

Server-Side Web Programming: CGI (Part 2)

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Objectives

- We will cover...
 - CGI using the HTTP GET method (review)
 - CGI using the HTTP POST method
 - The GET method vs. the POST method

Agenda

- **CGI: GET Method (review)**
- CGI: POST Method
- GET vs. POST

CGI: GET Method (Review)

- **Common Gateway Interface (CGI)**
 - The oldest and simplest way to implement a Web app that generates content dynamically

CGI: GET Method (Review)

- To command browser to issue a HTTP **GET** request:
 - (1) Enter URL at top of browser
 - (2) Click on page link
 - (3) Submit a form whose method="get"

CGI: GET Method (Review)

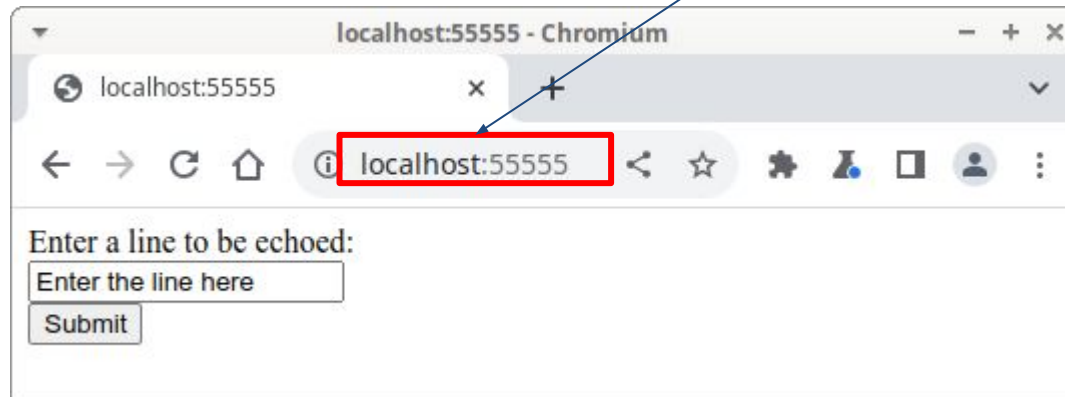
- See **EchoGet** app

```
$ python runserver.py 5555  
Serving HTTP on 0.0.0.0 port 55555 (http://0.0.0.0:55555/) ...
```

CGI: GET Method (Review)

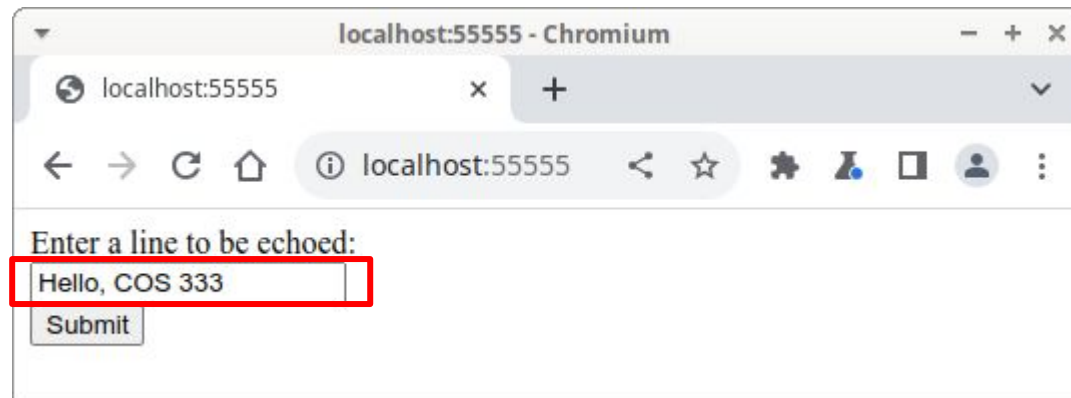
- See **EchoGet** app (cont.)

Default protocol is HTTP
Default page is index.html



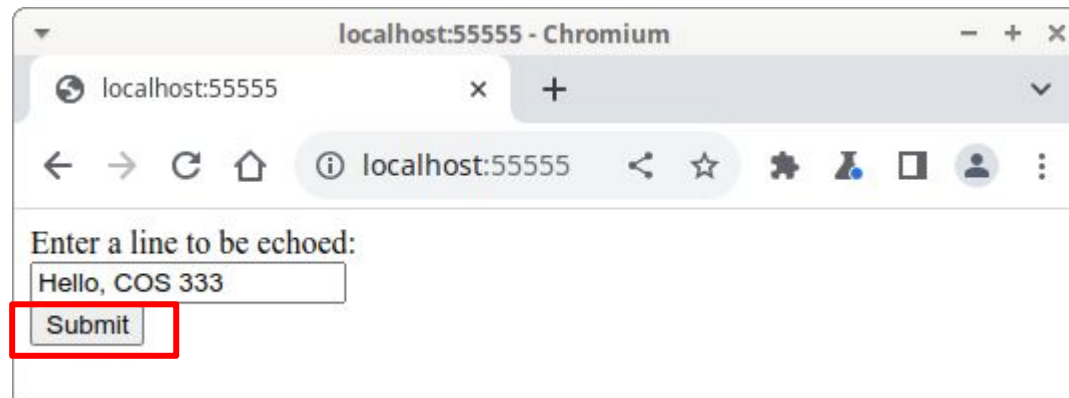
CGI: GET Method (Review)

- See **EchoGet** app (cont.)



CGI: GET Method (Review)

- See **EchoGet** app (cont.)

