

[301] 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)

Welcome to the home page!

Please visit the other pages:

- [about](#)
- [contact](#)

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

Hypertext

index.html (common home page name)

Welcome to the home page!

Please visit the other pages:

- [about](#)
- [contact](#)

contact.html

Contact Us

Email: tylerharter@gmail.com

Phone: 123-456-7890

Hypertext is text with clickable links to other pages

Hypertext

index.html (common home page name)

Welcome to the home page!

Please visit the other pages:

- [about](#)
- [contact](#)

Two steps for dealing with Hypertext:

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

contact.html

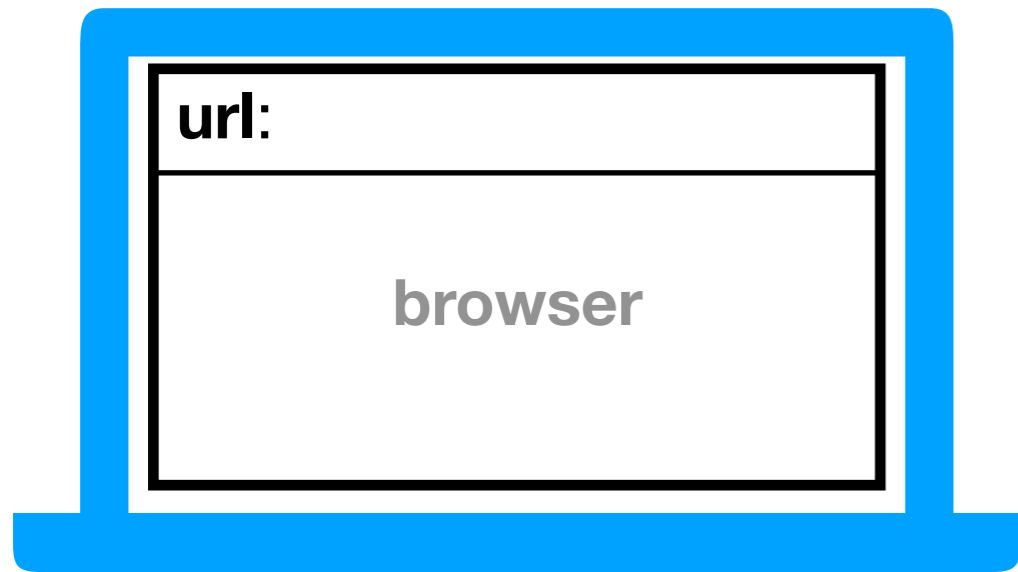
Contact Us

Email: tylerharter@gmail.com

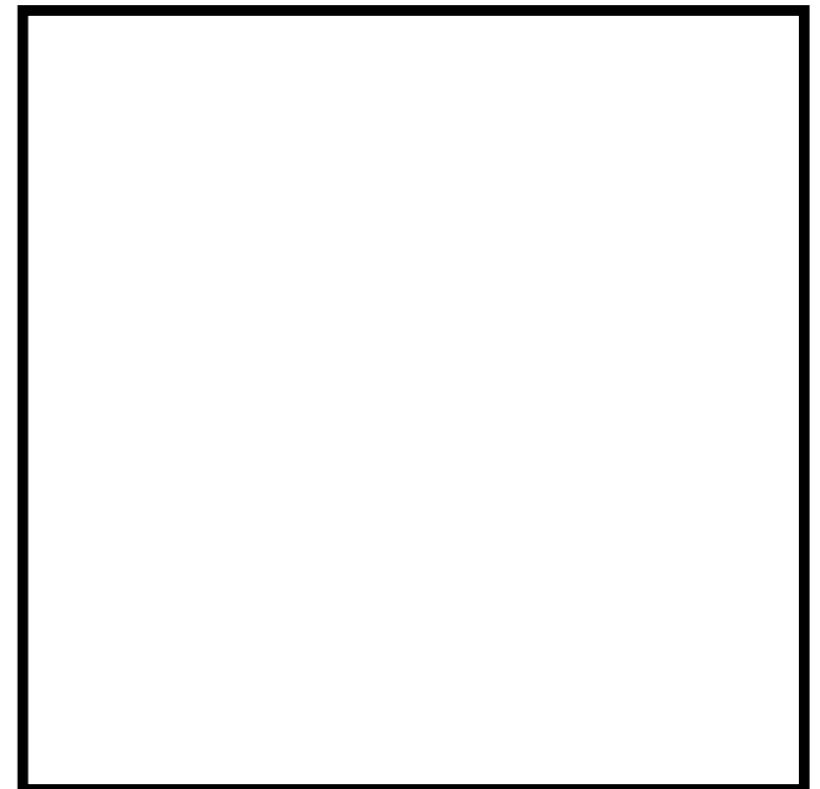
Phone: 123-456-7890

Hypertext is text with clickable links to other pages

Hypertext

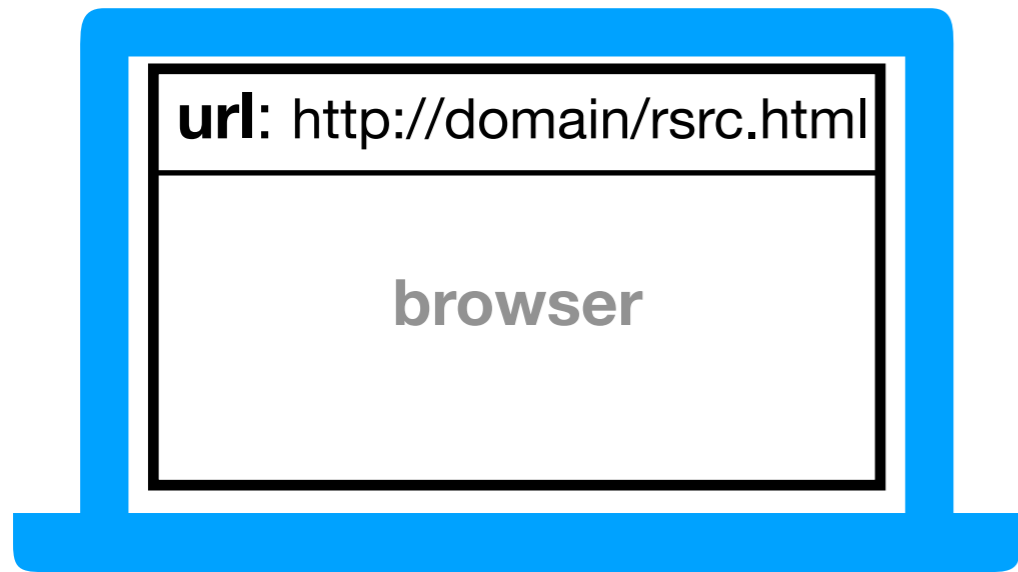


computer 1

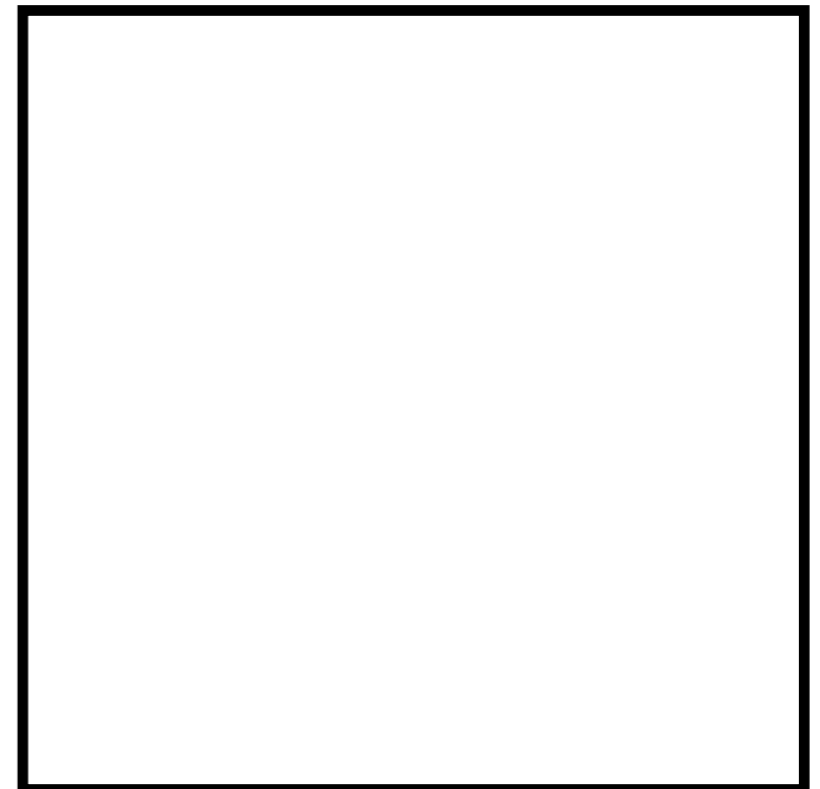


computer 2

Hypertext

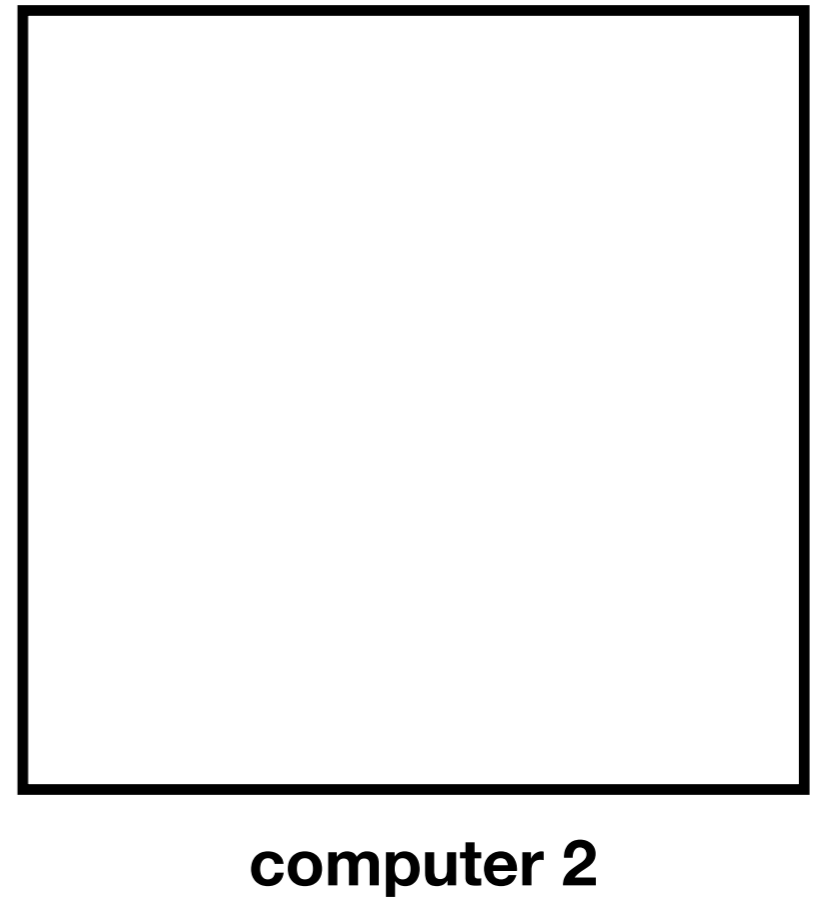
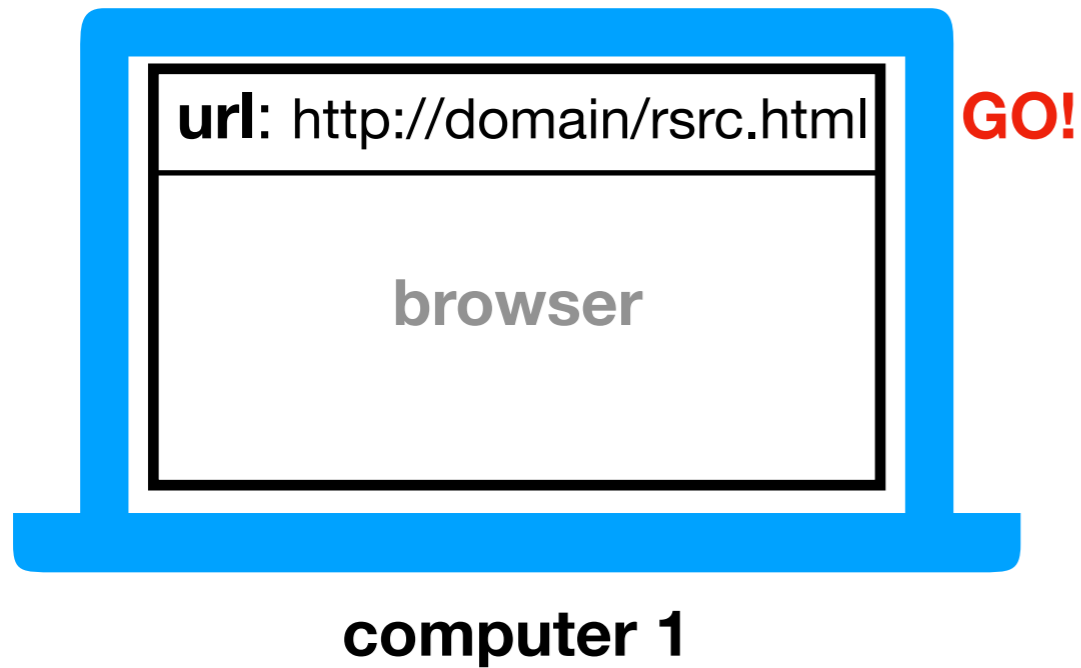


