

Mobile Application Development

Higher Diploma in Science in Computer Science

Produced
by

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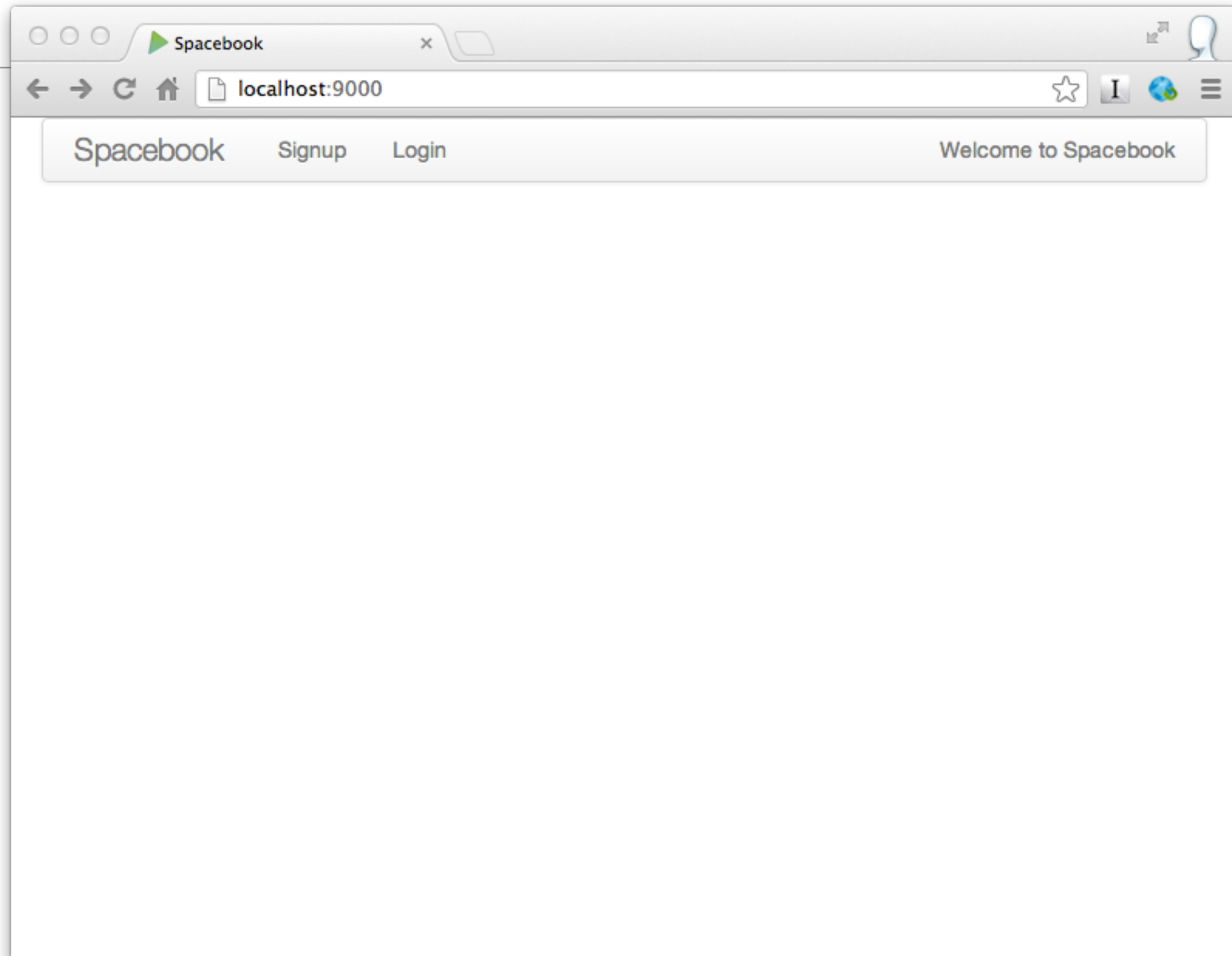


