Distributed Programming I

Web Programming Test Assignment

Submission deadline July 19, 2017, 11.59p.m.

Build a simplified version of a website for booking appointments with the professor of a course in a University. For the sake of simplicity, the web site considers only one course, and a single time block of 3 consecutive hours (from 14:00 to 17:00).

The website must have the following features:

1. On the home page of the site, one can view all the bookings made so far, displaying both the requested duration and the assigned one. In addition, the home page of the site must show the total number of minutes of all the bookings made so far (both the total requested and the total assigned).

2. Each user can sign up freely on the site by providing a username, which must be a valid email address, and a password, which must contain at least one lowercase alphabetic character, one uppercase alphabetic character, and one numeric character (the user must be warned otherwise, before sending username and password to the server).

3. Each user can make a single booking. The booking is specified by selecting a duration, expressed as an integer number of minutes, which must not exceed 180. Booking for a higher number of minutes must be prevented. The booked time slot starts at the time instant corresponding to the position of the first free time in the overall time block (e.g. 14:00) and ends after the assigned number of minutes. Each user can, from his/her home page, cancel his/her booking but not modify its duration. Cancelling a booking causes a redistribution of the durations of all the remaining bookings, as explained below (point 4). Once the booking of a user has been cancelled, the user can make another booking, which will have a booked time slot that starts after all the already existing ones. The user's home page must have a command for logging out (i.e. stopping the user's authentication).

4. If a user requests a number of minutes lower than or equal to the number of free minutes available in the overall time block, a number of minutes equal to the requested amount will be assigned. Instead, if a number of free minutes are still available in the overall time block, but the requested number of minutes is greater than this number, this booking will be successful but the durations of the other bookings made so far by the other users will be reduced proportionally to the original requests made by the users, and the last booking will take the time that remains to 180. Finally, if no free time minute is available, a new booking fails. In this way, until the exhaustion of the free minutes, each user has the possibility to get an appointment, albeit with a duration less than what was originally requested, and the sum of all the actual durations of the bookings will always be 180 or less. If a user cancels a booking, the remaining bookings will be redistributed accordingly, with the same rules, keeping the same ordering of requests.

5. Example:

Let us assume there are 4 users A, B, C, D. Initially no one of them has made bookings.

A requests 120 minutes. Bookings: A from 14:00 to 16:00 (120 minutes).

B requests 30 minutes. Bookings: A from 14:00 to 16:00 (120 minutes), B from 16:00 to 16:30 (30 minutes).

C requests 50 minutes, which is greater than the remaining 30 free minutes. The other bookings are reduced proportionally to the other requests as follows. The total amount of requests is 200. For A we have 120/200*180 = 108 minutes. For B we have 30/200*180 = 27 minutes. The part that remains to 180 is 180-108-27=45, which is assigned to C. Bookings: A from 14:00 to 15:48 (108 minutes), B from 15:48 to 16:15 (27 minutes), C from 16:15 to 17:00 (45 minutes).

D requests 10 minutes. The request fails because there are no free minutes.

B cancels the booking. The new total becomes 120+50=170 minutes, which is less than 180. Hence, the bookings are assigned the full requested duration: A from 14:00 to 16:00 (120 minutes), C from 16:00 to 16:50 (50 minutes).

B performs another booking by requesting 80 minutes: The total amount of requested minutes now is 120+50+80=250, which is greater than 180. A proportional reduction is made: 120/250*180 = 86,4 minutes (rounded to 86). 50/250*180 = 36 minutes. Remaining: 180-86-36=58. Bookings: A from 14:00 to 15:26 (86 minutes), C from 15:26 to 16:02 (36 minutes), B from 16:02 to 17:00 (58 minutes).

6. In the delivered project, there must already be three users (A, B, C) with usernames a@p.it, b@p.it, c@p.it, and passwords pO1, pO2, pO3, respectively, who have made the following requests (in the order as they appear):

- A has requested 30 minutes

- B has requested 120 minutes

- C has requested 50 minutes.

7. Authentication through username and password remains valid if no more than two minutes have elapsed since the last page load. If a user attempts to perform an operation that requires authentication after an idle time of more than 2 minutes, the operation has no effect and the user is forced to re-authenticate with username and password. The use of HTTPS must be enforced for sign up and authentication and in any part of the site that displays private information of an authenticated user.

8. The general layout of the web pages must contain: a header in the upper part, a navigation bar on the left side with links or buttons to carry out the possible operations and a central part which is used for the main operation.

9. Cookies and Javascript must be enabled, otherwise the website may not work properly (in that case, for what concerns cookies, the user must be alerted and the website navigation must be forbidden, for what concerns Javascript the user must be informed; if Javascript and cookies are both disabled, the user needs not be alerted). Forms should be provided with small informational messages in order to explain the meaning of the different fields. These messages may be put within the fields themselves or may appear when the mouse pointer is over them.

10. The more uniform the views and the layouts are by varying the adopted browser, the better.

Submission instructions:
The instructions already published in the Material folder of the course web page for the installation on the cclix11.polito.it, still hold. **Furthermore**, you need to submit your project (the same that you installed on cclix11) in a zip file named sXXXXXX.zip (without blank spaces in the name) to the following web site:
https://**pad.polito.it**/enginframe/dp1/dp1.xml (from inside the Politecnico network) or
https://pad.polito.it:8080/enginframe/dp1/dp1.xml (from outside).

In addition:

1. The sql script included in the zip file (submitted to pad.polito.it) to create the database must have a name with the following pattern: sXXXXXX.sql (where XXXXXX is your own student id).
2. The main page of your web site must be put in a file named index.html or index.php in your SECRET_FILDER such that the website can be accessed at the url http://cclix11.polito.it/~sXXXXXX/SECRET_FOLDER without adding any other resource name at the end of the SECRET_FOLDER.
3. DO NOT use absolute links

WARNING: The system that accepts your projects, works in an automatic way and it will stop accepting submissions at the scheduled deadline. For this reason, we recommend you DO NOT submit your work in the very last minutes before the final deadline.

In case of any doubt and question related to the project, please firstly visit the forum in the course website in order to check if other students have already asked the same question. Otherwise use the forum (not the teacher email) to ask your question so that the response will be available to all students.

The forum has to be used exclusively for requests of clarification about the text of the assignment and not for requesting help about how to solve it or how to solve specific problems encountered during the execution of the assignment