computer 1



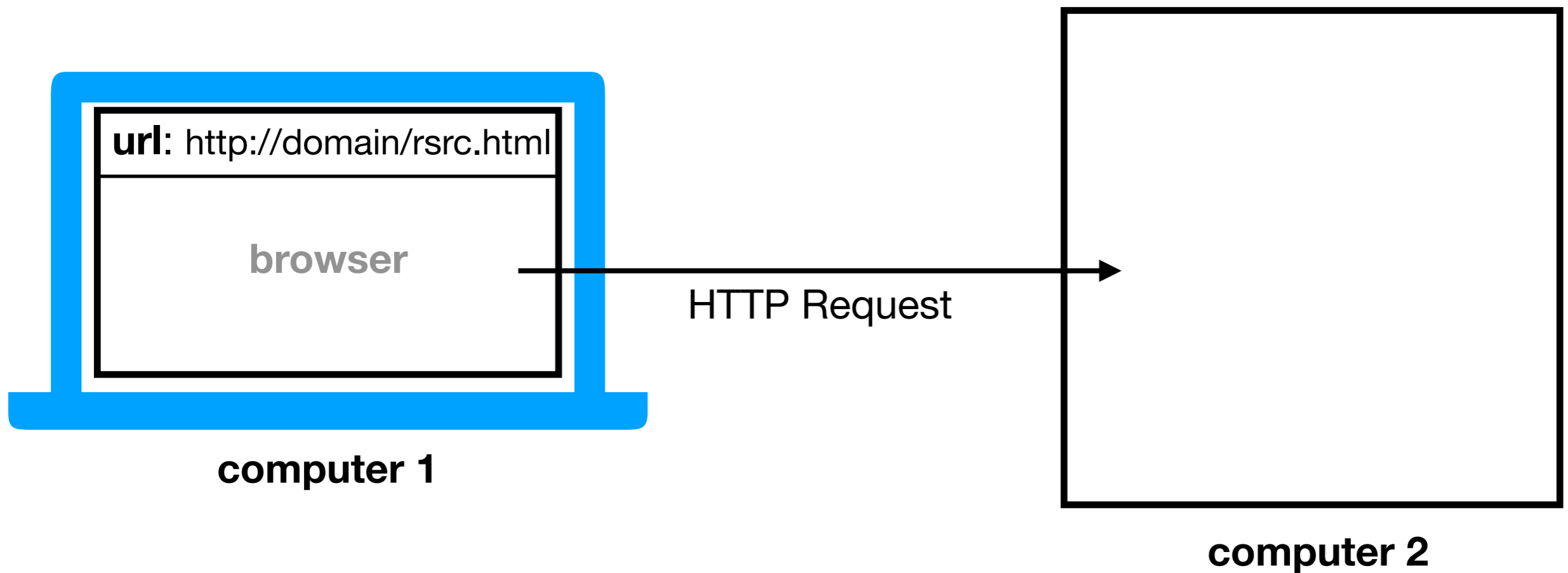
computer 2

Hypertext



Hypertext

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

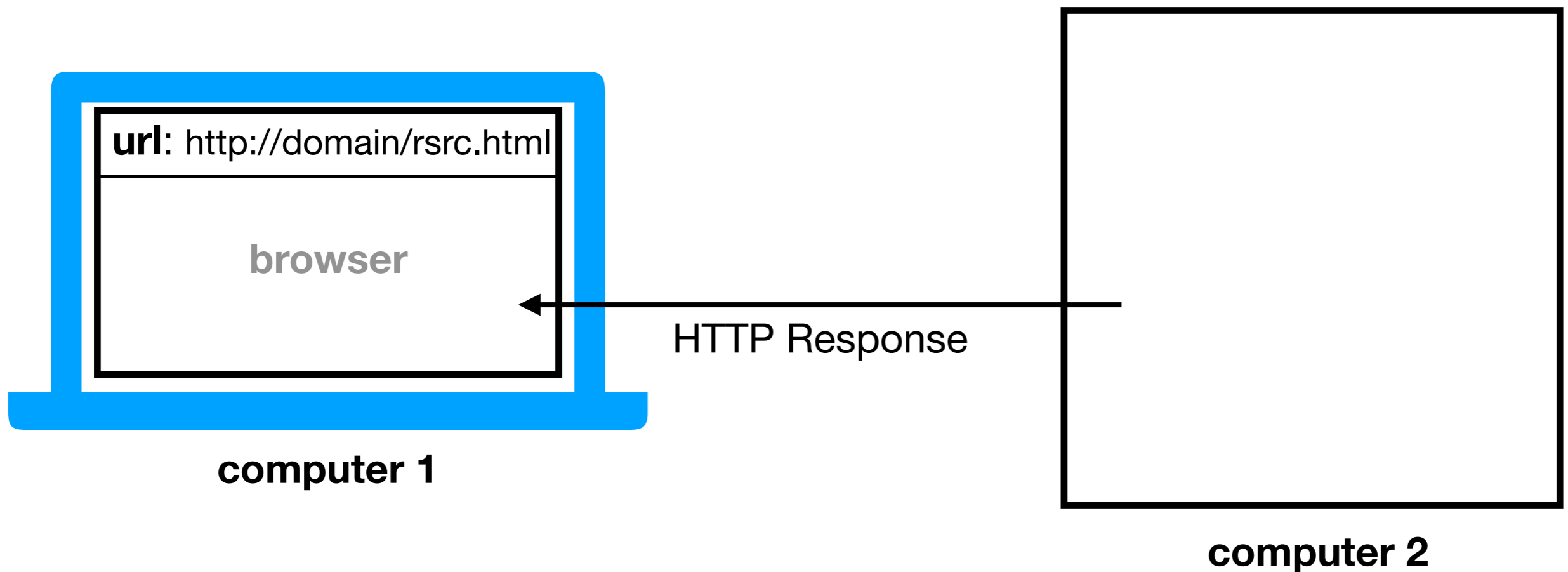


HTTP Request:

```
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:

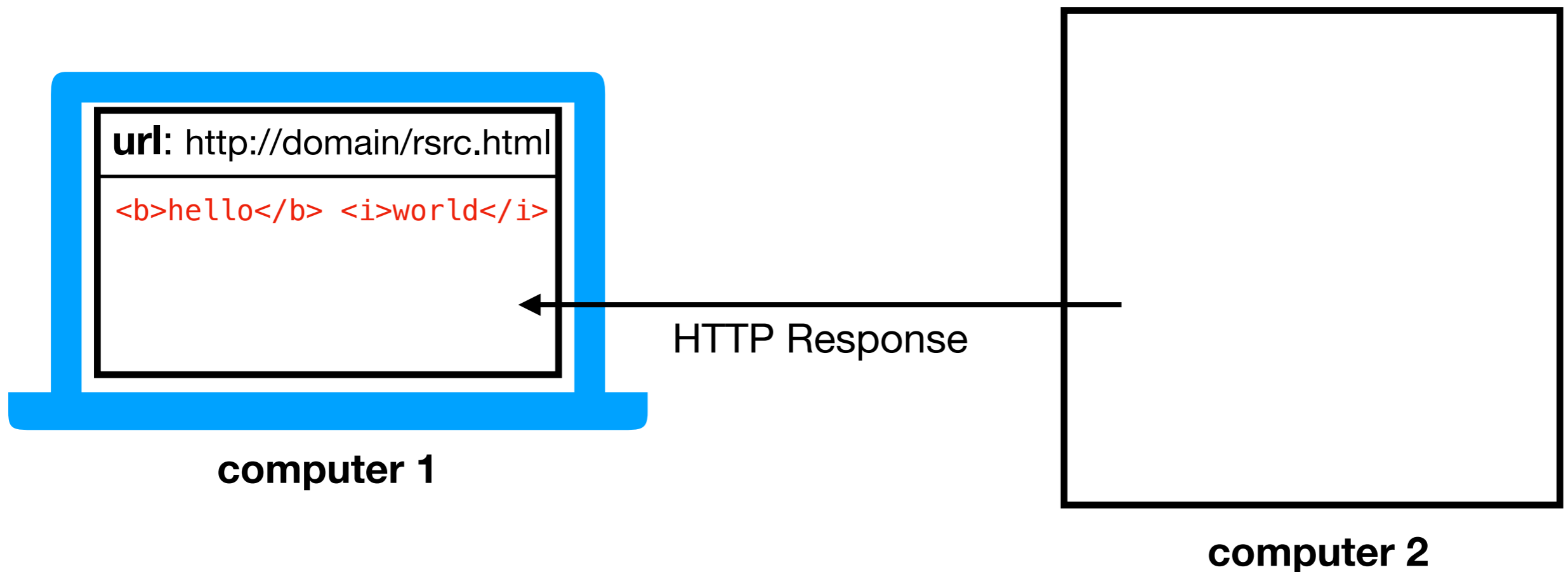
```