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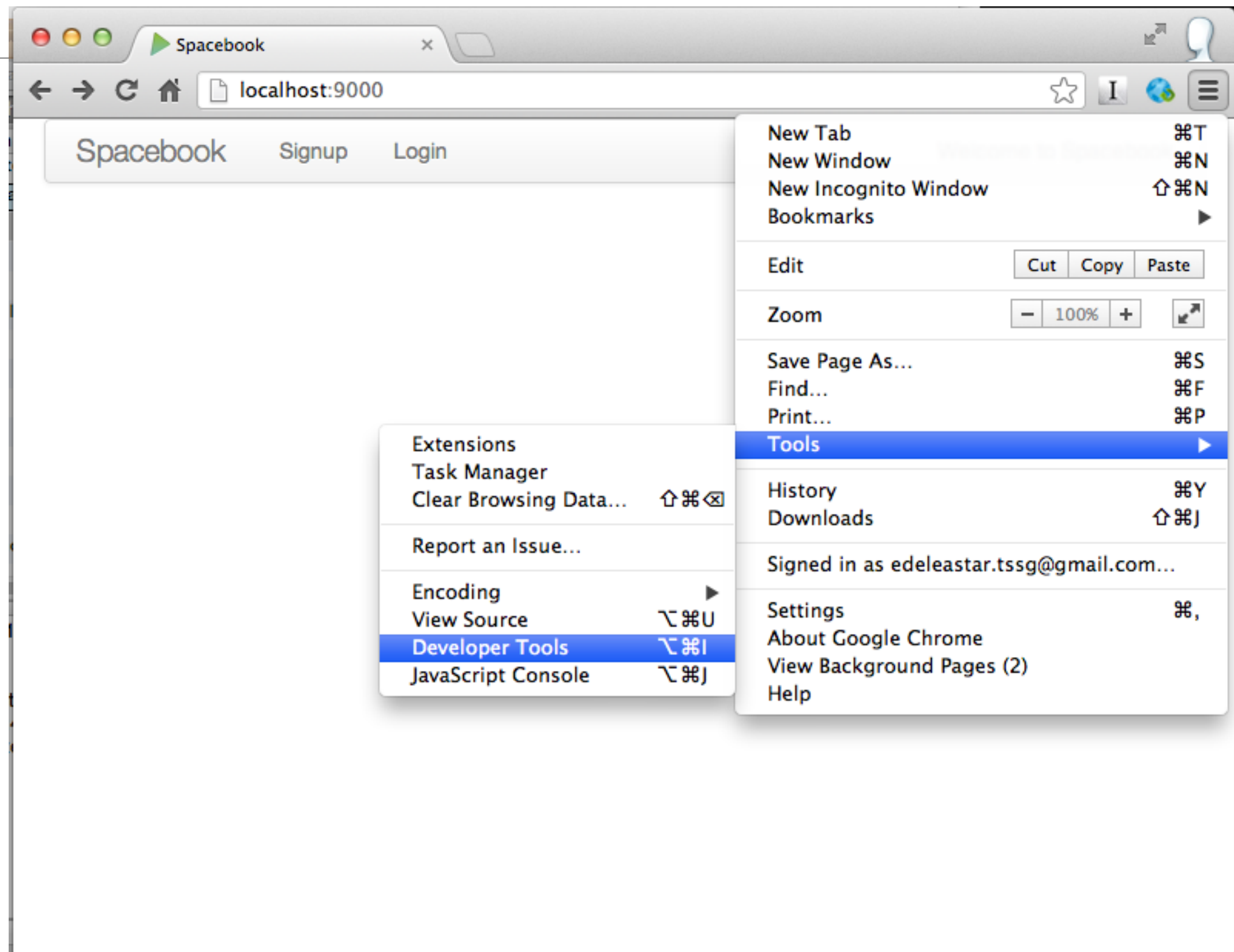


Tracing the HTTP messages in a Web App

Spacebook-3 - Standard Chrome Browser



Tools-Developer tools menu option...



Spacebook

localhost:9000

☆ I 🌐 ☰

Spacebook Signup Login Welcome to Spacebook

✕ Elements

Resources

Network

Sources

Timeline

Profiles

Audits

Console

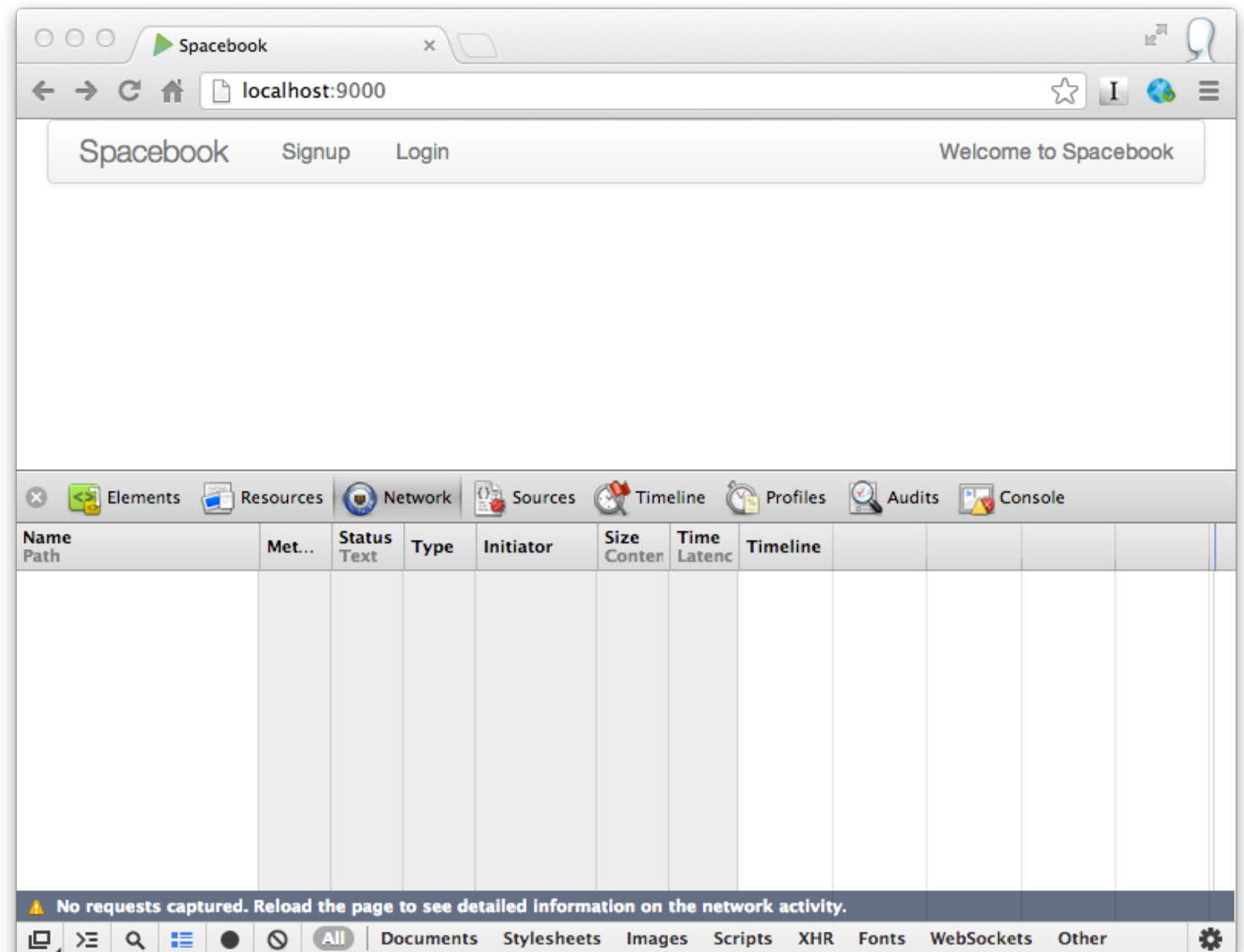
Name Path	Met...	Status Text	Type	Initiator	Size Conter	Time Latenc	Timeline					
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⚠️ No requests captured. Reload the page to see detailed information on the network activity.