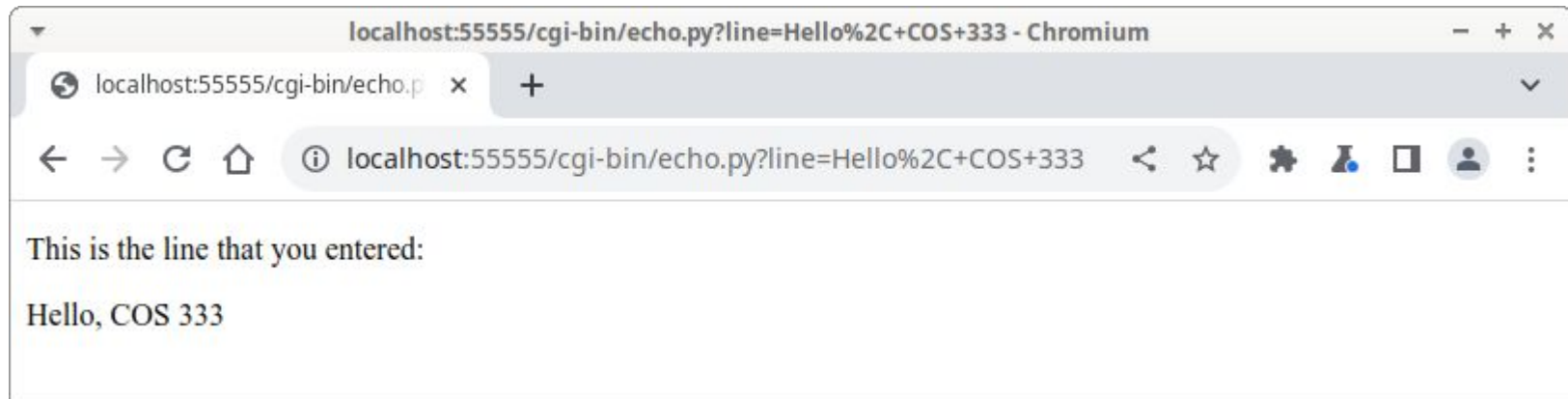


Browser sends HTTP request as if generated by clicking on a page link with href

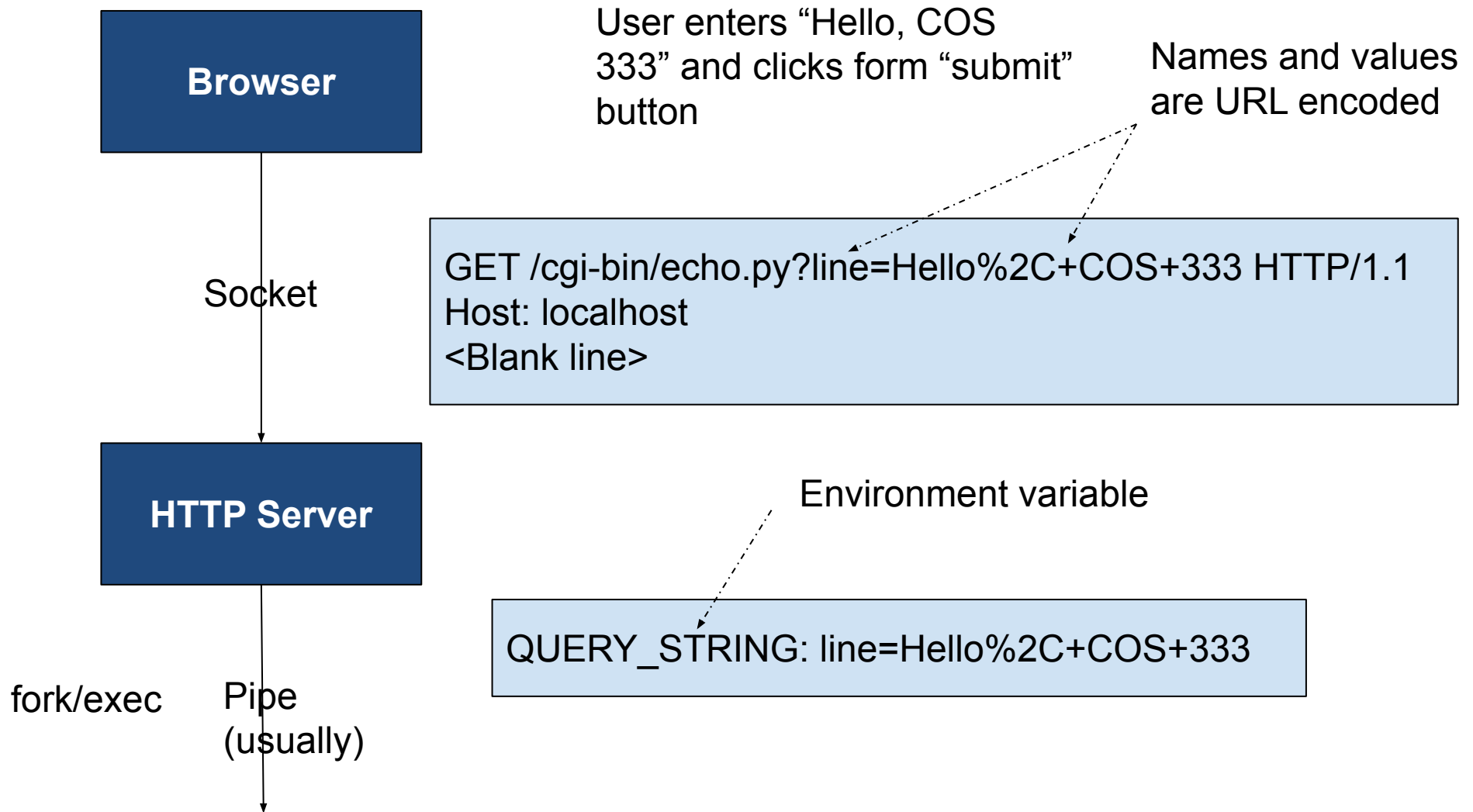
```
http://localhost:55555/cgi-bin/echo.py?  
line=Hello%2C+COS+333
```

CGI: GET Method (Review)

