

Software Requirements Specification

for

<Elementally>

Version 1.0

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1. INTRODUCTION

A group of students from the Analysis and Design of Algorithms course are going to carry out a project to learn the periodic table of elements. The program's objective is to teach the contents of the periodic table, allowing basic, intermediate, and advanced learning levels. Upon completing the learning process, the program should conduct an evaluation to assess the learned contents based on the selected level; this evaluation can be repeated as desired. The program will require a login for existing users, registration for new users, and a guest option (which will only be able to use the periodic table, which should also be included in the program). It will also require a menu where users can select the table, choose the learning level, select the evaluation, or search for any element (with its respective history), including all detailed information of each element, just like the periodic table. It should feature a progress bar indicating the percentage of learning level completed. The selected evaluation level should correspond to the learning level. The program should be developed so that it can be purchased by different secondary educational institutions (target audience) and modified according to their preferences. The program should be easy to use, as it is intended for secondary school students, as mentioned earlier.

1.1 *Purpose*

The purpose of this project is to create an application that allow users in an interactive manner to learn the different elements of the Mendeleiev's periodic table of elements, its groups as well as its relative order with a preparatory level of difficulty.

1.2 *Document Conventions*

Font for the body: *Computer Modern* normal 10 pts

Font for images: *Computer Modern* normal 10 pts bold

Font for title: *Consolas* 32 pts

Font for subtitles: *Consolas* 16 pts

1.3 *Intended Audience and Reading Suggestions*

This document is intended for readers, users, developers and testers. As in the document are written all of the details and specifications needed to understand in

1.4 *Product Scope*

The objective is to teach the periodic table intuitively, providing ease of use for the user, allowing clear visibility of the elements and facilitating learning through practical use, teaching and evaluating in a modularized manner.

1.5 *References*

The information provided in the software is verified with IUPAC database.

2. Overall Description

2.1 *Product Perspective*

This product provides intuitive and didactic information about the periodic table, its elements, composition, and order.

2.2 *Product Functions*

- Guest
- Login
- Logout
- Register
- Instructions
- Take a quiz
- Start learning (take a class/exam)

2.3 *User Classes and Characteristics*

- User
- Administrator

2.4 *Operating Environment*

Web browser

2.5 *Design and Implementation Constraints*

Some regulations, such as the General Data Protection Regulation (GDPR), require organizations to take necessary steps to ensure the security of personal data, including the use of complex passwords.

- Must be at least 12 characters long
- Five attempts are allowed before imposing a temporary lockout of 10 minutes
- Must include both uppercase and lowercase letters (a-z and A-Z)
- Must include a number (0-9)
- Must include a special character (!, @, #, %, etc.)
- Cannot include the word “Zendesk”
- Cannot resemble an email address
- Must be checked against a list of known breached passwords to ensure it is not one of them

The protocol used by MySQL for communication between clients and server is the MySQL Transport Protocol, also known as the MySQL Communication Protocol

2.6 *User Documentation*

Manual, FAQ, Tutorial (template available within the program to indicate how to use it)

2.7 Assumptions and Dependencies

Ruby will be used as the development language, one of the third-party components is MySQL, and the Sinatra framework will be utilized.

3 External Interface Requirements

3.1 User Interfaces

Standard in relation to its typography.(**a sketch/scheme of the interface should be inserted in here).**

The interface is composed of:

- Main screen
- Login/Create user
- Learn
- Evaluation
- Exploration

3.2 Hardware Interfaces

Mouse, keyboard and standard protocols

3.3 Software Interfaces

OS: Windows / Linux

Database: MySQL

Developing tools: VisualStudio, IntelliJ, Netbeans

Libraries: those for the database,

3.4 Communications Interfaces

TBD

4 System Features

- **Feature 1**

4.1.1 Welcome Screen: It's the first thing the user encounters, and it should be easy to use.

4.1.2 All users encounter this screen as soon as the program starts.

4.1.3 It's the interface through which the following functional requirements coexist: (create user, login, start course, user progress, tutorial, start evaluation).

- **Feature 2**

4.2.1 Login: Users enter their personal data if they are not registered (Name, Last Name, CUIL, Email, Address, Date of Birth, Phone Number, Alias, and Password).

4.2.2 Accessed through the main screen.

4.2.3 If the user is already registered, they can log in with their Alias or Email.

4.2.4 If the user doesn't want to register, they have the option to enter as a guest, with reduced functionality.

- **Feature 3**

4.3.1 Element Search: Given a symbol, name, group, period, or atomic weight, the user can search for a specific element.

4.3.2 The user can access a history containing the last searched elements.

- **Feature 4**

4.4.1 Periodic Table: The user can access a periodic table through the menu.

4.4.2 The table can be separated by groups and periods through an option.

4.4.3 The user can view each element separately.

- **Feature 5**

4.5.1 Learning: Learning will progress gradually as desired by the user.

4.5.2 Progress will be automatically saved at the end of each topic.

4.5.3 A progress bar will indicate the percentage of learning completed by the student.

4.5.4 The user has the option to repeat the learning once finished.

- **Feature 6**

4.6.1 Evaluation: Assessing knowledge learned in feature 5.

4.6.2 The user must select or write the correct answer to a question.

4.6.3 The user can repeat the evaluation.

4.6.4 The evaluation provides a numerical score to the user.

5 Other Nonfunctional Requirements

5.1 *Performance Requirements*

It should automatically store the learning progress (module-based, last exam, performance) of the user persistently.

5.2 *Safety Requirements*

5.3 *Security Requirements*

It is crucial that the system adheres to recommended security standards and methods to safeguard the integrity of the system, with a high priority placed on user data privacy and information.

5.4 *Software Quality Attributes*

5.5 *Business Rules*

6 Other requirements

Appendix A: Glossary

Appendix B: Analysis Models

Appendix C: To Be Determined List