>≡ 🔍 📄 ● 🚫 All Documents Stylesheets Images Scripts XHR Fonts WebSockets Other ⚙️

Tracing HTTP Request/Response

- Operate Browser as normal
- Control panel shows considerable range of diagnostic information, including:
 - Html
 - CSS
 - Javascript
 - Network traces
 - + much more....



Simple Trace Example

- Run spacebook from localhost:9000 as usual.

- “Network” activity shows requests/responses....

The screenshot shows a web browser window with the address bar set to `localhost:9000`. The page title is "Spacebook" and the URL is `localhost:9000`. The page content includes a header with "Spacebook", "Signup", and "Login" links, and a "Welcome to Spacebook" message. Below the header, the page is mostly blank.

The browser's developer tools are open, showing the "Network" tab. The table below lists the network activity:

Name Path	Met...	Status Text	Type	Initiator	Size Content	Time Latenc	Timeline	26ms	39ms	52ms	65ms
localhost	GET	200 OK	text/...	Other	902B 555B	22ms 22ms					
bootstrap.min.css /public/bootstrap/cs:	GET	304 Not Mo	text/...	localhost:5 Parser	124B 98.89K	2ms 2ms					

The bottom status bar of the developer tools shows: "2 requests | 1.00KB transferred | 63ms (onload: 65ms, DOMContentLoaded: 61ms)".

http://localhost:9000 - Request

- This is the actual text sent across the wire:

```
GET /login HTTP/1.1
Host: localhost:9000
Connection: keep-alive
Cache-Control: max-age=0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_8_2) AppleWebKit/537.17
(KHTML, like Gecko) Chrome/24.0.1312.56 Safari/537.17
Accept-Encoding: gzip,deflate,sdch
Accept-Language: en-US,en;q=0.8
Accept-Charset: ISO-8859-1,utf-8;q=0.7,*;q=0.3
```


http://localhost:9000 - Response

- This is the actual text sent back from the server....
- Response is '200 ok' + the html for the page

```
HTTP/1.1 200 OK
Server: Play! Framework;1.2.4;dev
Content-Type: text/html; charset=utf-8
Set-Cookie: PLAY_FLASH=;Expires=Mon, 28-Jan-13 17:16:23 GMT;Path=/
Set-Cookie: PLAY_ERRORS=;Expires=Mon, 28-Jan-13 17:16:23 GMT;Path=/
Set-Cookie: PLAY_SESSION=;Expires=Mon, 28-Jan-13 17:16:23 GMT;Path=/
Cache-Control: no-cache
Content-Length: 876

!DOCTYPE html>
<html>
  <head>
    <title> Spacebook </title>
    <link rel="stylesheet" media="screen" href="/public/bootstrap/css/
bootstrap.min.css">
  </head>
  <body>
    <div class="container-fluid">
      <div class="navbar ">
        <div class="navbar-inner">
          <a class="brand pull-left" href="#">Spacebook</a>
          <ul class="nav">
            <li>          <a href="/signup"> Signup  </a></li>
            <li class="active">  <a href="/login"> Login    </a></li>
          </ul>
          <p class="navbar-text pull-right"> Login to Spacebook </p>
        </div>
      </div>
      <form id="login" action="/authenticate" method="POST">
        <label>Email</label>
        <input type="text" name="email" id="email" />

        <label>Password</label>
        <input type="password" name="password" id="password" />

        <input class="formbutton" type="submit" value="Login" />
      </form>
    </div>
  </body>
</html>
```