HTTP/1.0 200 OK
Content-Type: text/html; charset=utf-8
Content-Length: 74

<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:

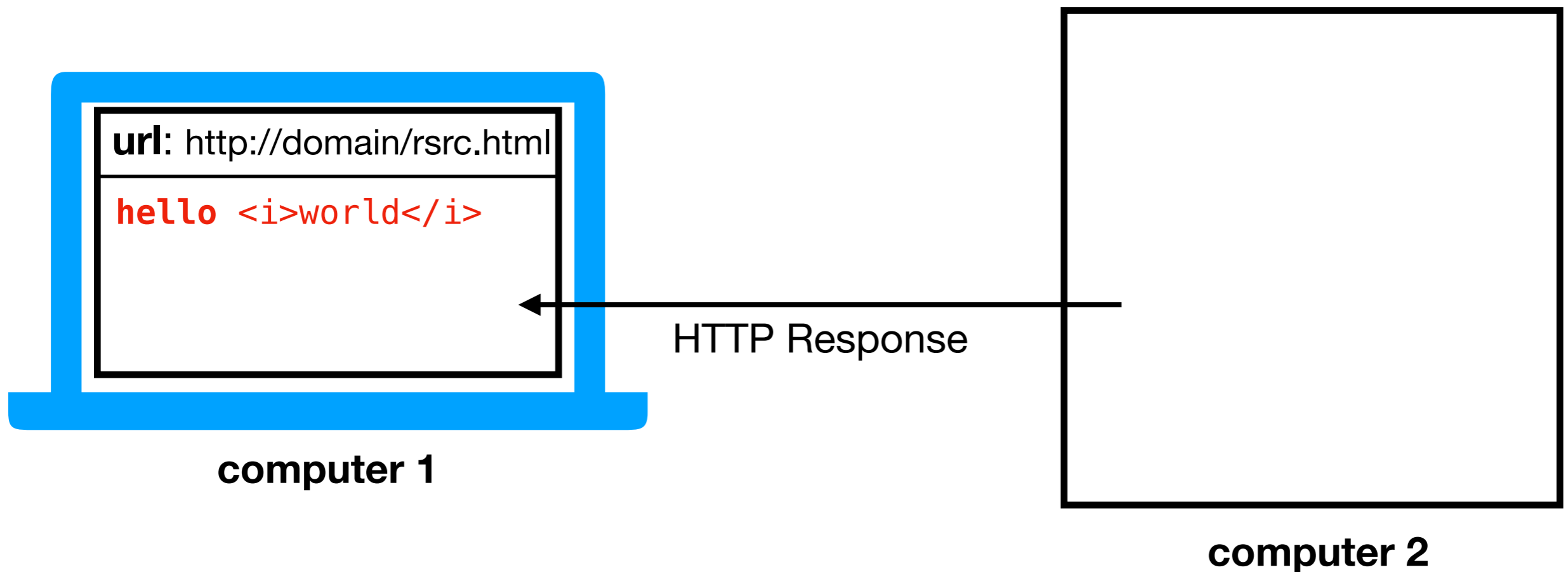
```
HTTP/1.0 200 OK  
Content-Type: text/html; charset=utf-8  
Content-Length: 74
```

hello <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:

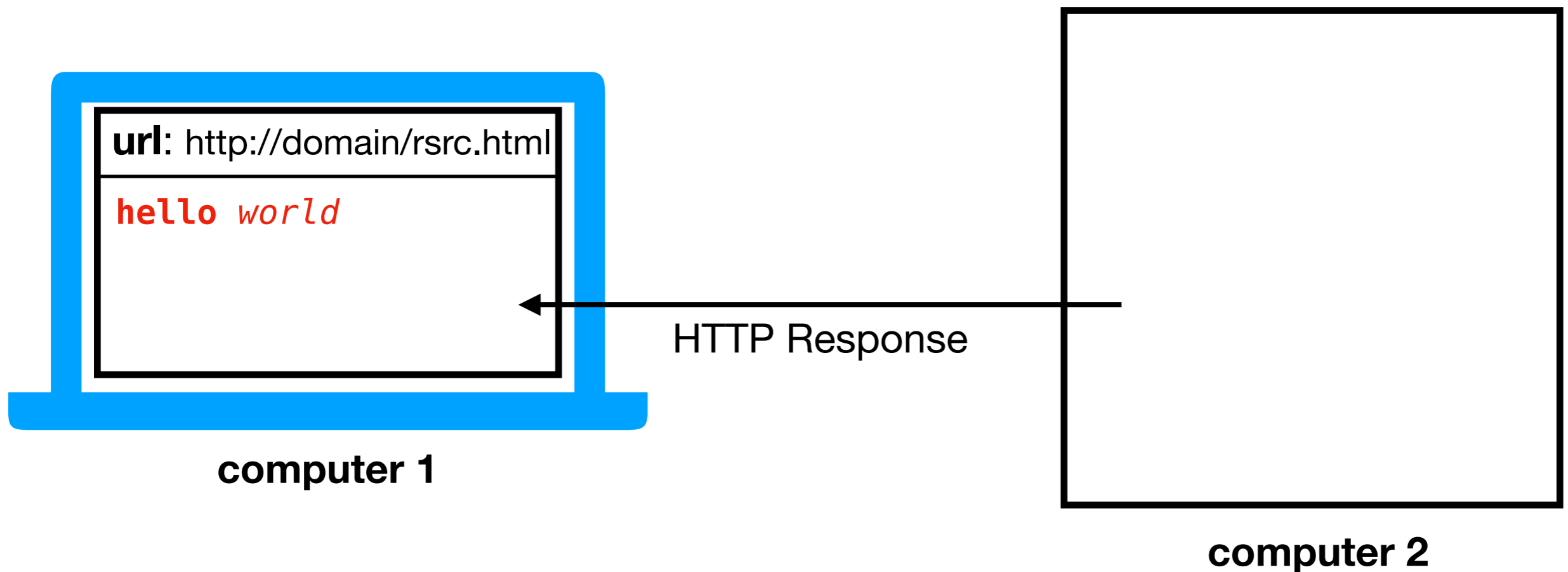
```
HTTP/1.0 200 OK  
Content-Type: text/html; charset=utf-8  
Content-Length: 74
```

```
<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:

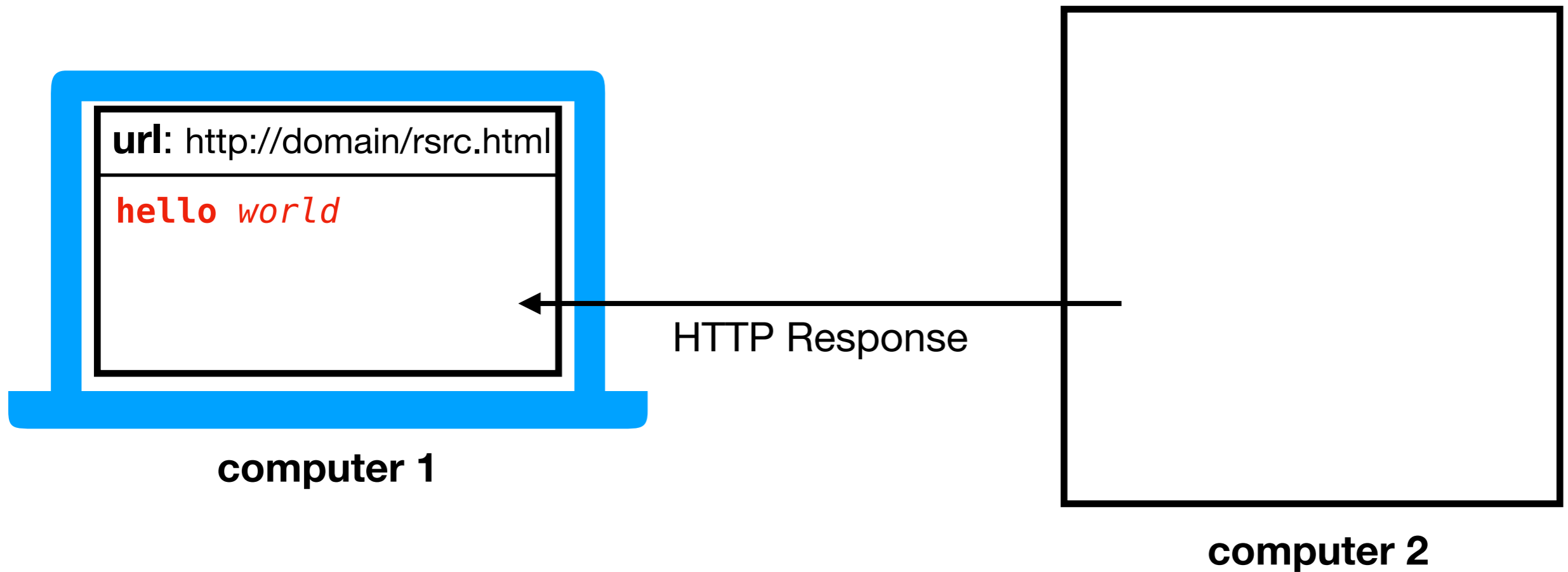
```
HTTP/1.0 200 OK  
Content-Type: text/html; charset=utf-8  
Content-Length: 74
```

