SoftwareHouse

SofwareHouse is a Web Portal for programmers and software engineers, both novices and experts. The main objective of SofwareHouse is to help users learn to use the most popular programming languages.

The Portal has a forum in which novice programmers will be able to write their questions and ask for the opinion of an expert.

Besides, novices programmers can test their knowledge in different areas by participating in different contests.

Expert programmers can also take advantage of the Portal by seeking funding for their research projects.

Information requirements

1. The actors of the system are administrators, managers, apprentices, experts, and investors. For every actor, the system must store a name, a surname, an email, an optional phone number, an optional address and an optional photo. In the case of experts, the system must store some programming/software disciplines in which they are proficient.

2. Actors can use the forums of the system to start new threads or to write posts in a thread. The system must store the name of each forum, a short description of it and an optional picture. The system must also keep track of the number of started threads as well as the total number of posts in each forum.

3. When an actor starts a new thread in a forum, the following information must be stored: the title of the thread, the moment when it was started, the text, optional links to attachments and the actor who started it. Additionally, the actor who started the thread may decide to tag it by marking some disciplines, which the system must store. The system must also keep track of the number of posts written in each thread.

4. Actors write posts in the threads. For every post, the system must store the text, some optional links to attachments, the moment when it was written and the actor who wrote it. If a post has been chosen as "Best answer", it must be properly marked as such. Furthermore, posts that are reliable must also be appropriately marked in threads. Reliable posts are written by experts in threads started by apprentices. In order for a post to be reliable, the expert who wrote it must be expert in all of the marked disciplines the thread has (if any). Note that actors usually write posts as replies to the corresponding thread (or to complement it), but they are not required to. Actors may also write posts as replies or complements to other posts in the thread.

5. The system must keep track of the number of posts an actor has written. In the case of apprentices, the system must also store the number of points they have. Initially, an apprentice has 0 points. 5 points are awarded to an

apprentice each time he or she starts a new thread. 10 points are awarded when he or she writes a posts in a thread started by another apprentice. FInally, 20 points are awarded if a post that he or she has written has been marked as "Best answer".

6. Managers can organise contests. For every contest, the system must store a title, a description, a list of rules for apprentices, the moment when the contest will start and when it will end, the degree of difficulty (in a 1 to 5 range) of the contest, a number of points required to participate for free, the current number of available places for apprentices to participate, the price required to participate, the prize that will be awarded to the winner, the disciplines that the contest will challenge, the expert chosen to make up the problems for the contest and the experts that will be the judges who will grade the solutions provided by the participants.

7. The problems that an expert makes up for a contest consist of a clear statement, an optional picture and a mark (in range 0 to 10). The summation of the marks of the problems for a contest must always be equal to 10.

8. Apprentices apply for contests. For every application, the system must store the moment when it's made, a status, a ticker and an optional motivation letter. When an application is made, the initial status is "PENDING"; later, the corresponding manager can change it to "DUE" or to "REJECTED". The status "DUE" means that the application will be accepted (and its status will change to "ACCEPTED") as soon as the apprentice provides a valid credit card. If the apprentice has enough points to participate in the contest for free (greater or equal to the points required) the status will change to "ACCEPTED" as soon as the manager accepts the application and the applicant confirms assistance. If there are few available places, the manager is obligated to choose the apprentices that are going to participate by reading the motivation letters of the applications. The status "REJECTED" means that the application has been rejected and the applicant won't be able to participate. (When the number of available places is equal to 0 for a contest, the applications with status "DUE" or "PENDING" will change to "REJECTED" automatically). Also, applications with those status will change to "REJECTED" once the contest has passed.

9. Once an apprentice has an accepted application, he or she can assist the contest online on the scheduled date and time of the contest and elaborate a solution (composed of one answer per problem) within the time given. Note that no apprentice is able to know which problems are going to be asked before the start moment of the contest. The mark obtained by an apprentice is calculated as the summation of the marks of the answers graded by a judge.

10. Tickers are generated automatically, must be unique, and cannot be modified by any actor. They must adhere to the following pattern: DDMMYYYY-HH:mm-X-PPP-ZZZZ, where DDMMYYYY and HH:mm correspond to the moment of creation of the application, X is the grade of difficulty of the

contest, PPP is the number of available places at the moment of creation and ZZZZ are 4 random lower-case letters.

11. The system must store the following information about credit cards: a holder name, a brand name, a number, an expiration month, an expiration year, and a CVV code, which is an integer between 100 and 999

12. Experts conduct researches which need funding. For every research, the system must store a title, a subject, a description, a link to the official web page of the project, an optional start/end date of the project, a minimum cost they need to afford in order to start working on the research, the current budget, the members of the research team and the investors who are financing the project. The start date of a research is considered the date when the current budget reaches the minimum cost (if there is no start date the research cannot be conducted because the budget is not enough). The end date is the date when the research is over.

13. Investors finance the researches that need financial support. When an investment is made, the system must add the invested amount to the budget of the corresponding research.

Functional requirements

14. An actor who is not authenticated must be able to:
    14.1. Register to the system as an apprentice or an investor.
    14.2. Browse the forums of the system and display their threads.
    14.3. Browse the threads of a forum and display the corresponding posts.

15. An actor who is authenticated must be able to:
    15.1. Do the same as an actor who is not authenticated, but register to the system.
    15.2. Edit his or her personal data.
    15.3. Start a new thread in a forum.
    15.4. Modify the threads that he or she has started. Note that a thread cannot be deleted by its creator.
    15.5. Write a new post in a thread as a reply or a complement to the thread.
    15.6. Write a new post in a thread as a reply or a complement to another post in the thread.
    15.7. Manage the posts that he or she has written, which includes modifying and deleting them. When a post is deleted by its writer, it must be appropriately marked and its text must not be visible to anyone. However, the post must not be deleted from the system.

