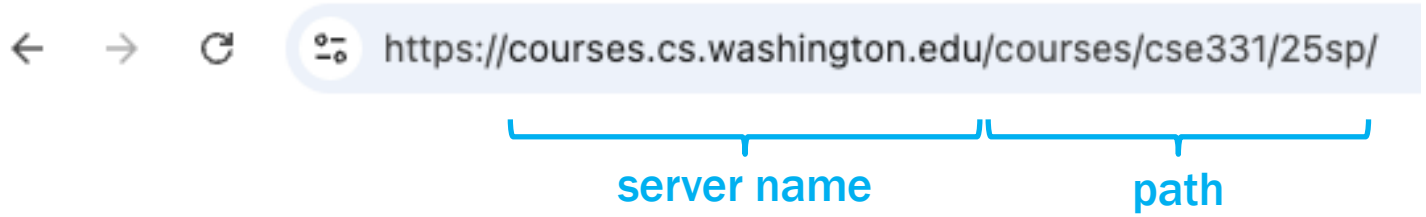
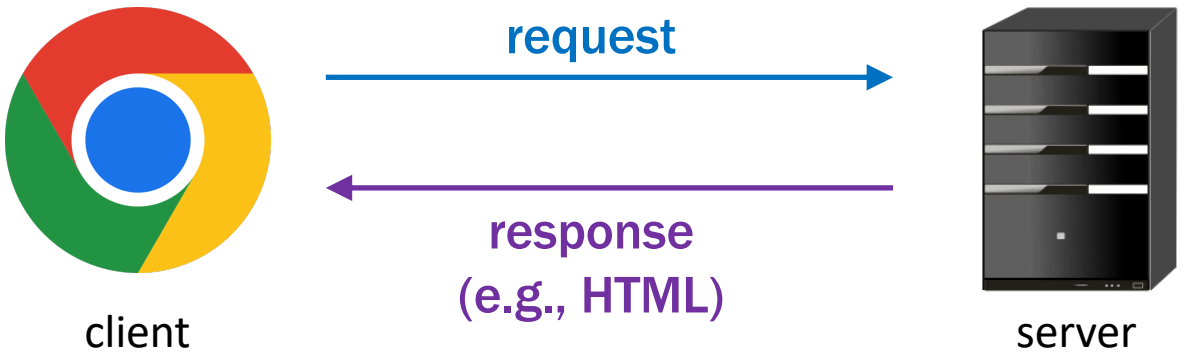
HTTP Servers

Browser Operation

- Browser reads the URL to find what HTML to load



- Contacts the given server and asks for the given path



URL Parts

- URLs have more parts than just server and path:

- Server name identifies the computer to talk to
  - uses the HTTP(S) protocol

- Conceptually:
  - path identifies code to execute on the server
  - search string is input passed to that file when run
  - (fragment will not be important for us)

Query Parameters

- Search string can pass multiple values at once
  - we call these "query parameters"
- Each parameter is of the form "`name=value`"
  - no spaces around the "="
- Multiple values are placed together with "`&`"s in between

```
?a=3&b=foo&c=Matt
```

  - encodes three query parameters: a is "3", b is "foo", c is "Matt"

HTTP Terminology: Requests

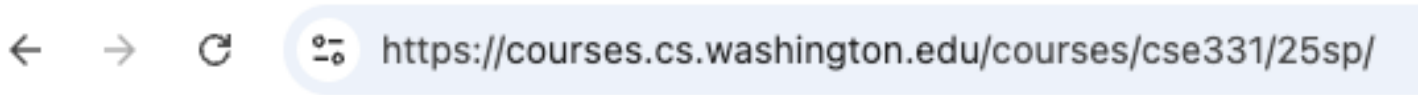
- HTTP request includes
  - **URL:** path and query parameters
  - **method:** GET or POST

    GET is used to *read* data stored on the server (cacheable)

    POST is used to *change* data stored on the server
  - **body (for POST only)**

    useful for sending large or **non-string** data with the request

- Browser issues a GET request when you type URL



HTTP Terminology: Responses

- HTTP response includes
  - **status code**: 200 (ok), 400-99 (client error), or 500-99 (server error)

