# Q1：

LoginServlet.java

1.

change

"<input type=\"submit\" value=\"Sign in\" />\n"

to

"<input type=\"submit\" value=\"Sign in\" onclick=\"handleLogin()\" />\n"

2.

add

"document.querySelector(\"input[type=submit]\").addEventListener(\"click\", " +

"handleLogin);\n" +

into

"<script>"

...

"</script>"

3.

change

"<form action=\"login\" method=\"POST\">\n"

to

"<form action=\"login\" method=\"POST\" onsubmit=\"handleLogin()\">\n"

# Q2:

MainServlet.java

change

HttpSession session = *request*.getSession(false);

if(session == null)

{

*response*.setStatus(302);

*response*.sendRedirect("login");

}

to

HttpSession session = *request*.getSession(false);

if(session == null)

{

*response*.sendRedirect("login");

return;

}

*String* action = *request*.getParameter("action");

if(action != null)

{

switch(action)

{

case "UPLOAD":

*response*.sendRedirect("upload");

return;

case "PLAY GALLERY":

*response*.sendRedirect("play");

return;

case "LOGOUT":

*response*.sendRedirect("logout");

return;

}

}

change

*String* html = docType + "<html>\n" + "<head><title>" + title + "</title></head>\n"

+ "<body bgcolor=\"#f0f0f0\">\n" + "<h1 align=\"center\">" + title +

"</h1>\n" +

"<div style=\"text-align: center;\">\n" +

"<form action=\"upload\" method=\"GET\">\n" +

"<input type=\"submit\" value=\"UPLOAD\" />\n" +

"</form>\n" +

"</div>\n" +

"<div style=\"text-align: center;\">\n" +

"<form action=\"play\" method=\"GET\">\n" +

"<input type=\"submit\" value=\"GALLERY\" />\n" +

"</form>\n" +

"</div>\n" +

"<div style=\"text-align: center;\">\n" +

"<form action=\"logout\" method=\"GET\">\n" +

"<input type=\"submit\" value=\"LOGOUT\" />\n" +

"</form>\n" +

"</div>\n" + "</body></html>";

to

*String* html = docType + "<html>\n"

+ "<head><title>" + title + "</title></head>\n"

+ "<body bgcolor=\"#f0f0f0\">\n"

+ "<h1 align=\"center\">" + title + "</h1>\n"

+ "<div style=\"text-align: center;\">\n"

+ " <form action=\"main\" method=\"GET\">\n"

+ " <input type=\"submit\" name=\"action\" value=\"UPLOAD\" />\n"

+ " <input type=\"submit\" name=\"action\" value=\"PLAY GALLERY\" />\n"

+ " <input type=\"submit\" name=\"action\" value=\"LOGOUT\" />\n"

+ " </form>\n"

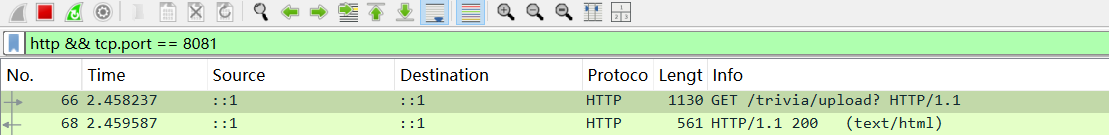
+ "</div>\n"

+ "</body></html>";

In the original implementation, navigation is done through three separate forms. Each form has its own action attribute, so when the user clicks a button, the browser sends a single HTTP request directly to the corresponding servlet.

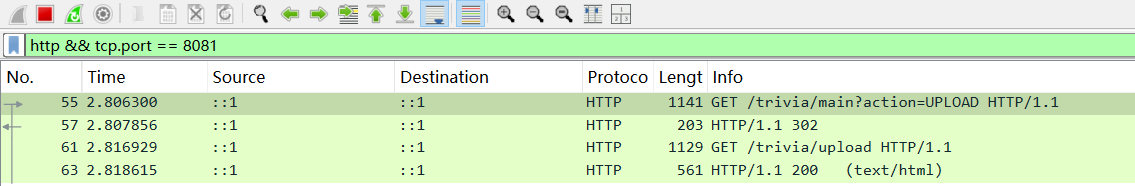
In the revised implementation, there is only one form with multiple submit buttons. No matter which button is pressed, the request is first sent to MainServlet with an extra parameter action. MainServlet reads it and then redirects to the corresponding servlet, which requires one more HTTP round-trip.

Original:



One request directly to /upload and a 200 OK response.

Revised:



First request to /main?action=UPLOAD, server responds with 302 Found, then the browser follows the redirect and

# Q3

## a.

LoginServlet.java

add

private static final *String* DB\_URL =

"jdbc:mysql://localhost:3306/testdb?useSSL=false&serverTimezone=UTC";

private static final *String* DB\_USER = "root";

private static final *String* DB\_PASS = "YOUR\_PASSWORD";

change *doPost*() to

public void *doPost*(*HttpServletRequest request*, *HttpServletResponse response*)

throws *ServletException*, *IOException*

{

*request*.*setCharacterEncoding*("UTF-8");

*String* username = *request*.*getParameter*("user\_id");

*String* password = *request*.*getParameter*("password");

boolean ok = false;

try(*Connection* conn = *DriverManager*.*getConnection*(JDBC\_URL, JDBC\_USER, JDBC\_PASS);

*PreparedStatement* ps = conn.*prepareStatement*(

"SELECT 1 FROM accounts WHERE username=? AND password=?"))

