RESULT:

Thus the above experiment for Session Tracking for HTTP Session has been successfully installed and executed

Ex No: 7
Date:

COOKIE PREFERENCE

AIM :

To implement client-side state management using HTTP cookies in Java Servlets by creating a preference system that remembers user's theme and language choices across browser sessions.

ALGORITHM:

1. UI Design Phase

- Create a preferences page with:
- Theme selection (light/dark) radio buttons
- Language selection dropdown (EN/ES/FR)
- Save preferences button
- Design dynamic page that reflects current preferences

2. Cookie Creation Phase

- On form submission:
- Extract theme and language parameters
- Create new Cookie objects for each preference
- Set cookie properties:
- `maxAge` = 1 year (persistent cookie)
- `path` = "/" (accessible across entire app)
- Add cookies to HTTP response

3. Preference Retrieval Phase

- For every page request:
- Check request for existing cookies
- If cookies exist:
- Read 'theme' and 'language' values
- Apply preferences to current page
- If no cookies found:
- Use default values (dark theme, English)

4. Client-Side Enhancement

- Implement JavaScript to:
- Provide instant theme preview
- Show language change effects without reload
- Display save confirmation

5. Maintenance & Security

- Cookie validation checks
- Secure cookie attributes:
  - o `HttpOnly` flag
  - o SameSite policy
- Fallback mechanism for cookie-disabled browsers

CODE:

```html
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Neon Preferences</title>
    <style>
        :root {
            --neon-blue: #08f7fe;
            --neon-green: #09fbd3;
            --dark-bg: #0c0c15;
            --darker-bg: #07070e;
            --light-bg: #f5f5f5;
            --lighter-bg: #ffffff;
            --dark-text: #222;
```

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```css
        --glow: 0 0 10px;
    }

    body {
        background: var(--dark-bg);
        color: white;
        font-family: 'Segoe UI', Tahoma, Geneva, Verdana, sans-serif;
        margin: 0;
        padding: 20px;
        min-height: 100vh;
        display: flex;
        flex-direction: column;
        align-items: center;
        transition: all 0.5s ease;
        overflow-x: hidden;
    }

    body.light-theme {
        background: var(--light-bg);
        color: var(--dark-text);
    }

    .container {
        max-width: 800px;
        width: 90%;
        background: rgba(12, 12, 21, 0.8);
        border-radius: 15px;
        padding: 30px;
        box-shadow: 0 0 30px rgba(8, 247, 254, 0.2);
        border: 1px solid rgba(8, 247, 254, 0.3);
        backdrop-filter: blur(5px);
        position: relative;
        overflow: hidden;
        z-index: 1;
        animation: fadeIn 1s ease-out;
        transition: all 0.5s ease;
    }

    .light-theme .container {
        background: rgba(245, 245, 245, 0.9);
        border: 1px solid rgba(0, 0, 0, 0.1);
        box-shadow: 0 0 30px rgba(0, 0, 0, 0.1);
    }

    @keyframes fadeIn {
        from { opacity: 0; transform: translateY(20px); }
        to { opacity: 1; transform: translateY(0); }
    }

    h1 {
        color: var(--neon-blue);
```

```css
            text-align: center;
            font-size: 2.5rem;
            margin-bottom: 30px;
            text-shadow: var(--glow) var(--neon-blue);
            transition: all 0.5s ease;
        }

        .light-theme h1 {
            color: #0066cc;
            text-shadow: none;
        }

        .preference-card {
            background: rgba(7, 7, 14, 0.7);
            border-radius: 10px;
            padding: 20px;
            margin-bottom: 30px;
            border: 1px solid rgba(8, 247, 254, 0.2);
            transition: all 0.3s ease;
        }

        .light-theme .preference-card {
            background: rgba(255, 255, 255, 0.9);
            border: 1px solid rgba(0, 0, 0, 0.1);
        }

        h2 {
            color: var(--neon-green);
            margin-top: 0;
            font-size: 1.5rem;
            text-shadow: var(--glow) var(--neon-green);
            transition: all 0.5s ease;
        }

        .light-theme h2 {
            color: #009999;
            text-shadow: none;
        }

        .form-group {
            margin-bottom: 20px;
        }

        label {
            display: block;
            margin-bottom: 8px;
            color: var(--neon-blue);
            font-weight: bold;
            transition: all 0.5s ease;
        }
```

