

**Overall Structure:**

The total project is divided into three parts (Java Servlets). Their names and corresponding functionalities are shown below:

1. management.java

This file is the core of this project. It is responsible for managing session cookies back and forth between client and server. To be specific, it generates the session ID and cookie for the first client request of each session and updates the value of the session cookie. Plus, it invokes the daemon process to control the session expiration.

2. Session.java

This file stores session state and provides functions retrieving relevant values of the session state. Also, it has the functions to update the session table and create cookies.

3. daemon.java

This file provides function to execute the stale session removal using timestamp. It is invoked by the constructor of management.java.

**Cookie Format:**

It contains two parts, the session ID and version number. They are separated by “\_” symbol.

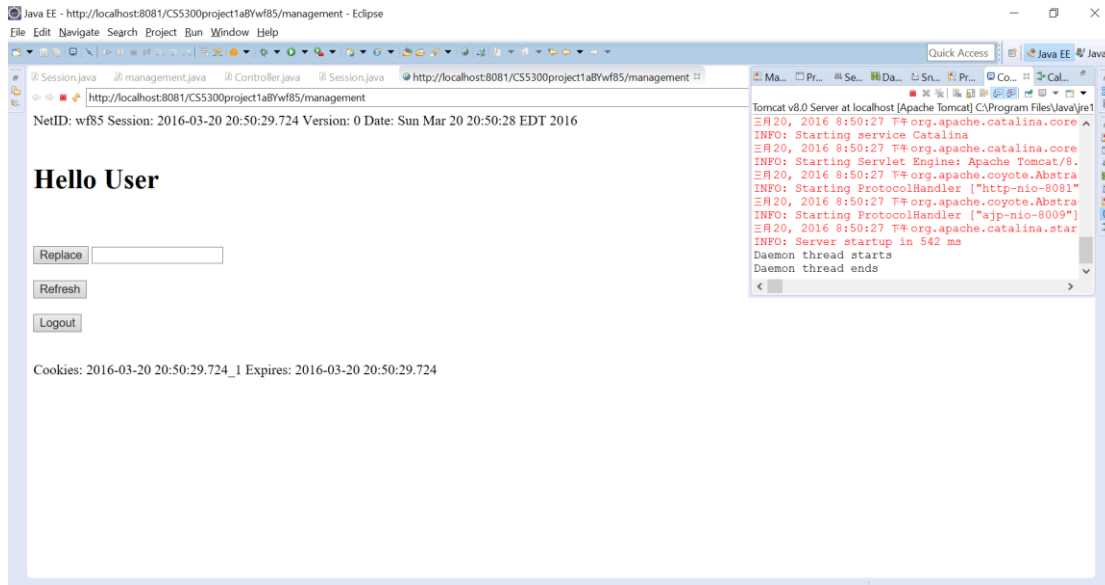
**Session Table:**

The session table is realized by ConcurrentHashMap<key,value>. “key” is a string which is actually session ID. Value is a string array including version number, message and expiration-timestamp.

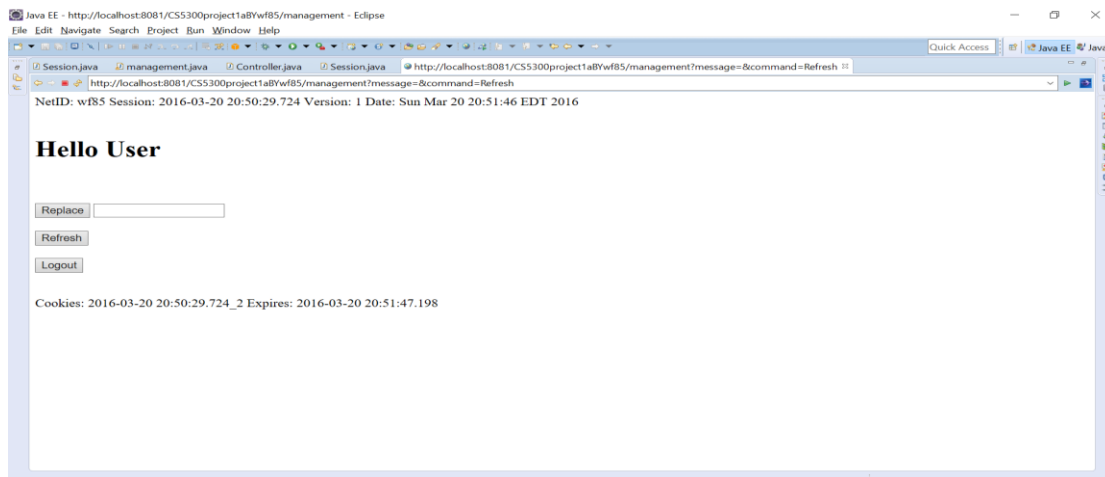
**Collect Garbage Timed-out Session:**

In the daemon.java file, the local variable “date” represents current time. “str” is the value of session table and “str[3]” is exactly the expiration time. Their difference between them represents how much time has passed after this session state happens. If it is bigger than the threshold “timeOut=1000”, it means that the session state is timed-out and it should be collected.