{

ps.*setString*(1, username);

ps.*setString*(2, password);

try(*ResultSet* rs = ps.*executeQuery*())

{

ok = rs.*next*();

}

} catch(*SQLException e*)

{

ok = false;

}

if(ok)

{

*HttpSession* session = *request*.*getSession*(true);

session.*setAttribute*("USER\_ID", username);

*response*.*sendRedirect*("main");

} else

{

*response*.*sendRedirect*("login?err=1");

}

}

## b.

PlayServlet.java

add

private static final *String* JDBC\_URL =

"jdbc:mysql://localhost:3306/testdb?useSSL=false&serverTimezone=UTC";

private static final *String* JDBC\_USER = "root";

private static final *String* JDBC\_PASS = "YOUR\_PASSWORD";

change *doGet*()to

public void *doGet*(*HttpServletRequest request*, *HttpServletResponse response*)

throws *ServletException*, *IOException*

{

*response*.*setContentType*("text/html; charset=UTF-8");

*HttpSession* session = *request*.*getSession*(true);

*// Use session to record current video index (0-based)*

*Integer* idx = (*Integer*) session.*getAttribute*("VID\_IDX");

if(idx == null)

{

idx = 0;

}

*// Move index based on button click*

if(*request*.*getParameter*("prev") != null && idx > 0)

{

idx--;

} else if(*request*.*getParameter*("next") != null)

{

idx++;

}

*// Get video URL from database*

*String* videoUrl = null;

try(*Connection* con = *DriverManager*.*getConnection*(JDBC\_URL, JDBC\_USER, JDBC\_PASS))

{

try(*PreparedStatement* ps = con.*prepareStatement*(

"SELECT url FROM videos ORDER BY id LIMIT 1 OFFSET ?"))

{

ps.*setInt*(1, idx);

try(*ResultSet* rs = ps.*executeQuery*())

{

if(rs.*next*())

{

videoUrl = rs.*getString*(1);

}

}

}

if(videoUrl == null)

{

idx = 0;

try(*PreparedStatement* ps0 = con.*prepareStatement*(

"SELECT url FROM videos ORDER BY id LIMIT 1 OFFSET 0");

*ResultSet* rs0 = ps0.*executeQuery*())

{

if(rs0.*next*())

{

videoUrl = rs0.*getString*(1);

}

}

}

} catch(*SQLException e*)

{

*// Never! Gonna! Give! You! Up!*

videoUrl = "https://youtu.be/dQw4w9WgXcQ?si=959xB4npzjgrNRtK";

}

session.*setAttribute*("VID\_IDX", idx);

*PrintWriter* out = *response*.*getWriter*();

out.*println*(

"<!DOCTYPE html>" +

"<html>" +

"<meta charset='UTF-8'>" +

"<body>" +

"<div>" +

"<iframe id=\"Video\" width=\"420\" height=\"345\" " +

"src=" + videoUrl +

">" +

"</iframe>" +

"</div>" +

"<div>" +

"<form action='/trivia/play' method='GET'>" +

"<br>" +

"<div class='button'>" +

"<button class='button' id='prev' name='prev'>Prev</button>" +

"<button class='button' id='next' name='next'>Next</button>" +

"</div>" +

"<br>" +

"</form>" +

"<div>" +

"<form action='main' method='GET'>" +

"<button class='button' id='main'>Main</button>" +

"</form>" +

"</div>" +

"<br>" +

"</body>" +

"</html>"

);

}

# Q4

index.html

change

<button onclick="loadOne()">Show Image</button>

to

<img id="imgPreview" src="" width="420" height="345" style="display:none;">

<button onclick="loadOne()">Show Image</button>

, change function handleFileListing() to

function loadOne() {

var xhr = new XMLHttpRequest();

xhr.onreadystatechange = function () {

if (this.readyState === 4 && this.status === 200) {

var url = this.responseText.trim(); // 后端返回的图片绝对/相对路径

var img = document.getElementById("imgPreview");

img.src = url;

img.style.display = "block";

}

};

xhr.open("GET", "/triviaapi/trivia?op=one", true);

xhr.send();

}

Trivia.java

add

*String* op = *request*.*getParameter*("op");

if ("one".*equals*(op)) {

*// Get a image from the images directory*

*String* imagesDir = *getServletContext*().*getRealPath*("/images");

*File* dir = new *File*(imagesDir);

*String* url = "";

if (dir.*exists*() && dir.*isDirectory*()) {

*File*[] files = dir.*listFiles*();

if (files != null) {

for (*File* f : files) {

if (f.*isFile*() && !f.*isHidden*()) {

url = *request*.*getContextPath*() + "/images/" + f.*getName*();

break;

}

}

}

}

*// Return the image path*

*response*.*setContentType*("text/plain; charset=UTF-8");

*PrintWriter* out = *response*.*getWriter*();

out.*print*(url);

return;

}

after *System*.out.*println*(*request*.*getParameterMap*());

into *doGet*()