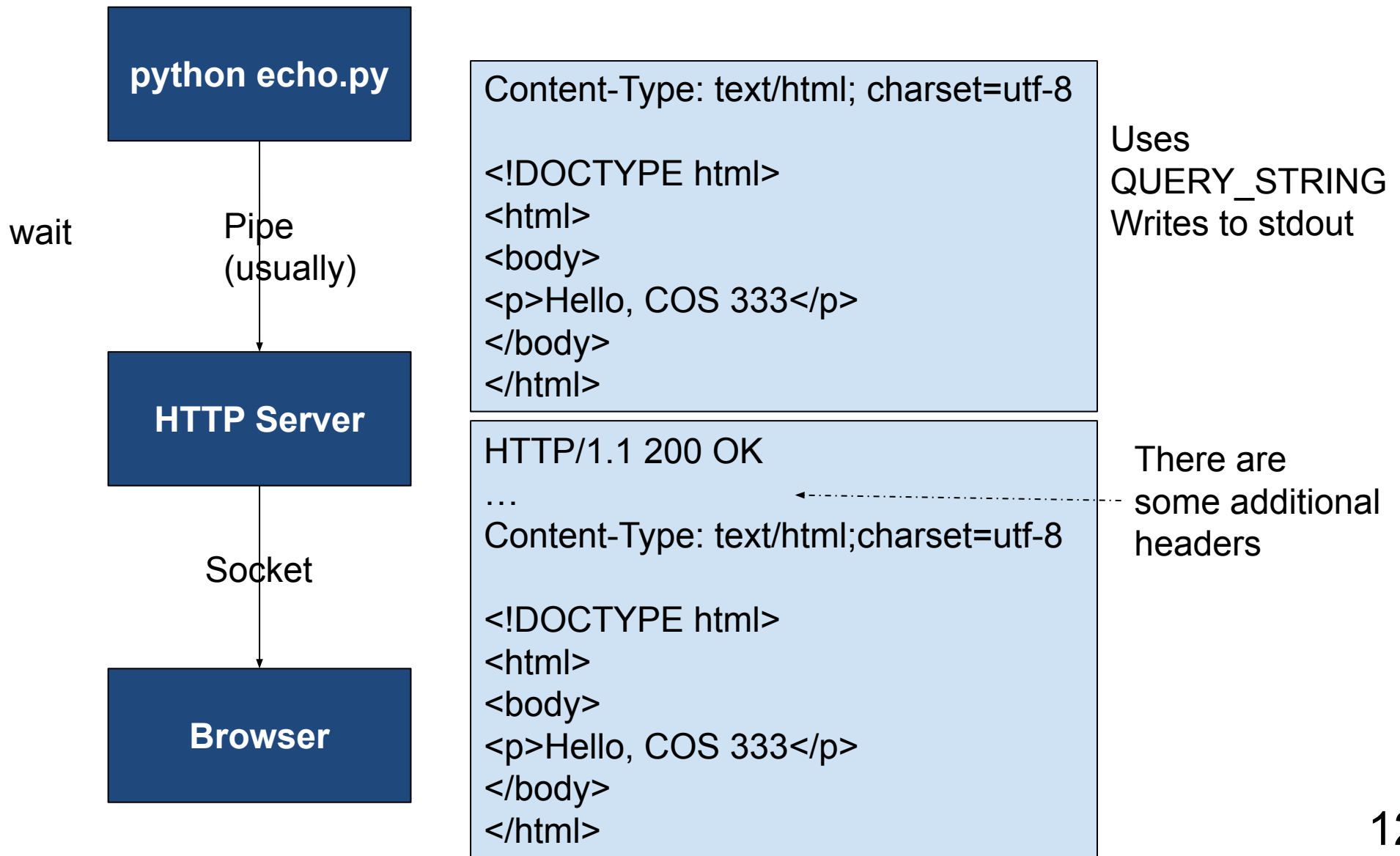
- See **EchoGet** app (cont.)



CGI: GET Method (Review)



CGI: GET Method (Review)



CGI: GET Method (Review)

- See **EchoGet** app (cont.)
 - **runserver.py**
 - **index.html**
 - **cgi-bin/parseargs.py**
 - **cgi-bin/echo.py**

Agenda

- CGI: GET Method (review)
- **CGI: POST Method**
- GET vs. POST

CGI: POST Method

- To command browser to issue a HTTP **POST** request:
 - (1) Submit a form whose method="post"

CGI: POST Method

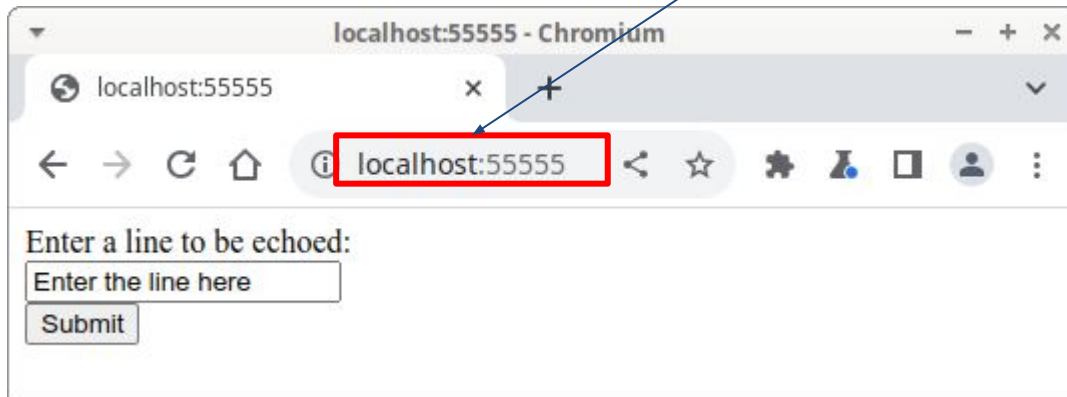
- See **EchoPost** app

```
$ python runserver.py 55555  
Serving HTTP on 0.0.0.0 port 55555 (http://0.0.0.0:55555/) ...
```