```
<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
```

`hello <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:

- view source
- download page source (open locally)

Outline

Hypertext

Tag Syntax

Hyperlinks and Attributes

Images

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

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



opening tag:
tag name in angle brackets

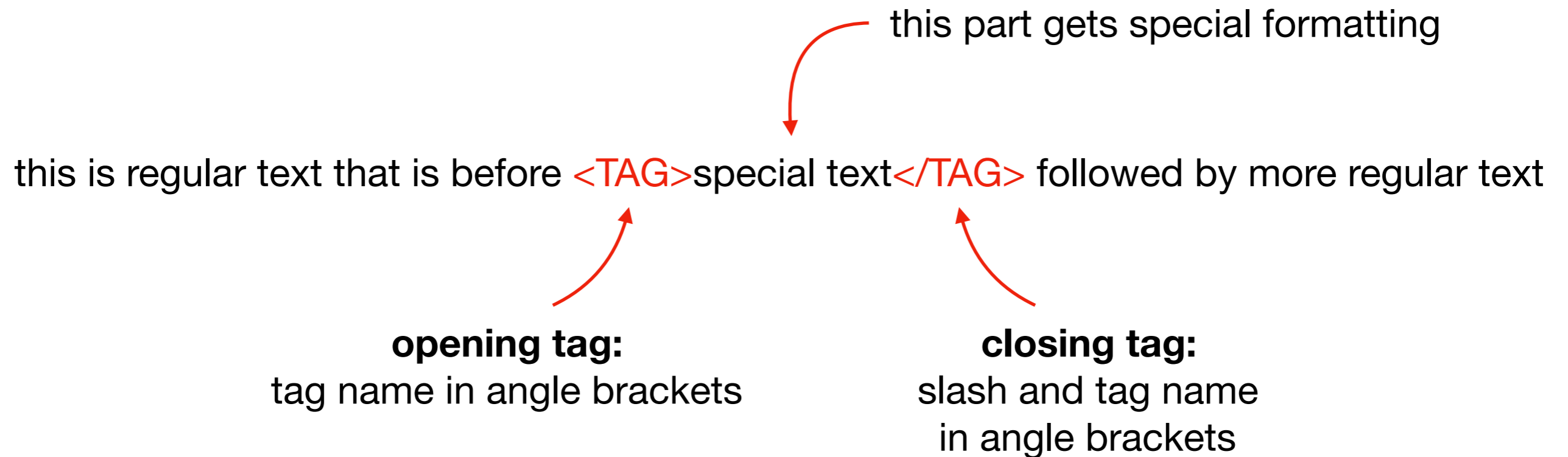


closing tag:
slash and tag name
in angle brackets

HTML Tags

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

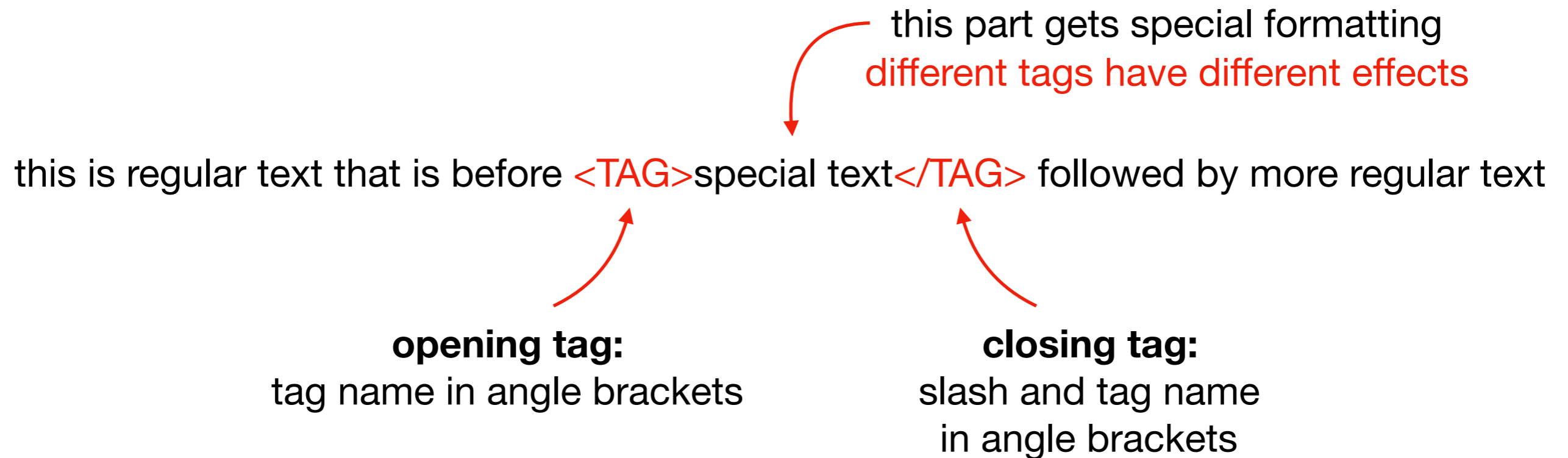
- often tags come in pairs (to indicate range of text to format)



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)



Simple Tags

test.html

This is a test page

This is a test page

Simple Tags

b: bold

test.html

This is a `test` page

This is a **test** page

Simple Tags

b: bold

test.html

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

This is a **test page**

Simple Tags

i: italic

test.html

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

This is a *test page*

Simple Tags

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

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.

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>
```



Welcome

This is a test page.

It is awesome.

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>
```



Welcome

This is a test page.

It is awesome.

Vertical Space

br: line break

test.html

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.

This is a test page.

It is awesome.

Vertical Space

br: line break

test.html

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.

