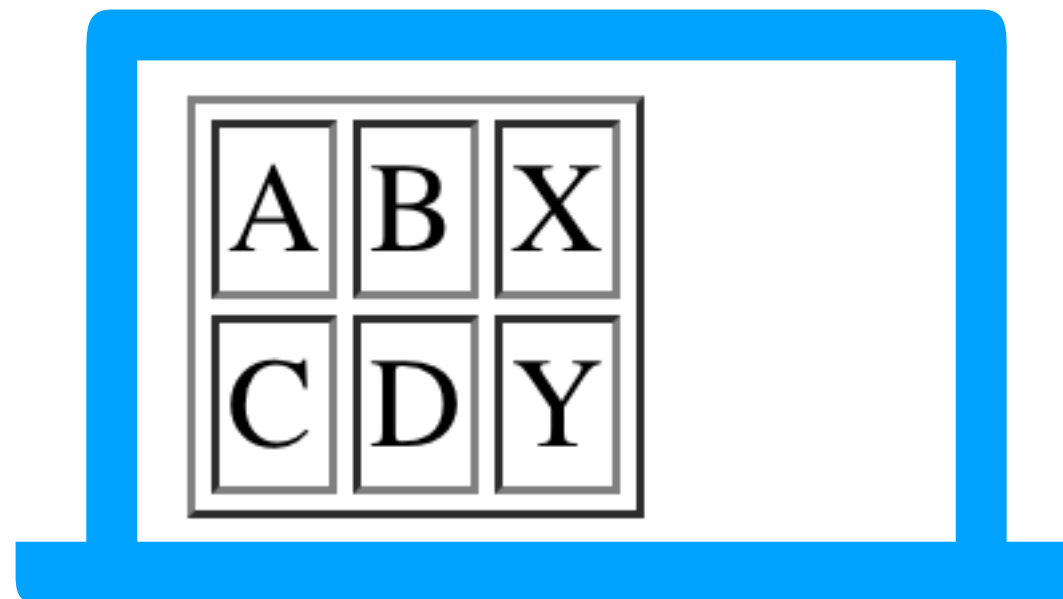
A B
C D

Tables

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

```
<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)

```
<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

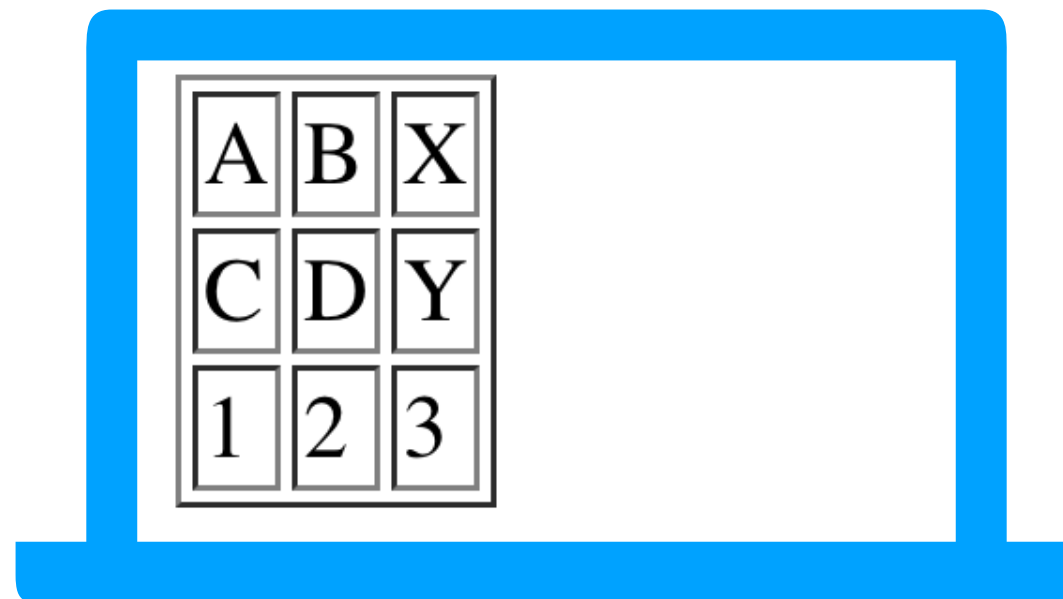**table**: a table

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>
```

A	B	X
C	D	Y
1	2	3

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

Other Demos (time permitting)

Demo 4: Table Diff
- convert two similar DataFrames to HTML tables, highlighting the differing cells with bold text

Demo 5: Search Highlighting
- Download page and convert certain words (search terms) to bold text

Demo 6: Flash Cards
- Show questions, and reveal answers when user clicks an answer hyperlink

Outline

Hypertext

Tag Syntax

Hyperlinks and Attributes

Images

Tables

Self Learning

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/html/default.asp
- Control the aesthetics of your HTML with the CSS language

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