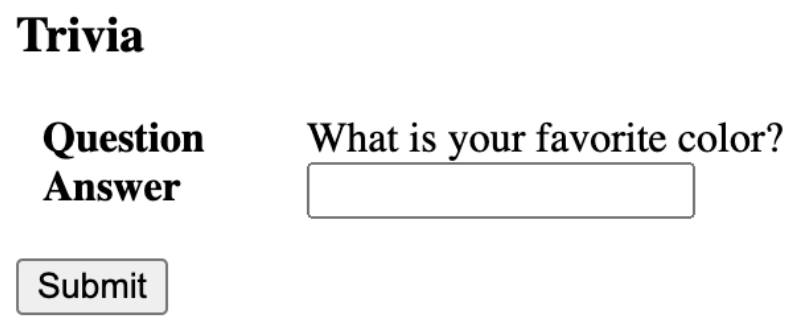
    was the server able to respond
  - **content type**: text/HTML or application/JSON (for us)

    what sort of data did the server send back
  - **content**

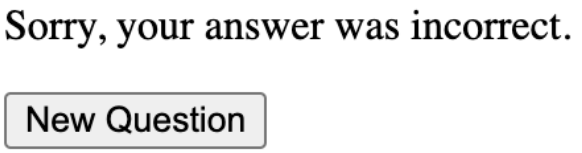
    in format described by the Content Type

- Browser expects HTML to display in the page
  - we will always send JSON or text to the browser