```css
.light-theme label {
    color: #0066cc;
}

select {
    width: 100%;
    padding: 12px;
    background: var(--darker-bg);
    border: 1px solid var(--neon-blue);
    border-radius: 5px;
    color: white;
    font-size: 1rem;
    transition: all 0.3s ease;
}

.light-theme select {
    background: var(--lighter-bg);
    border: 1px solid #0066cc;
    color: var(--dark-text);
}

select:focus {
    outline: none;
    border-color: var(--neon-green);
    box-shadow: 0 0 15px var(--neon-green);
}

.light-theme select:focus {
    border-color: #009999;
    box-shadow: 0 0 15px rgba(0, 153, 153, 0.5);
}

input[type="submit"] {
    width: 100%;
    padding: 12px;
    background: linear-gradient(45deg, var(--neon-blue), var(--neon-green));
    color: var(--dark-bg);
    font-weight: bold;
    cursor: pointer;
    border: none;
    border-radius: 5px;
    margin-top: 10px;
    text-transform: uppercase;
    letter-spacing: 1px;
    font-size: 1rem;
    transition: all 0.3s ease;
}

.light-theme input[type="submit"] {
    background: linear-gradient(45deg, #0066cc, #009999);
```

```css
            color: white;
        }

        input[type="submit"]:hover {
            transform: translateY(-2px);
            box-shadow: 0 5px 15px rgba(8, 247, 254, 0.4);
        }

        .light-theme input[type="submit"]:hover {
            box-shadow: 0 5px 15px rgba(0, 102, 204, 0.4);
        }

        .current-preferences {
            display: flex;
            gap: 20px;
            margin-bottom: 30px;
        }

        .preference-badge {
            flex: 1;
            padding: 15px;
            text-align: center;
            background: rgba(8, 247, 254, 0.1);
            border-radius: 8px;
            border: 1px solid var(--neon-blue);
            animation: float 4s ease-in-out infinite;
            transition: all 0.5s ease;
        }

        .light-theme .preference-badge {
            background: rgba(0, 102, 204, 0.1);
            border: 1px solid #0066cc;
        }

        .preference-badge:nth-child(2) {
            animation-delay: 0.5s;
            border-color: var(--neon-green);
            background: rgba(9, 251, 211, 0.1);
        }

        .light-theme .preference-badge:nth-child(2) {
            border-color: #009999;
            background: rgba(0, 153, 153, 0.1);
        }

        @keyframes float {
            0%, 100% { transform: translateY(0); }
            50% { transform: translateY(-10px); }
        }

        .preference-value {
```

```css
        font-size: 1.2rem;
        font-weight: bold;
        margin-top: 5px;
        color: var(--neon-green);
        transition: all 0.5s ease;
    }

    .light-theme .preference-value {
        color: #009999;
    }

    .theme-blue .preference-value {
        color: var(--neon-blue);
    }

    .light-theme .theme-blue .preference-value {
        color: #0066cc;
    }

    .home-link {
        display: inline-block;
        margin-top: 20px;
        color: var(--neon-blue);
        text-decoration: none;
        font-weight: bold;
        border: 1px solid var(--neon-blue);
        padding: 10px 20px;
        border-radius: 5px;
        transition: all 0.3s ease;
    }

    .light-theme .home-link {
        color: #0066cc;
        border: 1px solid #0066cc;
    }

    .home-link:hover {
        background: var(--neon-blue);
        color: var(--dark-bg);
        text-shadow: none;
        box-shadow: 0 0 15px var(--neon-blue);
    }

    .light-theme .home-link:hover {
        background: #0066cc;
        color: white;
        box-shadow: 0 0 15px #0066cc;
    }

    /* Language-specific styles */
    body[lang="es"] .language-example::after {
```

```
                content: "¡Hola!";
                color: var(--neon-green);
            }

            body[lang="fr"] .language-example::after {
                content: "Bonjour!";
                color: var(--neon-green);
            }

            body[lang="en"] .language-example::after {
                content: "Hello!";
                color: var(--neon-green);
            }

            .light-theme body[lang] .language-example::after {
                color: #009999;
            }
        </style>
    </head>
    <body class="${theme}-theme" lang="${language}">
        <div class="container">
            <h1>USER PREFERENCES</h1>

