CS601

Cookies.
Session Tracking.

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Announcements

- Lab 6 is out
- Code Reviews for Lab 5 (today and Friday)
  - Sign up for a 10 min slot
  - If not able to explain something in the regex within their time slot – will get a 0
- Advising Session:
  - Monday, Oct 30, 11am, LS 307
  - Attendance strongly recommended

Cookie

- A small text file
- Sent by server to the client
- Is stored by the browser on the user's machine
- Sent to the server on each request
- The server can use cookie as a key to retrieve data for that user

Cookies
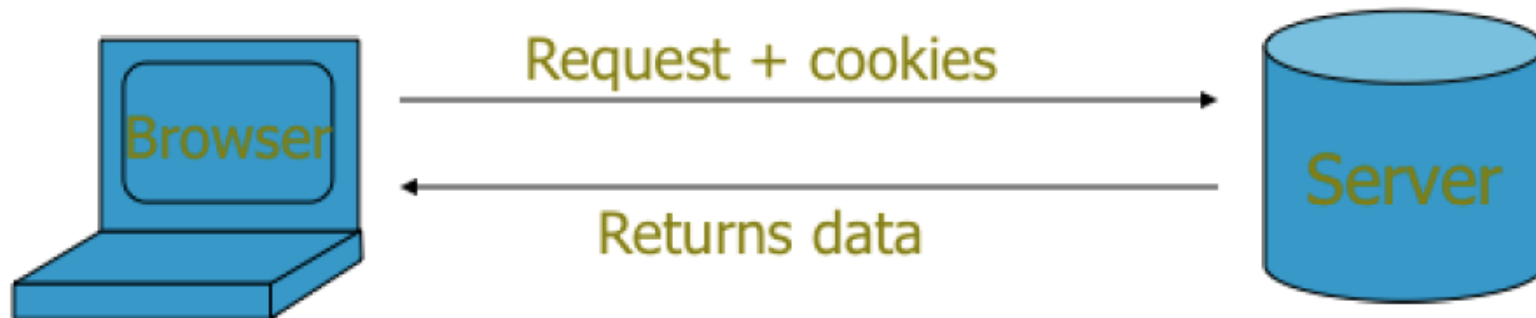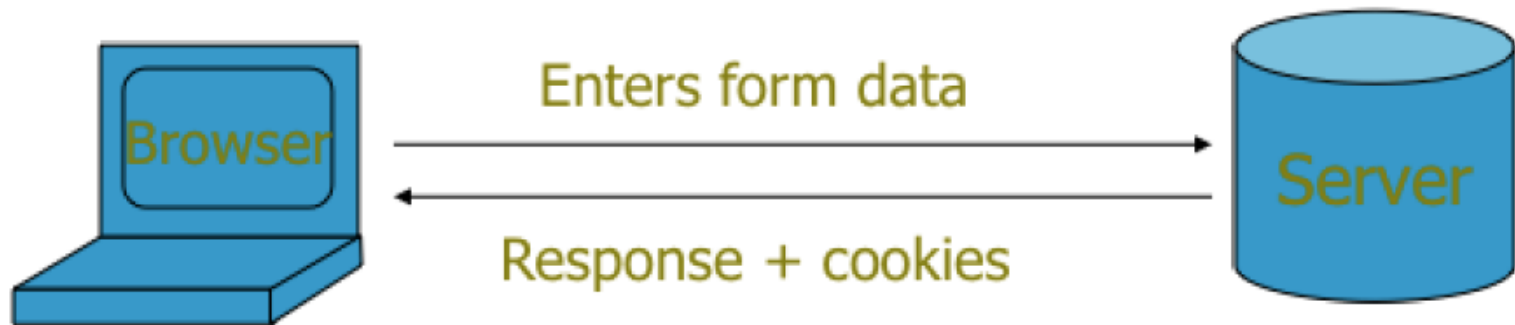
Cookies

- Web browser stores the total of ~300 cookies
- ~20-50 per domain
- Each cookie <= 4 KB
- Clients may disable cookies

Cookie Attributes

- Name
- Value
- Domain and path
- Expiration date

Example

– Name session-token

– Content "s7yZiOvFm4YymG…."

– Domain amazon.com

– Path /

– Expires Monday, September 08, 2031 7:19:41 PM

How are Cookies Passed in HTTP?

- The server sends cookies in the header of the response:
  `Set-Cookie:name=value[; expires=date]`
  `[; domain=domain][; path=path][; secure]`

- The browser sends cookies in the header of the request:
  `Cookie:name=value`

Example: amazon.com

- The server sends cookies in the header of the response:
  `Set-Cookie=session-id=124-2999-8223305; path=/; domain=.amazon.com; expires=Tue, 01-Jan-2036 08:00:01 GMT`

- The browser sends cookies in the header of the request:
  `Cookie=session-id=124-2999-8223305`

https://github.com/parrt/cs601/blob/master/lectures/cookies.md

Cookies and Privacy

- Store personal information
  - Used to track user activities
  - Long-term records of individuals' browsing histories
- Example:
  - advertising companies use third-party cookies to track a user across multiple sites

Third-party Cookies

- Set by a website different than the one you are currently on
  - Ex: cnn.com might have a facebook button, so facebook button will set a cookie and Facebook can read it
- Can be used to track your activity across multiple sites
- Can be blocked

Servlet Cookies

- Create a cookie:

```
Cookie cookie = new Cookie("name", "value");
cookie.setMaxAge(60*60*24*365);
response.addCookie(cookie);
```

- Get the cookies from the client

```
Cookie[] cookies = request.getCookies();
// need to search for the correct cookie
```

Example

- Keep track of the number of visits & the date of the last visit for a particular user

- Use cookies

- See CookieServer, CookieBaseServlet, CookieVisitServlet, CookieConfigServlet

Session Tracking

- HTTP is a stateless protocol
  - The current request does not know what has been done in the previous requests
- Problem: some applications run over multiple requests
  - Need to maintain a session to pass data between requests

Session Tracking: Approaches

- Use cookie
  - Store session data inside the cookie
- URL Rewriting
  - Append a string to the URL

  http://host/path/file.html;jsessionid=123456

- Hidden field in an HTML form

  <input type="hidden" name="sessionId" value="123456" />

Example: amazon.com

- The server sends cookies in the header of the response:
  `Set-Cookie=session-id=124-2999-8223305; path=/; domain=.amazon.com; expires=Tue, 01-Jan-2036 08:00:01 GMT`

- The browser sends cookies in the header of the request:
  `Cookie=session-id=124-2999-8223305`

Session Tracking

- Previous approaches – tedious
- HttpSession class:
  - Access information about a session
  - Bind objects to sessions
    - User information persists across multiple user requests

Session Tracking: javax.servlet.http.HttpSession

- Login page:
```
HttpSession session = request.getSession();
session.setAttribute("username", username);
```

- Other Pages:
```
if(session.getAttribute("username") ==null)
{
    //forward to login page
}
```

https://www3.ntu.edu.sg/home/ehchua/programming/java/JavaServlets.html

Session Tracking: javax.servlet.http.HttpSession

- session.getId()
- session.getCreationTime()
- session.getLastAccessedTime()
- session.getMaxInactiveInterval()
- session.getAttribute("username")
- session.setAttribute("username", name)

https://www3.ntu.edu.sg/home/ehchua/programming/java/JavaServlets.html

Example

- See SessionServer, SessionServlet