Web Forum

Develop the core of a program to manage a web forum. All the classes belong to package `forum`.

R1 - Users

Management takes place through the facade class **Forum**, whose constructor receives as arguments a string containing the web url the forum will respond at (e.g. `http//www.polito.it/forum/Java/`), and which can be retrieved through method **getUrl()**.

To participate in the forum users must be previously registered through method **registerUser()** that receives as arguments nickname, first name, last name, email address, and password. In case the nickname is duplicated, the method must generate DuplicatedNickname exception. The method returns a **User** object.

Class User provides the getter methods, **getNick()**, **getFirst()**, **getLast()**, and **getEmail()** to read the respective attributes values.

Class Forum privides the method **login()** that accepts a nickname and a password and if a user exists with matching nickname and password returns the corresponding object, otherwise it returns null.

R2. Topic

The forum is structured into topics that can be created through method **createTopic()** of class Forum receiving as arguments the name, the subject, and the user who creates it; the method returns a **Topic** object. Given a topic object its characteristics can be accessed through methods **getName()**, **getSubject()**, and **getUser()**.

Class Forum provides the method **listTopic()** returning a collection of the created topics.

R3. Messages

Users can submit messages to the topics through method **submitMessage()** of class Topic that receives as arguments the user, the title of the message, the body of the message and returns a **Message** object. Given a message it is possible to know title, body, user who submitted it, and topic in which it was submitted, respectively through the methods **getTitle()**, **getBody()**, **getUser()**, **getTopic()**. Moreover the method **getTimestamp()** returns the system time at which the message was submitted (i.e. the time when the submitMessage() method was called).

Method **getMessages()** of class Topic returns the collection of all messages submitted to the topic.

Hint: to get system system time use the method: System.currentTimeMillis() that returns a long.

R4. Statistics

For each user it is possible to know the number of submitted messages through method **numSubmitted()** of class User. In addition the method **rankUsers()** of class Forum returns the collection of all users sorted by decreasing number of submitted messages.

Method **numMessages()** of class Topic returns the number of messages submitted to the topic.

Method **averageMessages()** of class Forum returns the average number of messages submitted to all topics.