            <div class="current-preferences">
                <div class="preference-badge theme-blue">
                    <div>Current Theme</div>
                    <div class="preference-value">${theme}</div>
                </div>
                <div class="preference-badge">
                    <div>Current Language</div>
                    <div class="preference-value">${language}</div>
                </div>
            </div>

            <div class="language-example" style="text-align: center; margin: 20px
0; font-size: 1.2rem;">
                Example greeting: <span></span>
            </div>

            <div class="preference-card">
                <h2>SET YOUR PREFERENCES</h2>
                <form method="post" action="preferences">
                    <div class="form-group">
                        <label for="theme">Theme</label>
                        <select name="theme" id="theme" onchange="previewTheme()">
                            <option value="dark" ${"dark" == theme ? "selected" :
""}>Neon Dark Theme</option>
                            <option value="light" ${"light" == theme ? "selected"
: ""}>Light Theme</option>
                        </select>
                    </div>
```

```html
                    <div class="form-group">
                        <label for="language">Language</label>
                        <select name="language" id="language"
onchange="previewLanguage()">
                            <option value="en" ${"en" == language ? "selected" :
""}>English</option>
                            <option value="es" ${"es" == language ? "selected" :
""}>Spanish</option>
                            <option value="fr" ${"fr" == language ? "selected" :
""}>French</option>
                        </select>
                    </div>

                    <input type="submit" value="Save Preferences">
                </form>
            </div>

            <a href="index.html" class="home-link">Back to Home</a>
        </div>

        <script>
            // Theme preview function
            function previewTheme() {
                const themeSelect = document.getElementById('theme');
                document.body.classList.remove('dark-theme', 'light-theme');
                document.body.classList.add(themeSelect.value + '-theme');
            }

            // Language preview function
            function previewLanguage() {
                const langSelect = document.getElementById('language');
                document.body.setAttribute('lang', langSelect.value);
            }

            // Initialize with current theme if already set
            document.addEventListener('DOMContentLoaded', function() {
                const themeSelect = document.getElementById('theme');
                if (themeSelect) {
                    document.body.classList.add(themeSelect.value + '-theme');
                }

                const langSelect = document.getElementById('language');
                if (langSelect) {
                    document.body.setAttribute('lang', langSelect.value);
                }
            });
        </script>
</body>
</html>
```

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PreferenceServlet.java

```java
package com.example.cookies;

import java.io.*;
import javax.servlet.*;
import javax.servlet.http.*;

public class PreferenceServlet extends HttpServlet {

    protected void doGet(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        response.setContentType("text/html");
        PrintWriter out = response.getWriter();

        // Read cookies
        String theme = "dark"; // default to dark theme for neon effect
        String language = "en"; // default

        Cookie[] cookies = request.getCookies();
        if (cookies != null) {
            for (Cookie cookie : cookies) {
                if (cookie.getName().equals("theme")) {
                    theme = cookie.getValue();
                } else if (cookie.getName().equals("language")) {
                    language = cookie.getValue();
                }
            }
        }