Developer Tools - http://localhost:9000/login

Elements Resources Network Sources Timeline Profiles Audits Console

Name Path

- login
- bootstrap.min.css /public/bootstrap/css

Headers Preview Response Cookies Timing

Request URL: http://localhost:9000/login
Request Method: GET
Status Code: 200 OK

▼ Request Headers [view source](#)

Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Charset: ISO-8859-1,utf-8;q=0.7,*;q=0.3
Accept-Encoding: gzip,deflate,sdch
Accept-Language: en-US,en;q=0.8
Cache-Control: max-age=0
Connection: keep-alive
Host: localhost:9000
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_8_2) AppleWebKit/537.17 (KHTML, like Gecko) Chrome/24.0.1312.56 Safari/537.17

▼ Response Headers [view source](#)

Cache-Control: no-cache
Content-Length: 876
Content-Type: text/html; charset=utf-8
Server: Play! Framework;1.2.4;dev
Set-Cookie: PLAY_FLASH=;Expires=Mon, 28-Jan-13 17:16:23 GMT;Path=/
Set-Cookie: PLAY_ERRORS=;Expires=Mon, 28-Jan-13 17:16:23 GMT;Path=/
Set-Cookie: PLAY_SESSION=;Expires=Mon, 28-Jan-13 17:16:23 GMT;Path=/

2 requests | 1.32KB transferred

All Documents Stylesheets Images Scripts XHR Fonts WebSockets Other

- View Source

Developer Tools View of request/response

The screenshot shows the Chrome Developer Tools interface with the Network tab selected. The top toolbar includes icons for Elements, Resources, Network, Sources, Timeline, Profiles, Audits, and Console. The main panel displays a list of network requests on the left and the details of the selected request on the right.

Network Tab Details:

- Name Path:** login, bootstrap.min.css /public/bootstrap/css
- Request URL:** http://localhost:9000/login
- Request Method:** GET
- Status Code:** 200 OK
- Request Headers:**
 - GET /login HTTP/1.1
 - Host: localhost:9000
 - Connection: keep-alive
 - Cache-Control: max-age=0
 - Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
 - User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_8_2) AppleWebKit/537.17 (KHTML, like Gecko) Chrome/24.0.1312.56 Safari/537.17
 - Accept-Encoding: gzip, deflate, sdch
 - Accept-Language: en-US,en;q=0.8
 - Accept-Charset: ISO-8859-1,utf-8;q=0.7,*;q=0.3
- Response Headers:**
 - HTTP/1.1 200 OK
 - Server: Play! Framework;1.2.4;dev
 - Content-Type: text/html; charset=utf-8
 - Set-Cookie: PLAY_FLASH=;Expires=Mon, 28-Jan-13 17:16:23 GMT;Path=/
 - Set-Cookie: PLAY_ERRORS=;Expires=Mon, 28-Jan-13 17:16:23 GMT;Path=/
 - Set-Cookie: PLAY_SESSION=;Expires=Mon, 28-Jan-13 17:16:23 GMT;Path=/
 - Cache-Control: no-cache
 - Content-Length: 876

Bottom Bar: 2 requests | 1.32KB transferred

Bottom Panel: All | Documents | Stylesheets | Images | Scripts | XHR | Fonts | WebSockets | Other

Developer Tools - http://localhost:9000/login

×

Elements

Resources

Network

Sources

Timeline

Profiles

Audits

Console

Name

Path

login

bootstrap.min.css

/public/bootstrap/css

×

Headers

Preview

Response

Cookies

Timing

```

1 <!DOCTYPE html>
2 <html>
3   <head>
4     <title> Spacebook </title>
5     <link rel="stylesheet" media="screen" href="/public/bootstrap/css/bootstrap.min.cs
6   </head>
7   <body>
8     <div class="container-fluid">
9
10
11
12     <div class="navbar ">
13       <div class="navbar-inner">
14         <a class="brand pull-left" href="#">Spacebook</a>
15         <ul class="nav">
16           <li>         <a href="/signup"> Signup   </a></li>
17           <li class="active"> <a href="/login">  Login    </a></li>
18         </ul>
19         <p class="navbar-text pull-right"> Login to Spacebook </p>
20       </div>
21     </div>
22
23
24     <form id="login" action="/authenticate" method="POST">
25       <label>Email</label>
26       <input type="text" name="email" id="email" />
27
28       <label>Password</label>
29       <input type="password" name="password" id="password" />
30
31       <input class="formbutton" type="submit" value="Login" />
32     </form>
33   </div>
34 </body>
35 </html>