```
<br><br><br><br>
```

It is awesome.

This is a test page.

It is awesome.

Vertical Space

br: line break

test.html

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

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

This is a test page.

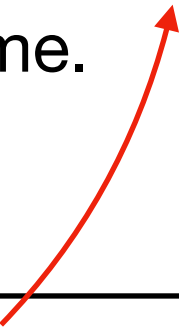
It is awesome.

Vertical Space

br: line break

test.html

```
This is a test page.  
<br /><br /><br /><br />  
It is awesome.
```



sometimes you'll encounter it like this

This is a test page.

It is awesome.

Lists

ul: unordered list

li: list item

test.html

Items:

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

Items:

- Item X

Lists

ul: unordered list

li: list item

test.html

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

test.html

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:

- arguments on command line

Output:

- HTML file with bulleted list

Example:

```
python bullets.py apple broccoli cabbage
```



Items:

- apple
- broccoli
- cabbage

Complete Web Page

Complete Web Page

test.html

This is a `test` page

This is a **test** page

Complete Web Page

whole page is usually
in html and body tags

test.html

This is a `test` page

This is a **test** 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>
```



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>
```



This is a **test** page

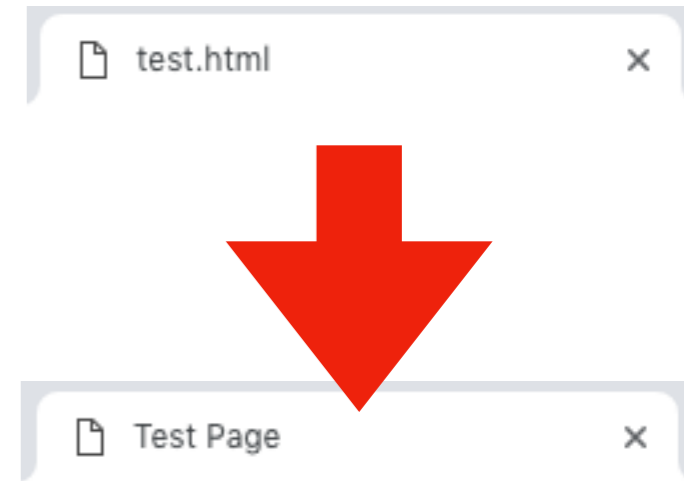
Complete Web Page

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>
```

This is a **test** page



Outline

Hypertext

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Self Learning

Hyperlinks

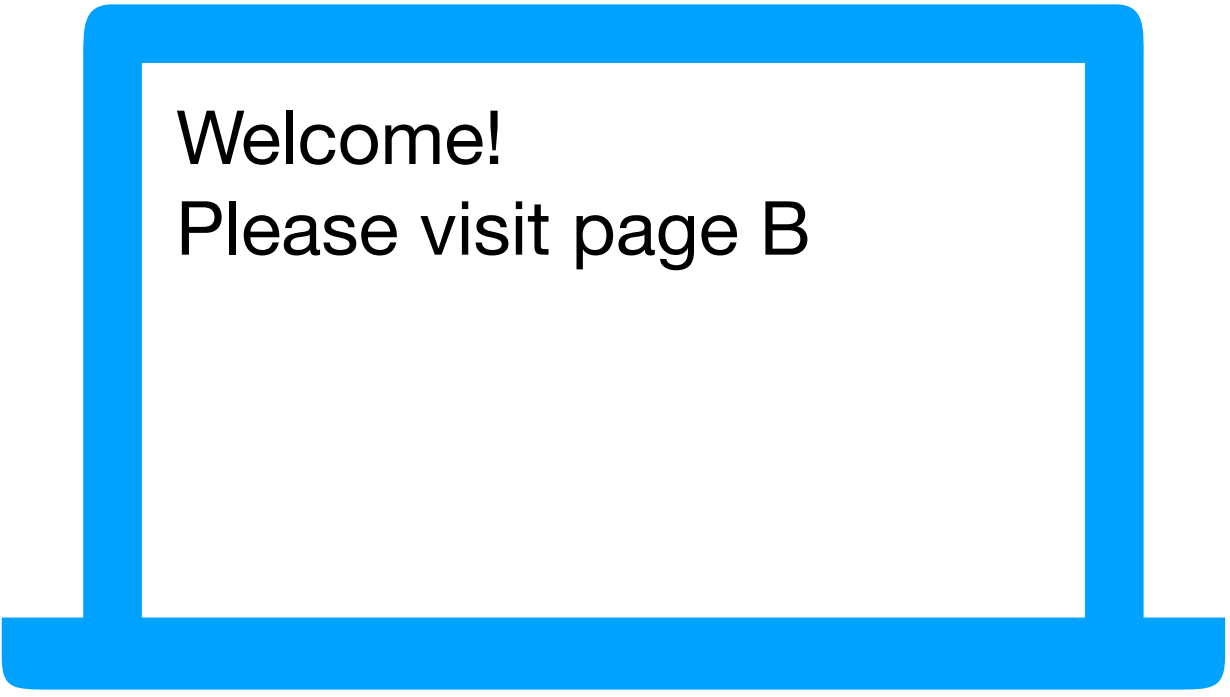
A.html

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.
```



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>
```

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

A.html

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

B.html

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

page B' is on the second line. The text 'page B' is underlined and blue, indicating a clickable link." data-bbox="50 600 498 935"/>

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"`

A.html

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

B.html

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

page B' is on the second line. The text 'page B' is underlined and blue, indicating a clickable link." data-bbox="48 600 498 935"/>

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"`

A.html

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

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"`

A.html

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

B.html

```
You're on 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

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Self Learning

Images

img: image

test.html

```

```



Images

img: image

test.html

```
W  
  
E
```

W  python™ E

Images

img: image

test.html

```
N<br>  
W  
  
E<br>  
S
```

N

W

S



python™

E

Images

img: image

test.html

```
N<br>  
W  
  
E<br>  
S
```



Images

img: image

test.html

```
N<br>
W

E<br>
S
```



Images

img: image

test.html

```
N<br>  
W  
  
E<br>  
S
```



Outline

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Self Learning

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>
```