        // Generate HTML with neon styling
        out.println("<!DOCTYPE html>");
        out.println("<html lang=\"" + language + "\">");
        out.println("<head>");
        out.println("<meta charset=\"UTF-8\">");
        out.println("<meta name=\"viewport\" content=\"width=device-width, initial-scale=1.0\">");
        out.println("<title>Neon Preferences</title>");
        out.println("<style>");
        out.println(":root {");
        out.println("  --neon-blue: #08f7fe;");
        out.println("  --neon-green: #09fbd3;");
        out.println("  --dark-bg: #0c0c15;");
        out.println("  --darker-bg: #07070e;");
        out.println("  --light-bg: #f5f5f5;");
        out.println("  --lighter-bg: #ffffff;");
        out.println("  --dark-text: #222;");
        out.println("  --glow: 0 0 10px;");
        out.println("}");
        out.println("");
        out.println("body {");
```

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```
out.println("    background: var(--dark-bg);");
out.println("    color: white;");
out.println("    font-family: 'Segoe UI', Tahoma, Geneva, Verdana, sans-
serif;");
out.println("    margin: 0;");
out.println("    padding: 20px;");
out.println("    min-height: 100vh;");
out.println("    display: flex;");
out.println("    flex-direction: column;");
out.println("    align-items: center;");
out.println("    transition: all 0.5s ease;");
out.println("    overflow-x: hidden;");
out.println("    background-image: ");
out.println("        radial-gradient(circle at 20% 30%, rgba(8, 247, 254,
0.1) 0%, transparent 25%),");
out.println("        radial-gradient(circle at 80% 70%, rgba(9, 251, 211,
0.1) 0%, transparent 25%);");
out.println("}");
out.println("");
out.println(".container {");
out.println("    max-width: 800px;");
out.println("    width: 90%;");
out.println("    background: rgba(12, 12, 21, 0.8);");
out.println("    border-radius: 15px;");
out.println("    padding: 30px;");
out.println("    box-shadow: 0 0 30px rgba(8, 247, 254, 0.2);");
out.println("    border: 1px solid rgba(8, 247, 254, 0.3);");
out.println("    backdrop-filter: blur(5px);");
out.println("    position: relative;");
out.println("    overflow: hidden;");
out.println("    z-index: 1;");
out.println("    animation: fadeIn 1s ease-out;");
out.println("}");
out.println("");
out.println("@keyframes fadeIn {");
out.println("    from { opacity: 0; transform: translateY(20px); }");
out.println("    to { opacity: 1; transform: translateY(0); }");
out.println("}");
out.println("");
out.println("h1 {");
out.println("    color: var(--neon-blue);");
out.println("    text-align: center;");
out.println("    font-size: 2.5rem;");
out.println("    margin-bottom: 30px;");
out.println("    text-shadow: var(--glow) var(--neon-blue);");
out.println("    animation: pulse 3s infinite alternate;");
out.println("}");
out.println("");
out.println("@keyframes pulse {");
out.println("    0% { text-shadow: 0 0 10px var(--neon-blue); }");
```

```java
        out.println("  100% { text-shadow: 0 0 20px var(--neon-blue), 0 0 30px
var(--neon-green); }");
        out.println("}");
        out.println("");
        out.println(".preference-card {");
        out.println("  background: rgba(7, 7, 14, 0.7);");
        out.println("  border-radius: 10px;");
        out.println("  padding: 20px;");
        out.println("  margin-bottom: 30px;");
        out.println("  border: 1px solid rgba(8, 247, 254, 0.2);");
        out.println("  transition: all 0.3s ease;");
        out.println("}");
        out.println("");
        out.println("h2 {");
        out.println("  color: var(--neon-green);");
        out.println("  margin-top: 0;");
        out.println("  font-size: 1.5rem;");
        out.println("  text-shadow: var(--glow) var(--neon-green);");
        out.println("}");
        out.println("");
        out.println(".form-group {");
        out.println("  margin-bottom: 20px;");
        out.println("}");
        out.println("");
        out.println("label {");
        out.println("  display: block;");
        out.println("  margin-bottom: 8px;");
        out.println("  color: var(--neon-blue);");
        out.println("  font-weight: bold;");
        out.println("}");
        out.println("");
        out.println("select, input[type=\"submit\"] {");