CGI: POST Method

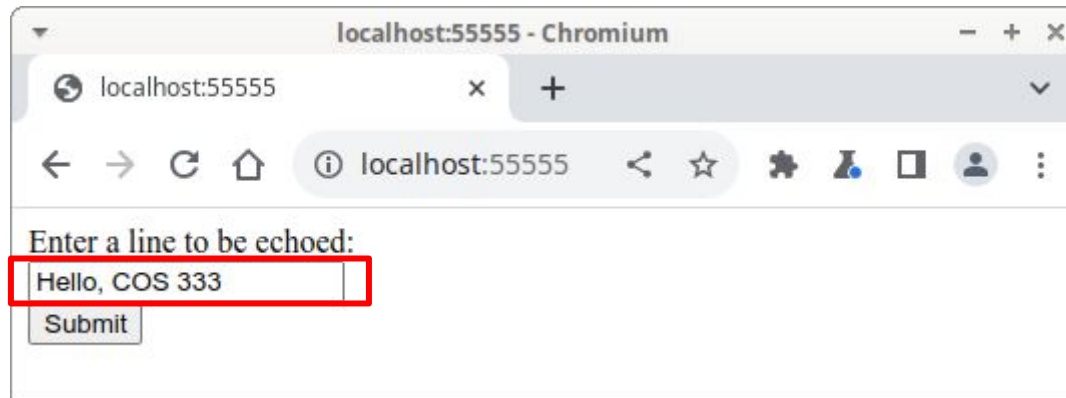
- See **EchoPost** app (cont.)

Default protocol is HTTP
Default page is index.html



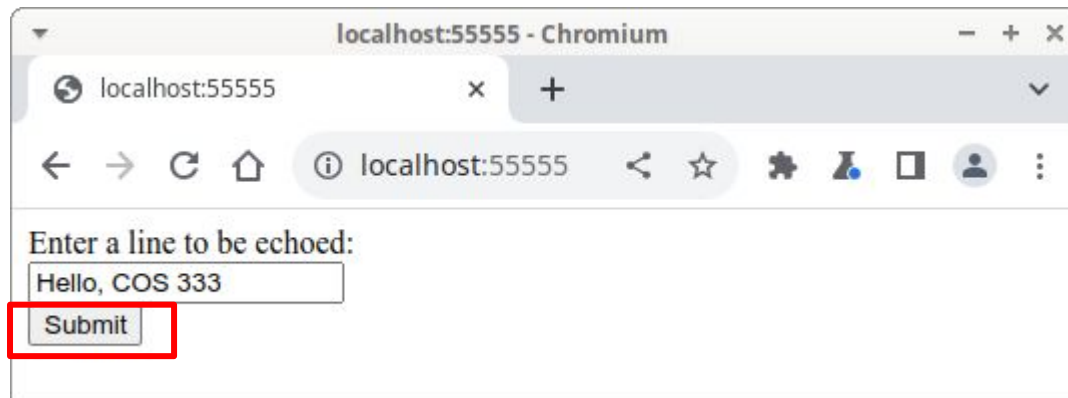
CGI: POST Method

- See **EchoPost** app (cont.)



CGI: POST Method

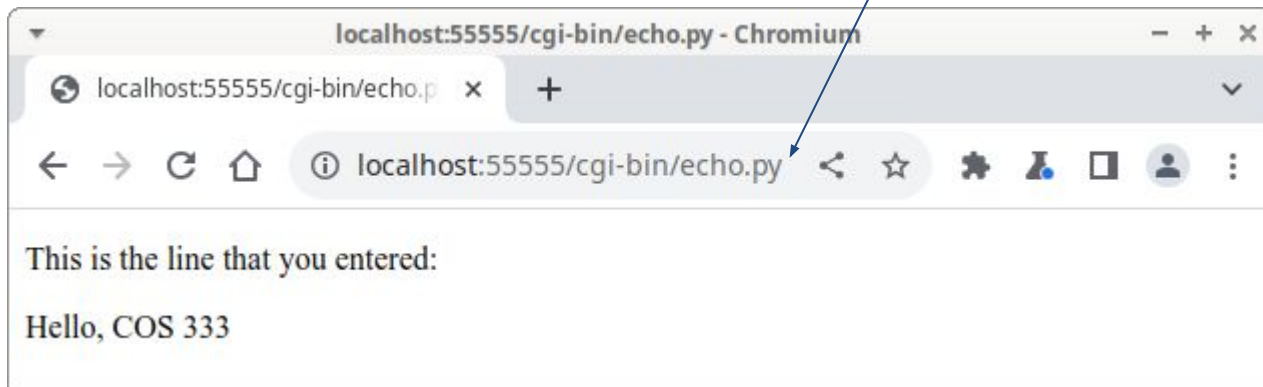
- See **EchoPost** app (cont.)