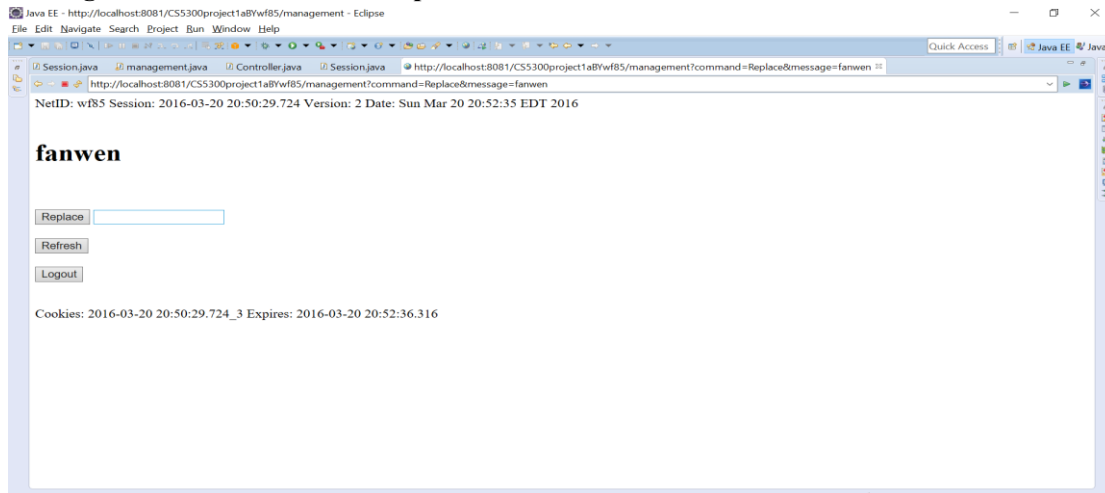
**Right after connecting to my site:**



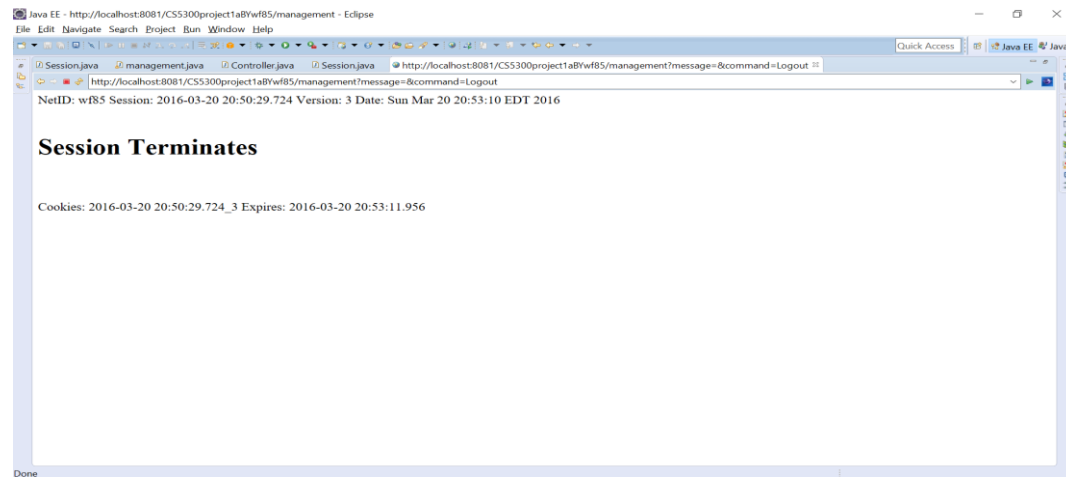
### After clicking Refresh:



### Adding some context and click Replace:



### After clicking Logout:

**Instruction:**

When you are trying to deploy the war file CS5300project1aBYwf85.war, please make sure that “management” is added after the URL “<http://localhost:8081/CS5300project1aBYwf85/>”, or the web page will not display correctly.