        out.println("  width: 100%;");
        out.println("  padding: 12px;");
        out.println("  background: var(--darker-bg);");
        out.println("  border: 1px solid var(--neon-blue);");
        out.println("  border-radius: 5px;");
        out.println("  color: white;");
        out.println("  font-size: 1rem;");
        out.println("  transition: all 0.3s ease;");
        out.println("}");
        out.println("");
        out.println("select:focus {");
        out.println("  outline: none;");
        out.println("  border-color: var(--neon-green);");
        out.println("  box-shadow: 0 0 15px var(--neon-green);");
        out.println("}");
        out.println("");
        out.println("input[type=\"submit\"] {");
        out.println("  background: linear-gradient(45deg, var(--neon-blue),
var(--neon-green));");
```
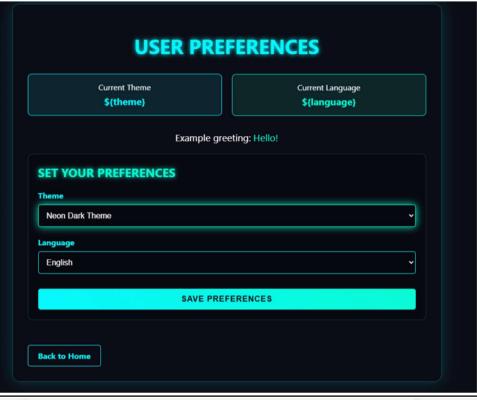
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```java
out.println("  color: var(--dark-bg);");
out.println("  font-weight: bold;");
out.println("  cursor: pointer;");
out.println("  border: none;");
out.println("  margin-top: 10px;");
out.println("  text-transform: uppercase;");
out.println("  letter-spacing: 1px;");
out.println("}");
out.println("");
out.println("input[type=\"submit\"]:hover {");
out.println("  transform: translateY(-2px);");
out.println("  box-shadow: 0 5px 15px rgba(8, 247, 254, 0.4);");
out.println("}");
out.println("");
out.println(".current-preferences {");
out.println("  display: flex;");
out.println("  gap: 20px;");
out.println("  margin-bottom: 30px;");
out.println("}");
out.println("");
out.println(".preference-badge {");
out.println("  flex: 1;");
out.println("  padding: 15px;");
out.println("  text-align: center;");
out.println("  background: rgba(8, 247, 254, 0.1);");
out.println("  border-radius: 8px;");
out.println("  border: 1px solid var(--neon-blue);");
out.println("  animation: float 4s ease-in-out infinite;");
out.println("}");
out.println("");
out.println(".preference-badge:nth-child(2) {");
out.println("  animation-delay: 0.5s;");
out.println("  border-color: var(--neon-green);");
out.println("  background: rgba(9, 251, 211, 0.1);");
out.println("}");
out.println("");
out.println("@keyframes float {");
out.println("  0%, 100% { transform: translateY(0); }");
out.println("  50% { transform: translateY(-10px); }");
out.println("}");
out.println("");
out.println(".preference-value {");
out.println("  font-size: 1.2rem;");
out.println("  font-weight: bold;");
out.println("  margin-top: 5px;");
out.println("  color: var(--neon-green);");
out.println("}");
out.println("");
out.println(".home-link {");
out.println("  display: inline-block;");
out.println("  margin-top: 20px;");
```
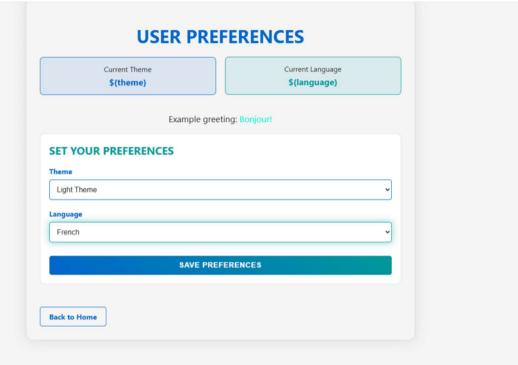
```java
        out.println("  color: var(--neon-blue);");
        out.println("  text-decoration: none;");
        out.println("  font-weight: bold;");
        out.println("  border: 1px solid var(--neon-blue);");
        out.println("  padding: 10px 20px;");
        out.println("  border-radius: 5px;");
        out.println("  transition: all 0.3s ease;");
        out.println("}");
        out.println("");
        out.println(".home-link:hover {");
        out.println("  background: var(--neon-blue);");
        out.println("  color: var(--dark-bg);");
        out.println("  text-shadow: none;");
        out.println("  box-shadow: 0 0 15px var(--neon-blue);");
        out.println("}");
        out.println("");
        out.println("body[lang=\"es\"] .language-example::after {");
        out.println("  content: \"¡Hola!\";");
        out.println("  color: var(--neon-green);");
        out.println("}");
        out.println("");
        out.println("body[lang=\"fr\"] .language-example::after {");
        out.println("  content: \"Bonjour!\";");
        out.println("  color: var(--neon-green);");
        out.println("}");
        out.println("");
        out.println("body[lang=\"en\"] .language-example::after {");
        out.println("  content: \"Hello!\";");
        out.println("  color: var(--neon-green);");
        out.println("}");
        out.println("</style>");
        out.println("</head>");
        out.println("<body class=\"" + ("dark".equals(theme) ? "dark-theme" :
"light-theme") + "\" lang=\"" + language + "\">");