Example App: Interface

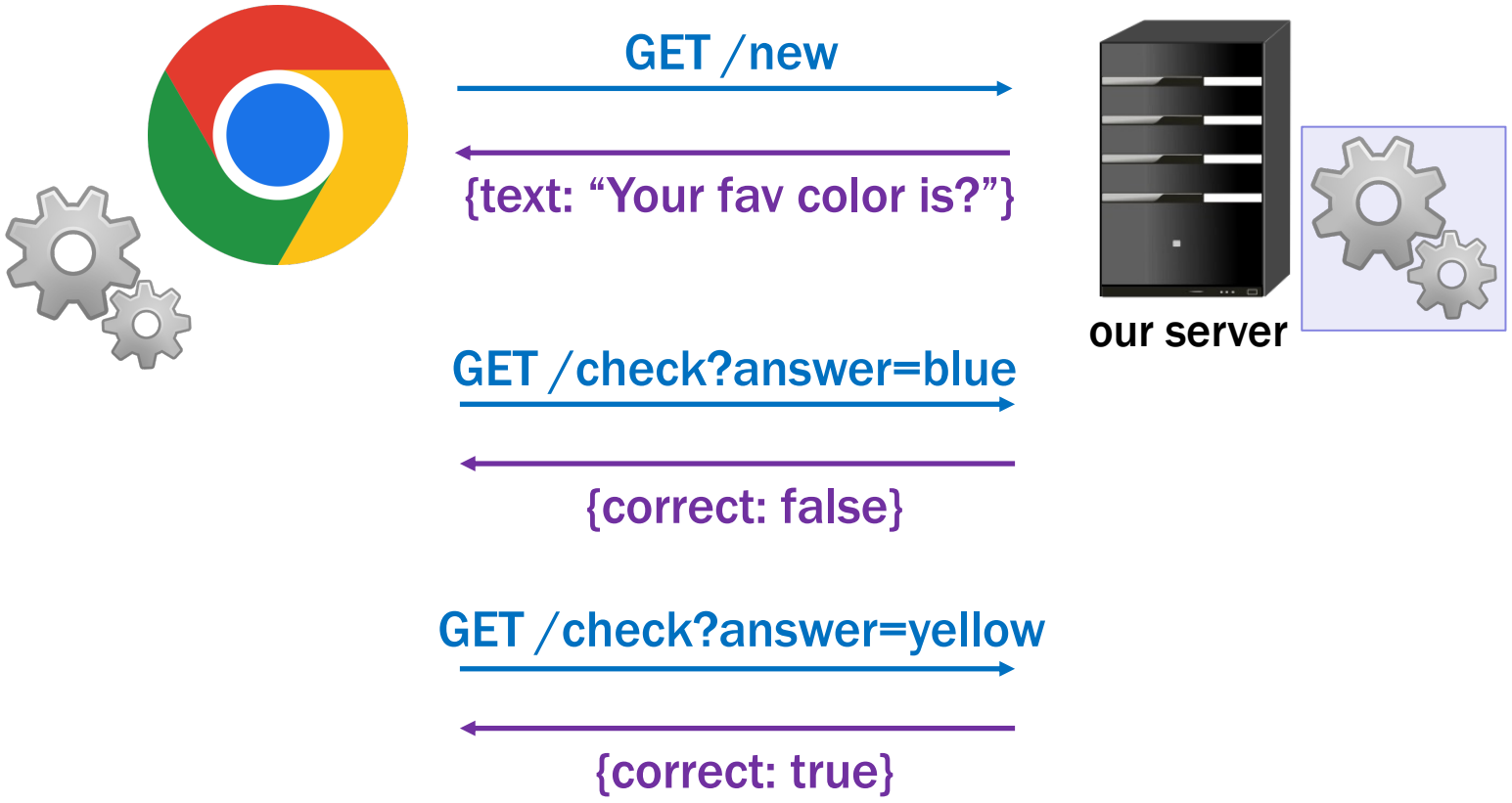


User types “blue” and presses “Submit”...