16. An actor who is authenticated as an apprentice must be able to:
    16.1. Mark as "Best answer" a post written in a thread that he or she has started. The post must be directly associated to the thread. Posts

written as a reply or complement to another post can't be marked as "Best answer".

    16.2.   List/Display the contests saved in final mode.

    16.3.   Apply for a contest.

    16.4.   List the applications that he or she's made, grouped by status.

    16.5.   Enter a credit card to get an application accepted as long as its status is "DUE".

    16.6.   Create and save a solution (composed of the answers to the problems) for a contest for which he or she has applied previously and has an application with an "ACCEPTED" status. The solution must be provided in the period of time between the start and the end moment of the contest.

    16.7.   Display the winner/s of the contests once they are finished and assessed.

17.   An actor who is authenticated as an expert must be able to:

    17.1.   List/Display the contests that are saved in draft mode in which he or she has been chosen to make up the problems.

    17.2.   Create a problem and associate it to a contest saved in draft mode in which he or she has been chosen to make up the problems.

    17.3.   Manage the problems that he or she has created, which includes modifying and deleting them as long as the corresponding contest is saved in draft mode.

    17.4.   List/Display the contest that are saved in final mode and have passed in which he or she has been chosen as a judge in order to grade the solutions elaborated by the participants.

    17.5.   Grade a solution made by a participant of a contest. Note that the solution mark is the summation of all the marks to the answers that compose the solution and that the participant who has elaborated the solution must be kept anonymous.

    17.6.   Conduct a research.

    17.7.   Manage the researches in which he or she participates, which includes listing them and modifying them. Note that a research cannot be deleted.

    17.8.   Cancel a research that has started, but it is not over yet.

18.   An actor who is authenticated as a manager must be able to:

    18.1.   Manage contests, which includes listing/displaying them, saving them in draft mode (which means that contests are not published yet) and modifying and deleting them as long as they are saved in draft mode. However, a contest can also be saved in final mode as long as it contains at least one question added by the chosen expert. A contest saved in final mode can no longer be modified or deleted and is

considered published. Note that the expert chosen to make up the problems for a contest must be proficient in all the disciplines that the contest challenges.

18.2. Manage the applications for the contest that he or she organises, which includes listing/displaying them and changing their status from "PENDING" to "REJECTED" or "DUE".

19. An actor who is authenticated as an investor must be able to:
   19.1. List the researches that need funding. A research needs funding if it is not over yet and if it has not been cancelled.
   19.2. Enter a valid credit card to transfer a certain amount of money to a research that needs funding.

20. An actor who is authenticated as an administrator must be able to:
   20.1. Create accounts for new managers and experts.
   20.2. Create a new forum.
   20.3. Manage the forums of the system, which includes listing, modifying and deleting them. When a forum is deleted, all of its corresponding threads and posts are deleted as well.
   20.4. Delete a thread that he or she thinks is inappropriate. When a thread is deleted, all of its corresponding posts are deleted as well.
   20.5. Delete a post that he or she thinks is inappropriate. When a post is deleted by the administrator, it must be appropriately marked and its text must not be visible to anyone. However, the post must not be deleted from the system.
   20.6. Manage the list of disciplines, which includes listing, creating, modifying and deleting them.
   20.7. List all System's contest (draft and final mode).
   20.8. Display a dashboard with the following information:
      20.8.1. The ratio of applications with status "PENDING".
      20.8.2. The ratio of applications with status "DUE".
      20.8.3. The ratio of applications with status "ACCEPTED".
      20.8.4. The ratio of applications with status "REJECTED".
      20.8.5. The ratio of researches that haven't started yet (means that they don't have enough budget to afford the minimum cost) versus the total number of researches.
      20.8.6. The ratio of post deleted versus the total number of posts.
      20.8.7. The average, the minimum, the maximum, and the standard deviation of the number of threads per forum.
      20.8.8. The average, the minimum, the maximum, and the standard deviation of the number of posts per thread.

20.8.9. The average, the minimum, the maximum, and the standard deviation of the number of applications per contest

20.8.10. The average, the minimum, the maximum, and the standard deviation of the number of investments per research.

20.8.11. The average, the minimum, the maximum, and the standard deviation of the number of problems per contest.

20.8.12. The listing of actors that have posted at least 10% more posts than the average.

20.8.13. A table with the minimum, the maximum and the average mark obtained in each contest.

Non-functional requirements

21. The system must be available in English and Spanish. (The data themselves are not required to be available in several languages, only the messages that the system displays.)

22. Photos are not required to be store in the database, but links to external systems like Flickr.com, Tumblr.com, or Pinterest.com.

23. The system must be as efficient as possible.

24. The system will be run in Spain, so it must comply with the Spanish regulations.

25. The "Terms and Conditions" document must make it explicit the reasons why a post or a thread may be considered inappropriate and thus can be removed from the system by an administrator.

26. Whenever an application is shown, it must be rendered differently depending on its status, namely: pending applications must be shown on a white background, rejected applications must be shown on a red background; due applications must be shown on a yellow background and accepted applications must be shown on a green background.

27. The default list of forums is: "New members", "SoftwareHouse News", "JAVA Chat", "Python Chat", "C+ Chat", "C# Chat", "PHP Chat", "MySQL Chat", "Javascript Chat", "General Talk".

28. The default list of disciplines is: "Java", "Python", "C+", "C#", "MySQL", "Oracle", "Javascript", "JQuery", "UML", "HTML", "JSTL", "CSS", "Spring", "Hibernate", "PHP", "Android".

29. It'd be very appreciated if the threads in a forum are ordered according to the moment of publication of their last post. It'd also be appreciated if the users of the system can see which is the last post of any thread or forum.