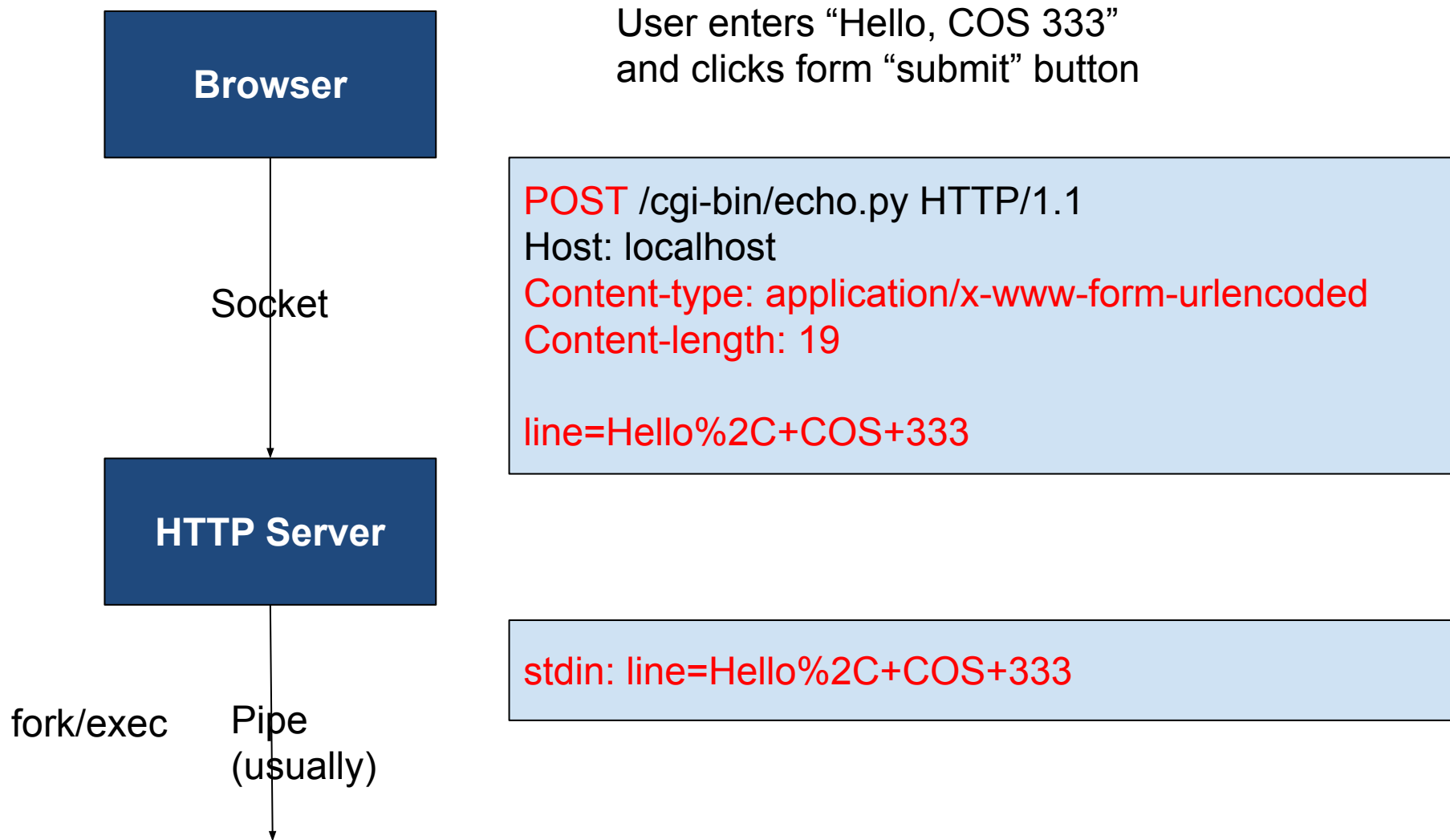
CGI: POST Method

- See **EchoPost** app (cont.)

