Narrative

Many students may have trouble solving chemistry problems. While students are the main group of these doubts it is not limited to only them, but can also benefit educators who may sometimes forget the steps required to solve these problems. The goal of this platform is to create an easy way to understand and solve chemistry problems. By scanning or entering the chemistry problem onto the app it will allow the user to see the step-by-step process of how the problem is solved.

Requirements

Key Requirements

- Each equation that the system solves must show the procedure of the solution step by step.
- The interface of the app should be as intuitive as possible.
- The app will have a keyboard with symbols and characters used in chemistry.
- The camera logo will allow the user to use the device's camera to introduce the data.
- The app should allow users to report to developers if a problem arises with some exercise.

Secondary Requirements

- The system must identify the level of the problem; if it is an advanced problem and the user doesn't have the correct credentials they cannot receive a solution.
- The main color of the interface will be sky blue.
- Users can rank responses, for future updates of the app.

- Every user should be able to login and log out of the app.
- Only specific users can sign up for an account, specifically users coursing more advanced topics, like Organic Chemistry, or are working with more complex material in general.
- The app should save a user's problem history, and they should be able to access it from their profile.
- The system should be able to handle all the users at the same time.
- The system should not have an earlier version of (iOS 13 for iPhones and Android OS 5).

Terminology

ChemCam App - Application to solve chemistry problems.

Contact Details - chemcamapp@gmail.com, 787-208-0252

Data Library - Data stored for solving chemistry problems.

Camera access - Access the camera to take photos of the problems the user wants the system to solve.

Domain Entities

User - Person who is interested in the app and wants help resolving their chemical course problems.

Chemistry- The science that deals with the properties, compositions, and structure of substances and the main topic of the application.

Chemistry courses- Is a program that teaches students the conduct of laboratory procedures in chemistry and the use of the instrumentation in analytical and synthetic work. Chemistry provides a foundation for understanding both the basis and applied scientific disciplines at a fundamental level.

Chemical formulas - A chemical formula is a way of presenting information about the chemical proportions of atoms that constitute a particular chemical compound or molecule, using chemical element symbols, numbers, and sometimes also other symbols. The app would have these formulas saved in a library and it would use those to resolve the different chemical problems.

Students- People who are studying at a university or school. Students taking chemical relationship classes are the main users of this app.

Chemistry problems- The exercises that the user wants to solve or learn from.

Domain Functions

Create user profile - Users can create their own profile. When users are creating their profile they will have the option to personalize it adding their information such as, major, current year, favorite chemistry topic and they can also see a history of the questions asked and their answer.

Choose difficulty level - Users can choose the difficulty level based on their knowledge or education level In this way if they have advanced problems they can be answered more efficiently.

Scan chemical problems sheet - Users can scan their chemical problems using their phone, taking a picture of it and uploading it into the app so in this way the app can analyze the problem and give an answer to it.

Analyze exercises - Users can analyze different exercises that are similar to their problems and questions that have already been answered by the app.

Review answered problems - The users can review their problems and their answers. Each answer will be saved to that user's account and they can review it in a question history option.

Domain Events

- ➢ User inputs a problem manually.
- ➢ User inputs a problem via Photo Taken.
- ➢ User inputs a problem via a Picture.
- ➢ User checks if the problem is well written.
- ➢ System solves a problem.
- ➢ System gives an explanation of a problem.
- ➢ System searches for formulas on the data library.

Domain Behaviors

- ➢ System will show the step-by-step process.
- ➢ System will show the answer to the problem.
- ➢ Users can give feedback about the system.

Domain Requirements

- The system must be able to store data of the different equations and book information to solve the different problems given.
- The system must be able to answer the problems given step by step via pictures, photos taken or manually written problems.
- The system must answer the problems in different ways so the user has more options and more flexibility with each exercise.

Interface Requirements

- The system needs a form to interact with the UI.
- The system needs a form to access the camera.
- The system needs a form to delete inputs.
- The system needs a form of displaying pictures and information about the different problems that are being solved.
- The system needs a form of solving the different problems it is asked to solve.

Machine Requirements

Performance Requirements

- The solution for a problem must be solved seconds after it is inputed.
- The database must store all the necessary data and references for solving and analyzing a problem. Plus, the historical data for every user and problems solved for that user.
- Must use the user's camera device of choice.

Dependability Requirements

- The system depends on the input from experts of the industry for help on expressing the solutions and analysis up to the professional standard.
- It depends on the various methodologies, terminologies, and jargons of the chemistry community.
- For picture input, the system depends on the quality of the camera to assure effectiveness.

Maintenance Requirements

- With the feedback provided by the users, we will do the necessary improvements and updates to the application.
- The system must have a database to store information.

Platform Requirements

- The system must be accessible to users on mobile devices, whether it is iOS or Android.
- Application shall be Web Based.
- Successfully implemented with a frame such as Django or Flask.