```

2 requests | 1.32KB transferred

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All

Documents

Stylesheets

Images

Scripts

XHR

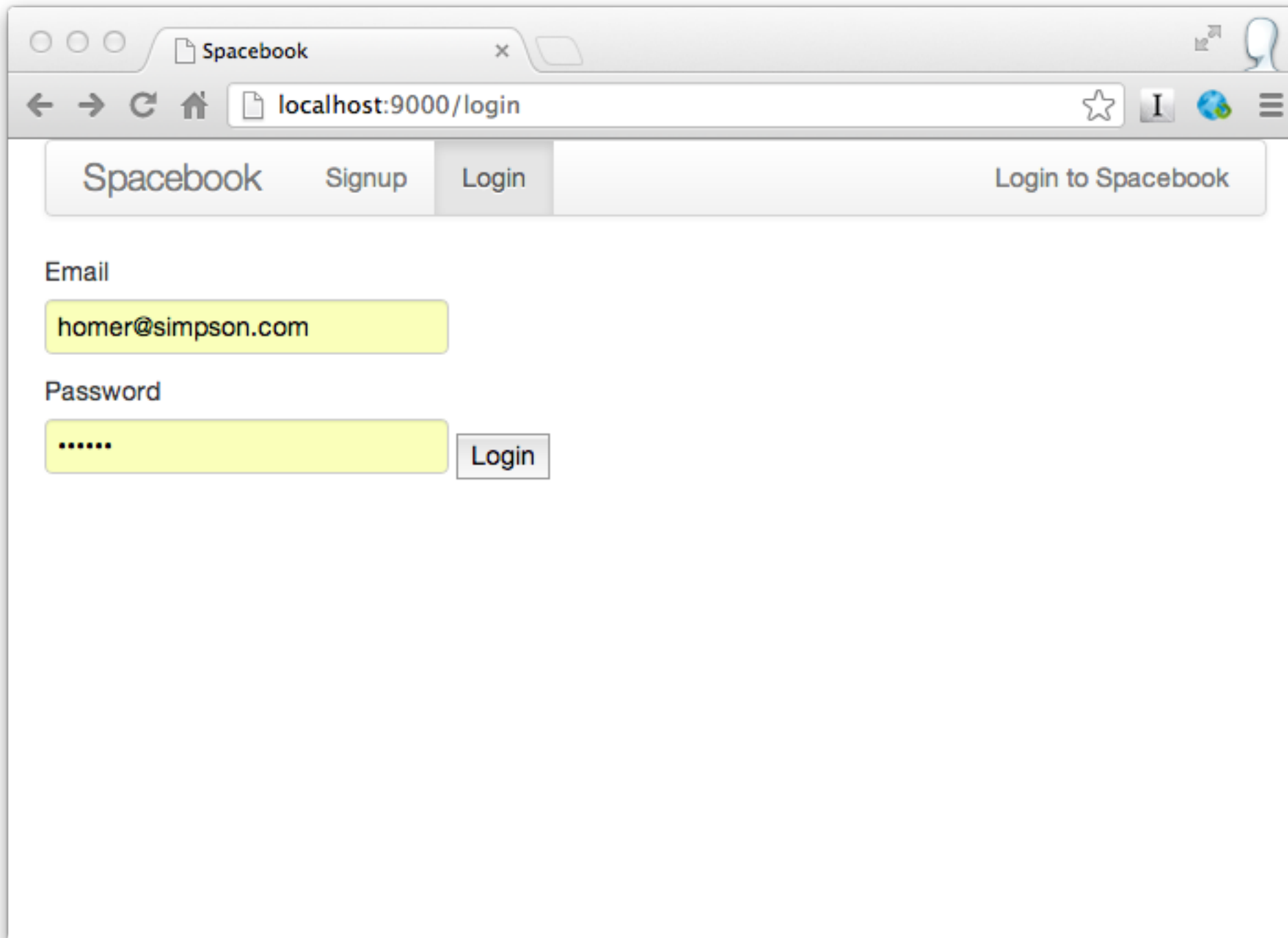
Fonts

WebSockets

Other

⚙️

Try Submitting a Form...