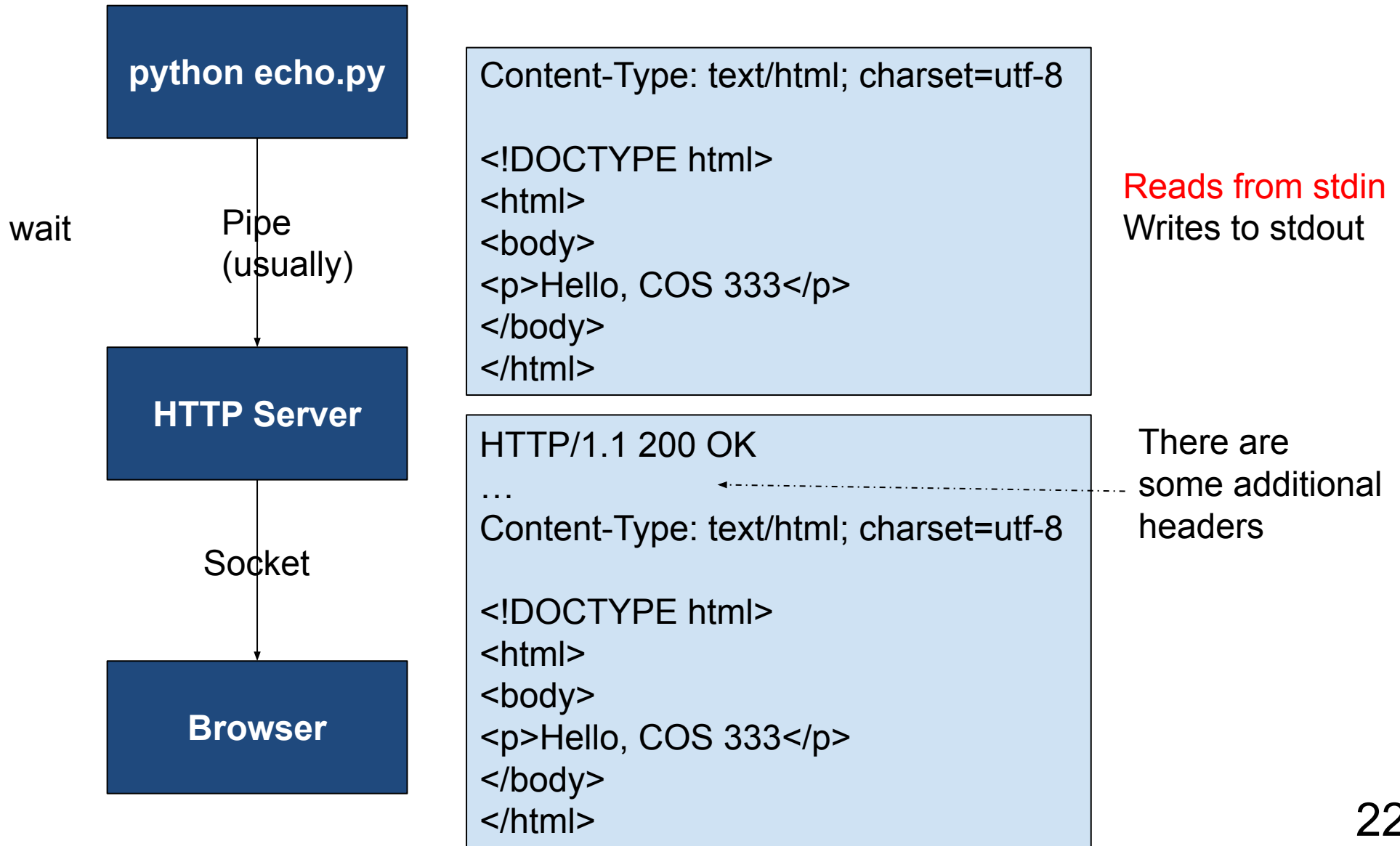
No name=value pairs in URL



CGI: POST Method



CGI: POST Method

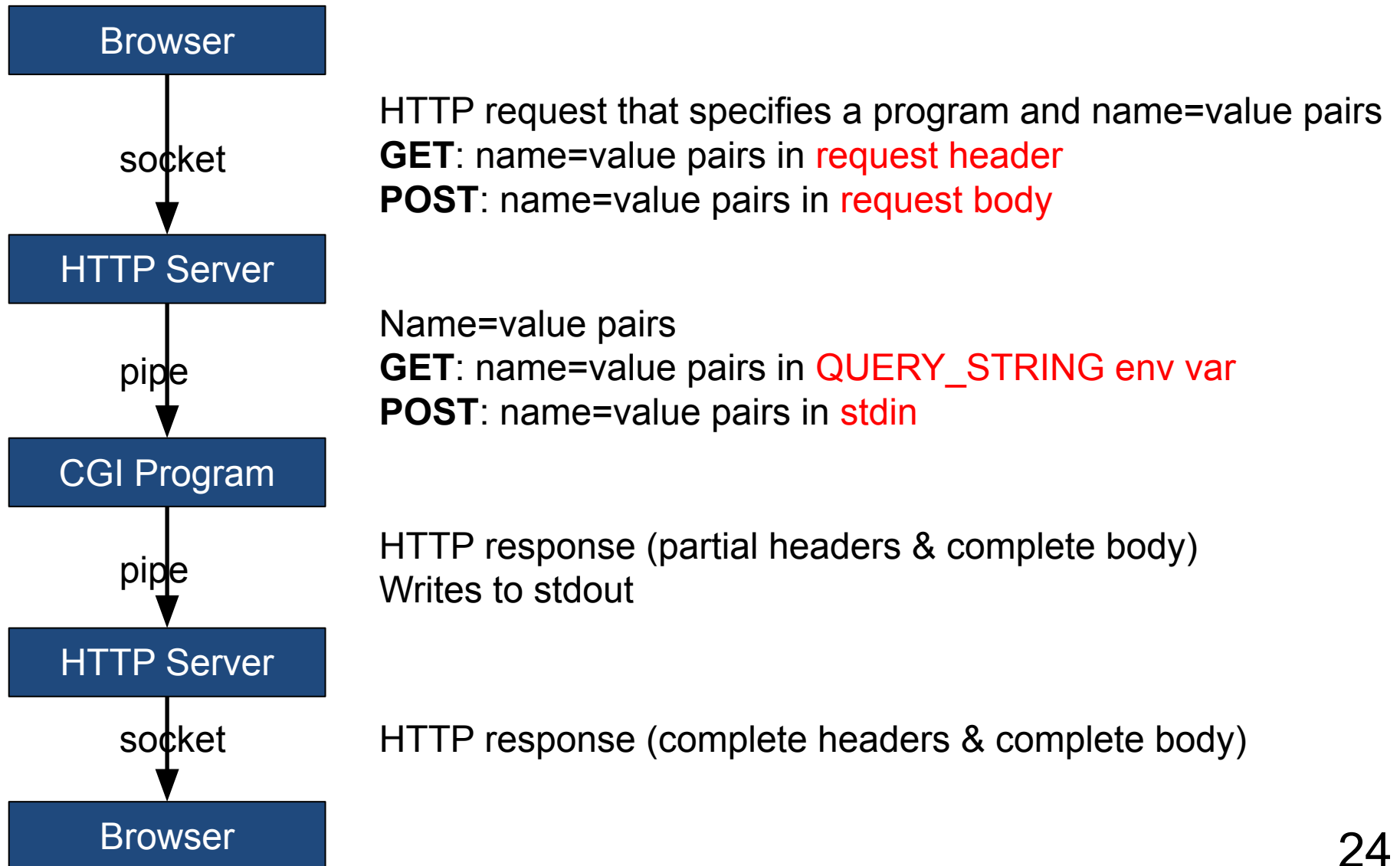


CGI: POST Method

- See **EchoPost** app (cont.)
 - runserver.py
 - **index.html**
 - cgi-bin/parseargs.py
 - **cgi-bin/echo.py**

CGI: POST Method

Review:



Agenda

- CGI: GET Method (review)
- CGI: POST Method
- **GET vs. POST**

GET vs. POST

- When to use **GET**?
- When to use **POST**?

GET vs. POST

- Debugging considerations
 - Easy to send GET requests from browser with arbitrary name=value pairs
 - Use **GET** when debugging

GET vs. POST

- Technical considerations
 - Some HTTP servers reject long headers
 - Use **POST** when:
 - There are very many name=value pairs
 - Some name=value pairs are very long

GET vs. POST

- Security considerations
 - Some HTTP servers store request URLs in log files
 - Use **POST** when:
 - Some name=value pairs must be kept secure
 - E.g., passwords

GET vs. POST

- Convention (informally):
 - Use **GET** if the app's processing **will not** change persistent data
 - Use **POST** if the app's processing **will** change persistent data

GET vs. POST

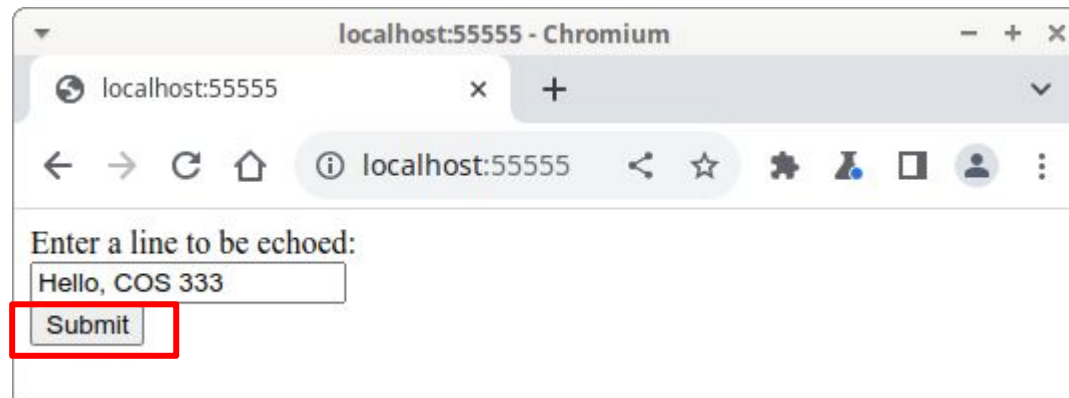
- Convention:
 - **Example:** HTTP request commands app to provide price for a bicycle => **GET**
 - **Example:** HTTP request commands app to purchase a bicycle => **POST**