A	B
C	D

Tables

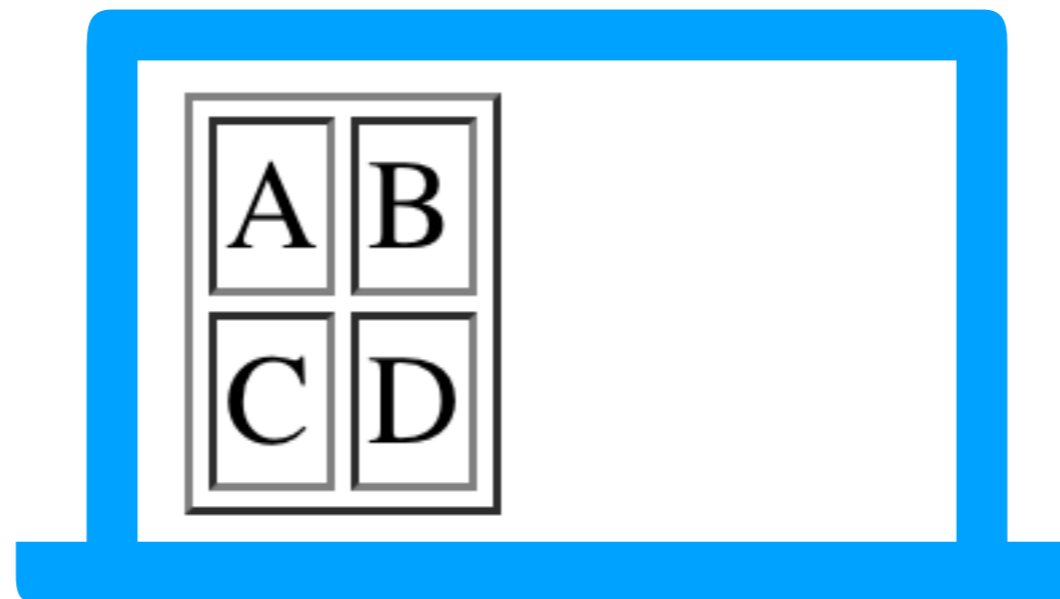
table: a table

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>
```



A	B
C	D

Tables

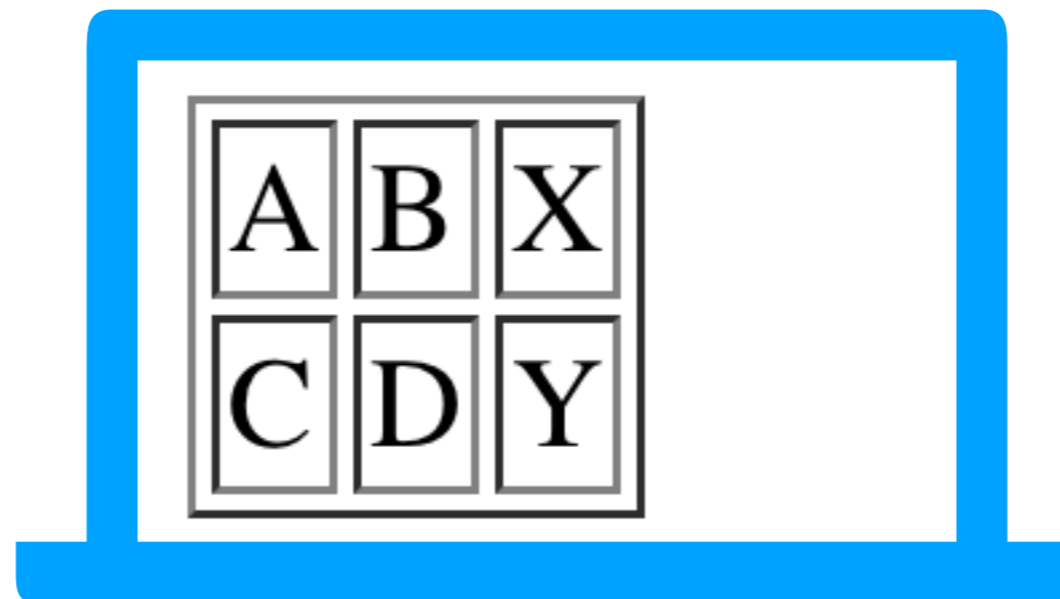
table: a table

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>
```



A	B	X
C	D	Y

Tables

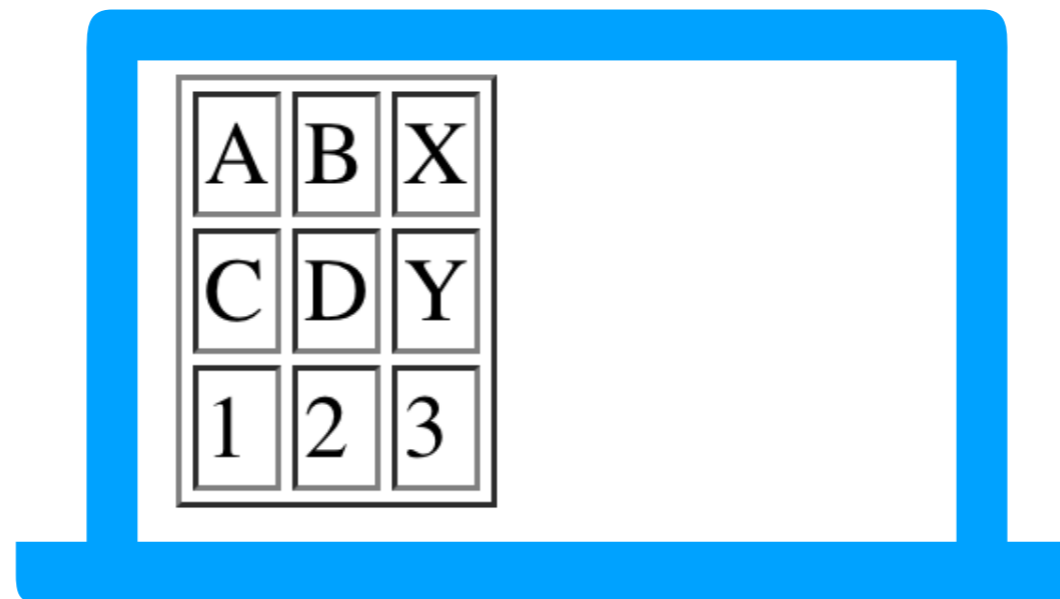
table: a table

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>2<td></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

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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