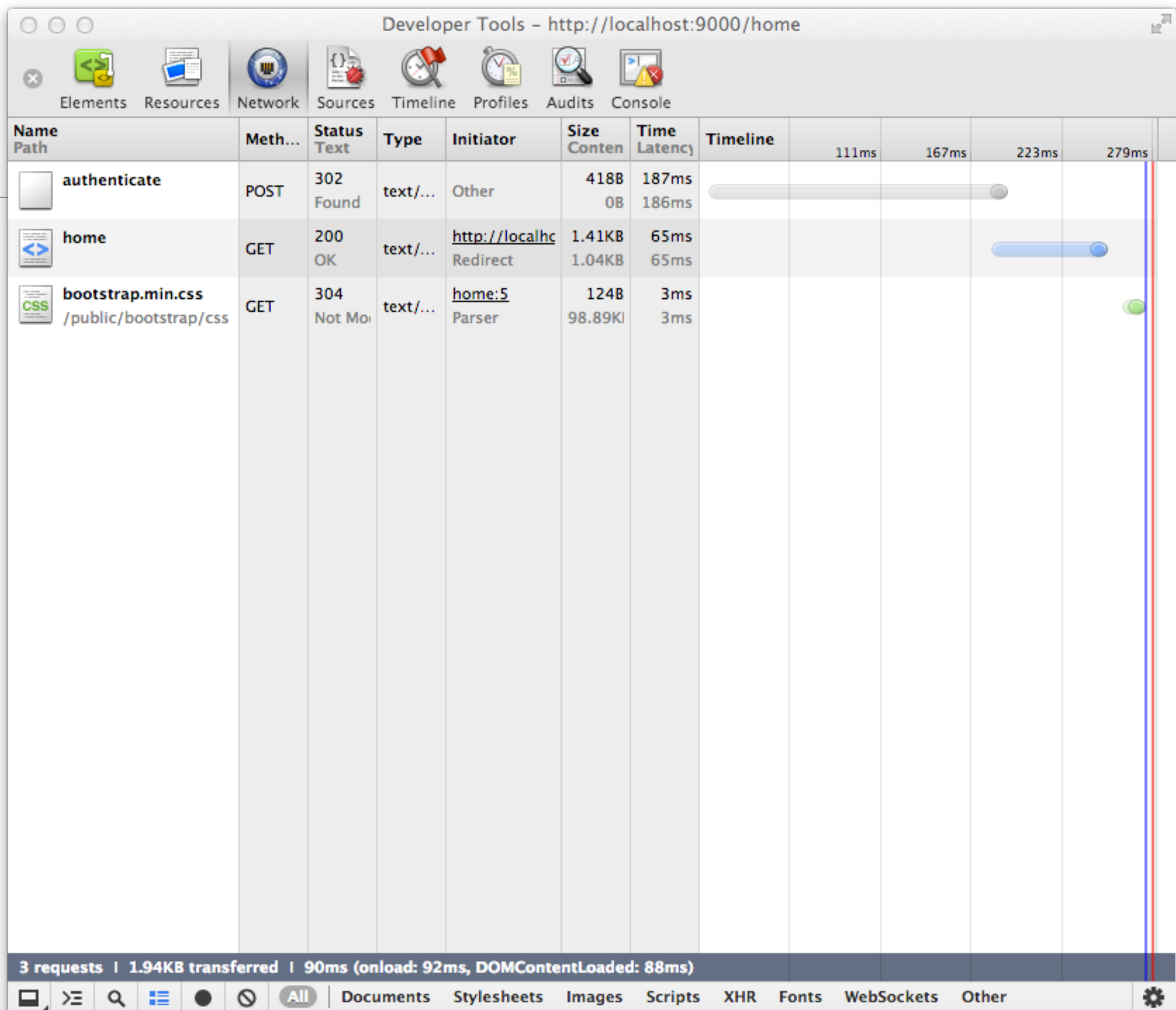
A screenshot of a web browser window. The browser's address bar shows 'localhost:9000/login'. The page has a header with 'Spacebook', 'Signup', and 'Login' links, and a 'Login to Spacebook' button. Below the header, there is a form with two input fields: 'Email' containing 'homer@simpson.com' and 'Password' containing six dots. A 'Login' button is positioned to the right of the password field.