GET vs. POST

- Browser has sent **GET** request =>
 - Browser assumes request **will not** change persistent data
 - Browser **does not warn** about page reload
- Browser has sent **POST** request =>
 - Browser assumes request **will** change persistent data
 - Browser **warns** about page reload

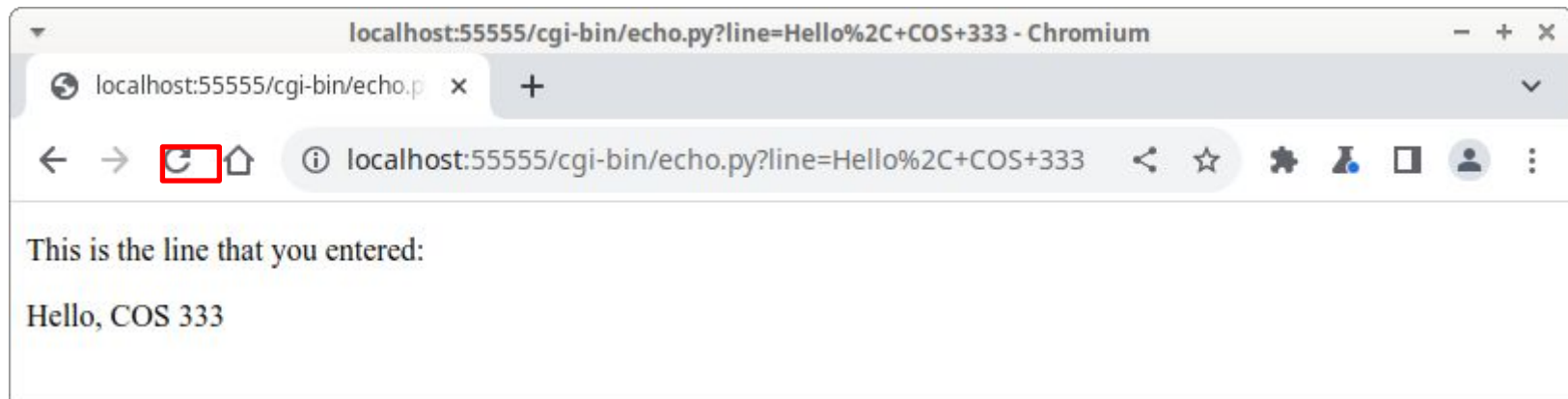
GET vs. POST

- See **EchoGet** app



GET vs. POST

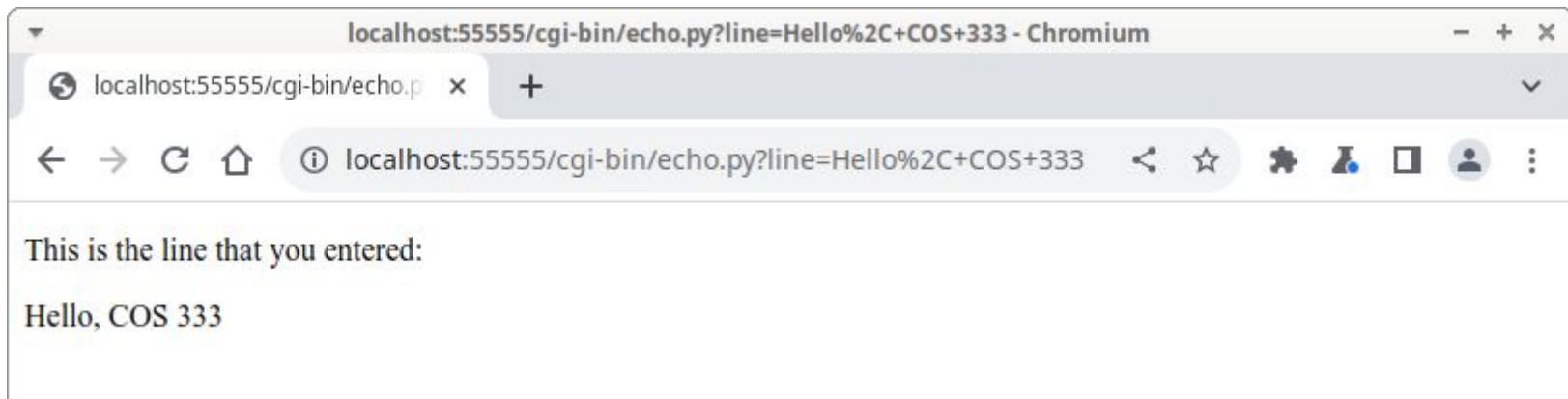
- See EchoGet app (cont.)



Reload this page

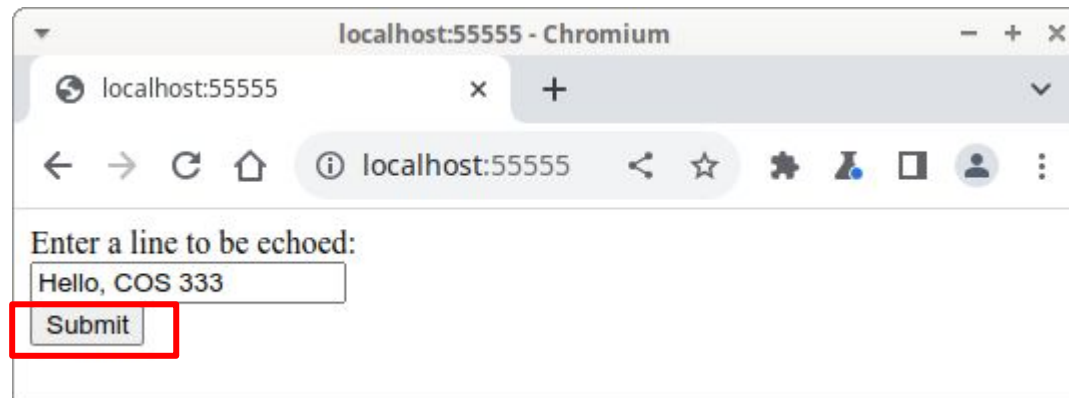
GET vs. POST

- See **EchoGet** app (cont.)