        out.println("<div class=\"container\">");
        out.println("<h1>USER PREFERENCES</h1>");

        out.println("<div class=\"current-preferences\">");
        out.println("<div class=\"preference-badge theme-blue\">");
        out.println("<div>Current Theme</div>");
        out.println("<div class=\"preference-value\">" + theme + "</div>");
        out.println("</div>");
        out.println("<div class=\"preference-badge\">");
        out.println("<div>Current Language</div>");
        out.println("<div class=\"preference-value\">" + language + "</div>");
        out.println("</div>");
        out.println("</div>");

        out.println("<div class=\"language-example\" style=\"text-align:
center; margin: 20px 0; font-size: 1.2rem;\">");
```
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```java
        out.println("Example greeting: <span></span>");
        out.println("</div>");

        out.println("<div class=\"preference-card\">");
        out.println("<h2>SET YOUR PREFERENCES</h2>");
        out.println("<form method=\"post\" action=\"preferences\">");
        out.println("<div class=\"form-group\">");
        out.println("<label for=\"theme\">Theme</label>");
        out.println("<select name=\"theme\" id=\"theme\">");
        out.println("<option value=\"dark\"" + ("dark".equals(theme) ? "
selected" : "") + ">Neon Dark Theme</option>");
        out.println("<option value=\"light\"" + ("light".equals(theme) ? "
selected" : "") + ">Light Theme</option>");
        out.println("</select>");
        out.println("</div>");
        out.println("<div class=\"form-group\">");
        out.println("<label for=\"language\">Language</label>");
        out.println("<select name=\"language\" id=\"language\">");
        out.println("<option value=\"en\"" + ("en".equals(language) ? "
selected" : "") + ">English</option>");
        out.println("<option value=\"es\"" + ("es".equals(language) ? "
selected" : "") + ">Spanish</option>");
        out.println("<option value=\"fr\"" + ("fr".equals(language) ? "
selected" : "") + ">French</option>");
        out.println("</select>");
        out.println("</div>");

        out.println("<input type=\"submit\" value=\"Save Preferences\">");
        out.println("</form>");
        out.println("</div>")
        out.println("<a href=\"index.html\" class=\"home-link\">Back to
Home</a>");
        out.println("</div>");
        out.println("<script>");
        out.println("// Theme preview function");
        out.println("function previewTheme() {");
        out.println("  const themeSelect =
document.getElementById('theme');");
        out.println("  document.body.classList.remove('dark-theme', 'light-
theme');");
        out.println("  document.body.classList.add(themeSelect.value + '-
theme');");
        out.println("}");
        out.println("");
        out.println("// Language preview function");
        out.println("function previewLanguage() {");
        out.println("  const langSelect =
document.getElementById('language');");
        out.println("  document.body.setAttribute('lang',
langSelect.value);");
        out.println("}");
```

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```java
        out.println("");
        out.println("// Initialize with current theme if already set");
        out.println("document.addEventListener('DOMContentLoaded', function()
{");
        out.println("  const themeSelect =
document.getElementById('theme');");
        out.println("  if (themeSelect) {");
        out.println("    document.body.classList.add(themeSelect.value + '-
theme');");
        out.println("  }");
        out.println("  ");
        out.println("  const langSelect =
document.getElementById('language');");
        out.println("  if (langSelect) {");
        out.println("    document.body.setAttribute('lang',
langSelect.value);");
        out.println("  }");
        out.println("});");
        out.println("</script>");
        out.println("</body>");
        out.println("</html>");
    }
    protected void doPost(HttpServletRequest request, HttpServletResponse
response)
            throws ServletException, IOException {
        String theme = request.getParameter("theme");
        String language = request.getParameter("language");
        Cookie themeCookie = new Cookie("theme", theme);
        Cookie languageCookie = new Cookie("language", language);
        themeCookie.setMaxAge(60 * 60 * 24 * 365);
        languageCookie.setMaxAge(60 * 60 * 24 * 365);
        response.addCookie(themeCookie);
        response.addCookie(languageCookie);

        response.sendRedirect("preferences");
    }
}
```

OUTPUT:

RESULT:

The experiment successfully demonstrated HTTP cookies as an effective mechanism for maintaining persistent user preferences.

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