Spacebook Signup Login Login to Spacebook

Email
homer@simpson.com

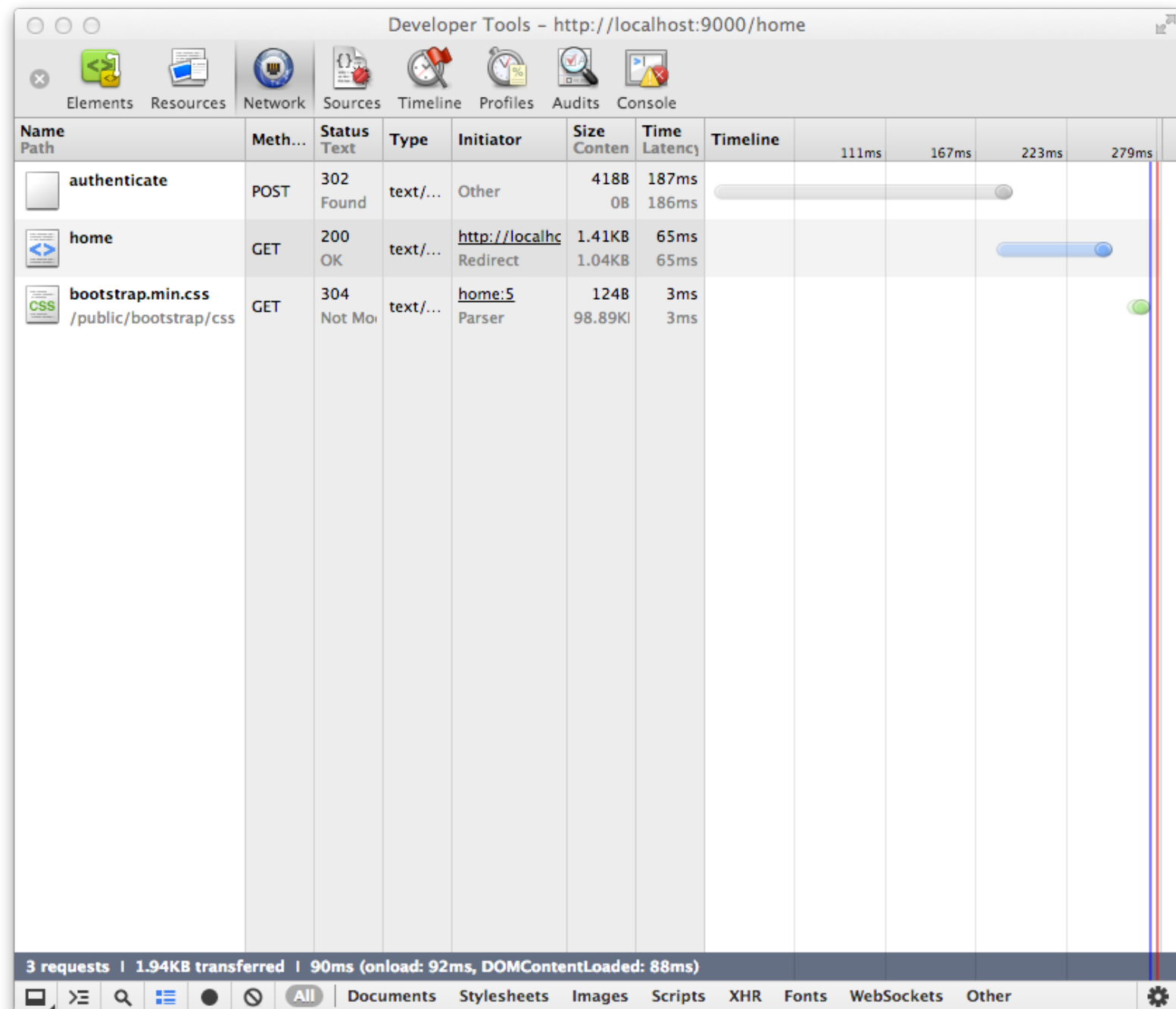
Password
..... Login

- When we press the button, we are generating a request...


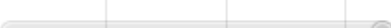

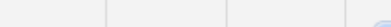




3 Requests?

- First one is ok - this is the 'Action' from the form
- What about the other two?



The screenshot shows the Chrome Developer Tools Network tab for the URL `http://localhost:9000/home`. The table below represents the data shown in the table view of the Network tab.

Name Path	Meth...	Status Text	Type	Initiator	Size Conten	Time Latency	Timeline
 authenticate	POST	302 Found	text/...	Other	418B 0B	187ms 186ms	
 home	GET	200 OK	text/...	http://localhc Redirect	1.41KB 1.04KB	65ms 65ms	
 bootstrap.min.css <code>/public/bootstrap/css</code>	GET	304 Not Mo	text/...	home:5 Parser	124B 98.89Kl	3ms 3ms	

3 requests | 1.94KB transferred | 90ms (onload: 92ms, DOMContentLoaded: 88ms)

Navigation: All Documents Stylesheets Images Scripts XHR Fonts WebSockets Other

/authenticate Request

```
POST /authenticate HTTP/1.1
Host: localhost:9000
Connection: keep-alive
Content-Length: 41
Cache-Control: max-age=0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Origin: http://localhost:9000
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_8_2) AppleWebKit/537.17
(KHTML, like Gecko) Chrome/24.0.1312.56 Safari/537.17
Content-Type: application/x-www-form-urlencoded
Referer: http://localhost:9000/login
Accept-Encoding: gzip,deflate,sdch
Accept-Language: en-US,en;q=0.8
Accept-Charset: ISO-8859-1,utf-8;q=0.7,*;q=0.3
Cookie: PLAY_SESSION=08b5765778d75b6fbee191f2a44c8368e25f62e4-
%00logged_in_userid%3A1%00
email=homer%40simpson.com&password=secret
```


/authenticate Request - form data

```
POST /authenticate HTTP/1.1
Host: localhost:9000

...

email=homer%40simpson.com&password=secret
```

- Request encapsulate 'form data' as a single string, separated by '&'s

/authenticate - Response

```
HTTP/1.1 302 Found
Server: Play! Framework;1.2.4;dev
Content-Type: text/plain; charset=utf-8
Location: http://localhost:9000/home
Set-Cookie: PLAY_FLASH=;Expires=Mon, 28-Jan-13 17:28:55 GMT;Path=/
Set-Cookie: PLAY_ERRORS=;Expires=Mon, 28-Jan-13 17:28:55 GMT;Path=/
Set-Cookie: PLAY_SESSION=08b5765778d75b6fbee191f2a44c8368e25f62e4-
%00logged_in_userid%3A1%00;Path=/
Cache-Control: no-cache
Content-Length: 0
```

- Response with '302 Found' (previous response was '200 ok')
- '302 Found' means the requested resource is present - but at another location.
- This is provided as 'Location: <http://localhost:9000/home>
- Once a browser sees this response - it make a second request to this new location...

/home request

```
GET /home HTTP/1.1
Host: localhost:9000
Connection: keep-alive
Cache-Control: max-age=0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_8_2) AppleWebKit/
537.17 (KHTML, like Gecko) Chrome/24.0.1312.56 Safari/537.17
Referer: http://localhost:9000/login
Accept-Encoding: gzip,deflate,sdch
Accept-Language: en-US,en;q=0.8
Accept-Charset: ISO-8859-1,utf-8;q=0.7,*;q=0.3
Cookie: PLAY_SESSION=08b5765778d75b6fbee191f2a44c8368e25f62e4-
%00logged_in_userid%3A1%00
```

- Notice the 'logged_in_userid' field... remember that?
- What is its purpose?