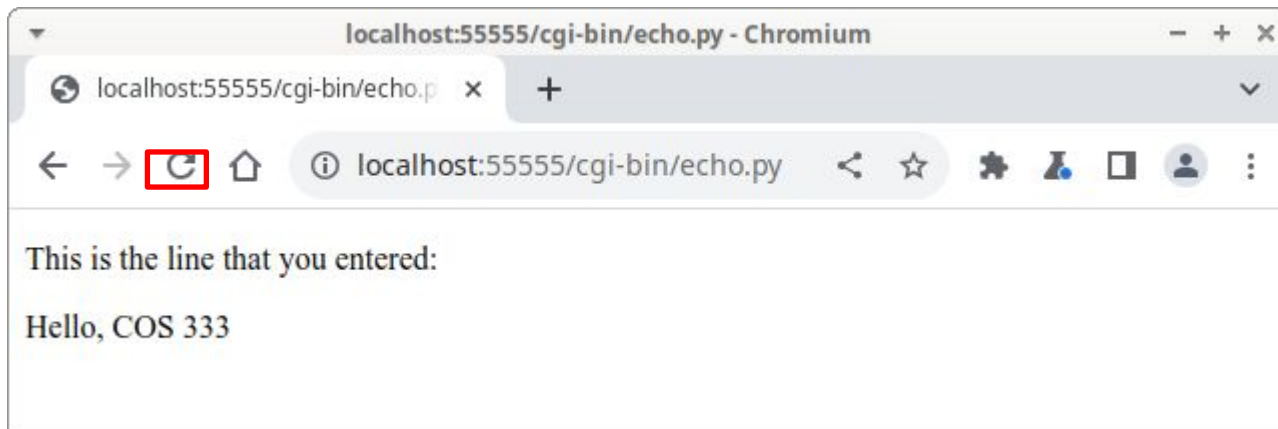
GET vs. POST

- See **EchoPost** app



GET vs. POST

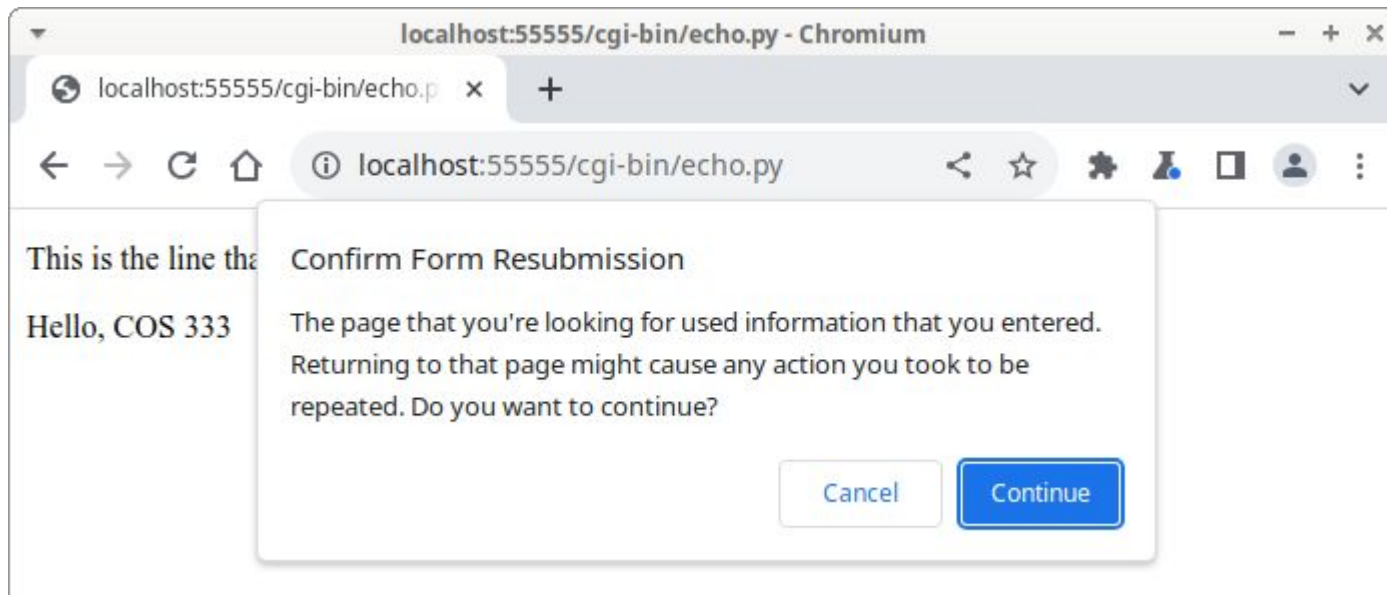
- See **EchoPost** app (cont.)



Reload this page

GET vs. POST

- See **EchoPost** app (cont.)



Aside: HTTP Methods

- **HTML** uses:
 - GET, POST
- **HTTP** defines:
 - GET, POST
 - PUT, PATCH, DELETE, CONNECT, HEAD, OPTIONS, TRACE
 - Sometimes used with AJAX requests (described later)

Aside: HTTP Methods

Method	Conventional Purpose	Idempotent?
GET	Retrieve resource	Yes
POST	Create resource	No
PUT	Replace resource	Yes
PATCH	Update resource	No
DELETE	Delete resource	Yes

Others: **CONNECT, HEAD, OPTIONS, TRACE**

See Chapter 14 of *Flask Web Development*
by Miguel Grinberg

Summary

- We have covered:
 - CGI using the HTTP GET method (review)
 - CGI using the HTTP POST method
 - The GET method vs. the POST method