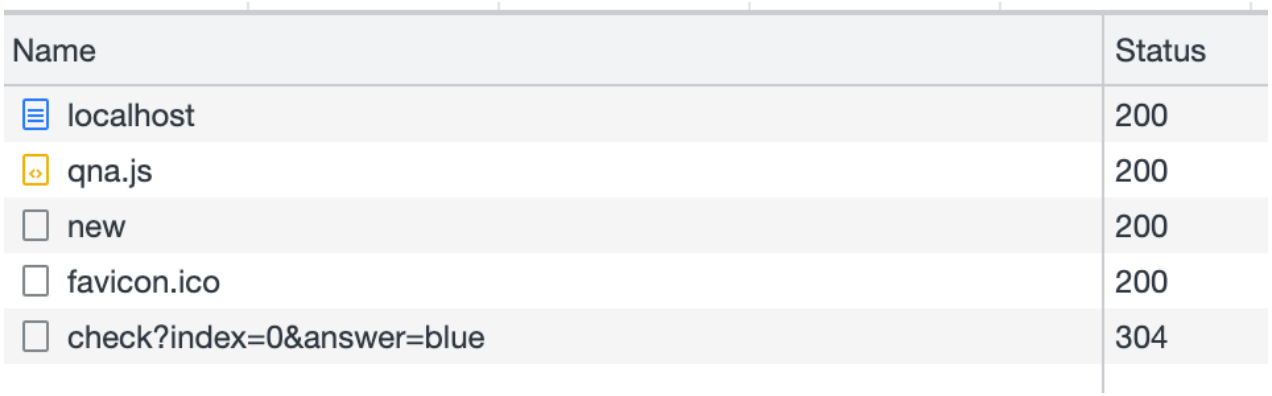


Example App: Requests and Responses

Apps will make sequence of requests to server



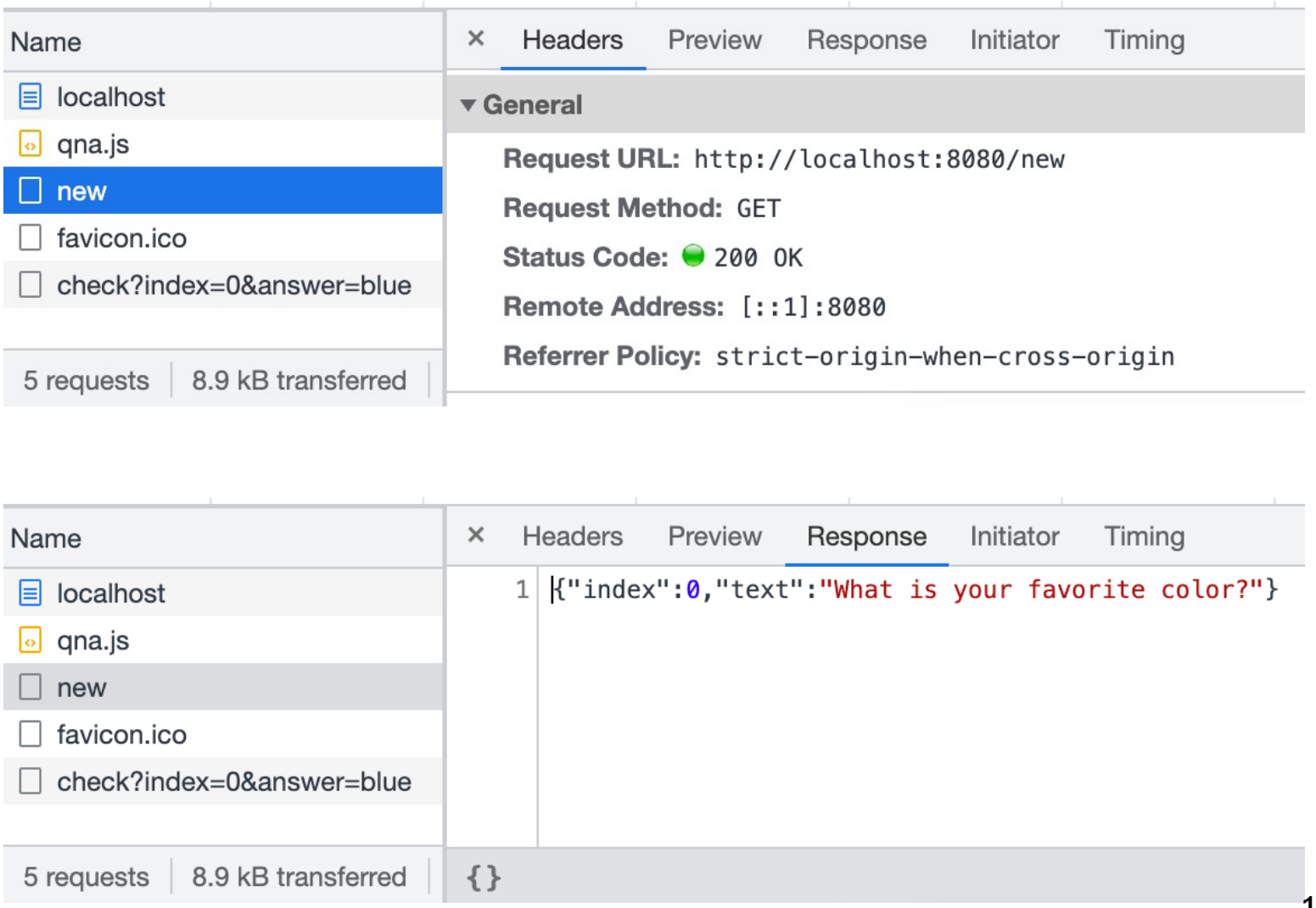
“Network” Tab Shows Requests



Name	Status
localhost	200
qna.js	200
new	200
favicon.ico	200
check?index=0&answer=blue	304

- Shows every request to the server
  - first request loads the app (as usual)
  - “`new`” is a request to get a question
  - “`check?index=0&answer=blue`” is a request to check answer
- Click on a request to see details…

“Network” Tab Shows Request & Response



JSON

- **JavaScript Object Notation**
  - **text description of JavaScript object**
  - **allows strings, numbers, null, arrays, and records**

    no undefined and no instances of classes

    no '..' (single quotes), only ".."

    requires quotes around keys in records

- **Translation into string done *automatically* by send**

```
res.send({index: 0, text: 'What is your …?'});
```