HTTP/1.1 200 OK Server: Play! Framework;1.2.4;dev Content-Type: text/html; charset=utf-8 Set-Cookie: PLAY_FLASH=;Expires=Mon, 28-Jan-13 17:28:55 GMT;Path=/ Set-Cookie: PLAY_ERRORS=;Expires=Mon, 28-Jan-13 17:28:55 GMT;Path=/ Set-Cookie: PLAY_SESSION=08b5765778d75b6fbee191f2a44c8368e25f62e4-%00logged_in_userid%3A1%00;Path=/ Cache-Control: no-cache Content-Length: 1067 <!DOCTYPE html> <html> <head> <title> Spacebook </title> <link rel="stylesheet" media="screen" href="/public/bootstrap/css/bootstrap.min.css"> </head> <body> <div class="container-fluid"> <div class="navbar "> <div class="navbar-inner"> Spacebook <ul class="nav"> <li class="active"> Home Members Profile Logout <p class="navbar-text pull-right"> Spacebook Home Page for Homer Simpson </p> </div> </div> <div class="row-fluid"> <div class="span4"> <p> Homer Simpson, 0, </p> <h2> Friends </h2> <h2> Following (0) </h2> <h4> Followers </h4> </div> <div class="span8"> <h2> Messages </h2> </div> </div> </div> </body> </html>	<h1>/home response</h1>
---	-------------------------

- This is a '200 ok' delivering to us the 'home' page...
- Which in turn requests the css file

Developer Tools - http://localhost:9000/home

Elements
 Resources
 Network
 Sources
 Timeline
 Profiles
 Audits
 Console

Name Path	Method	Status Text	Type	Initiator	Size Content	Time Latenc	Timeline
authenticate	POST	302 Found	text/plain	Other	418B 0B	187ms 186ms	
home	GET	200 OK	text/html	http://localhost:9000/authenticate Redirect	1.41KB 1.04KB	65ms 65ms	
bootstrap.min.css /public/bootstrap/c	GET	304 Not Modifi	text/css	home:5 Parser	124B 98.89KB	3ms 3ms	





3 requests | 1.94KB transferred | 90ms (onload: 92ms, DOMContentLoaded: 88ms)

All
 Documents
 Stylesheets
 Images
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 XHR
 Fonts
 WebSockets
 Other

Visiting the Members Page

Developer Tools - http://localhost:9000/members

Elements Resources Network Sources Timeline Profiles Audits Console

Name Path	Met...	Status Text	Type	Initiator	Size Contei	Time Latenc	Timeline	413ms	620ms	826ms
 members	GET	200 OK	text...	Other	1.63KE 1.26KE	800ms 799ms				
 bootstrap.min.css /public/bootstrap/c	GET	304 Not Modified	text...	members:5 Parser	124B 98.89k	2ms 2ms				








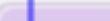
2 requests | 1.75KB transferred | 822ms (onload: 826ms, DOMContentLoaded: 820ms)

All Documents Stylesheets Images Scripts XHR Fonts WebSockets Other

Visiting the Home Profile

Developer Tools - http://localhost:9000/homeprofile

Elements Resources Network Sources Timeline Profiles Audits Console

Name Path	Met...	Status Text	Type	Initiator	Size Content	Time Latenc	Timeline	1.95s	2.92s
 homeprofile	GET	200 OK	text/html	Other	2.14KB 1.77KB	2.18s 2.15s			
 bootstrap.min.css /public/bootstrap/c	GET	304 Not Moc	text/css	<u>homeprofile:5</u> Parser	124B 98.89KB	24ms 3ms			
 1 /homeprofile/getpic	GET	200 OK	image/jpeg	<u>homeprofile:24</u> Parser	1.52MB 1.52MB	397ms 321ms			
 1 /homeprofile/getthu	GET	200 OK	image/jpeg	<u>homeprofile:31</u> Parser	838.85KB 838.46KB	676ms 672ms			







4 requests | 2.34MB transferred | 2.88s (onload: 2.92s, DOMContentLoaded: 2.20s)

☐ >≡ 🔍 ☰ ● ⌛ All Documents Stylesheets Images Scripts XHR Fonts WebSockets Other ⚙

Logging out

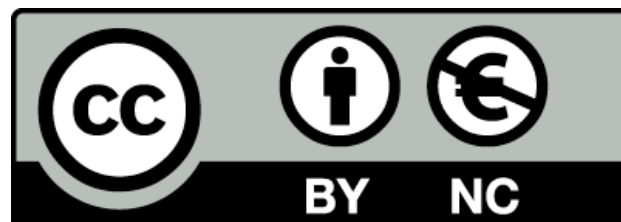
Developer Tools - http://localhost:9000/

Elements Resources Network Sources Timeline Profiles Audits Console

Name Path	Met...	Status Text	Type	Initiator	Size Contei	Time Latenc	Timeline	92ms	138ms	183ms	229ms
 logout	GET	302 Found	text...	Other	383B 0B	199ms 198ms					
 localhost	GET	200 OK	text...	http://localh Redirect	902B 555B	6ms 5ms					
 bootstrap.min.css /public/bootstrap/c	GET	304 Not Mo	text...	localhost:5 Parser	124B 98.89k	2ms 2ms					

3 requests | 1.38KB transferred | 29ms (onload: 30ms, DOMContentLoaded: 27ms)

All Documents Stylesheets Images Scripts XHR Fonts WebSockets Other



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