Software Requirements Specification

for

Digital Modern Periodic Table

Prepared by

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1 Introduction

TO DO: Implementation of Digital Modern Periodic Table which is a simple educational console application using C++ programming Language.

1.1 Document Purpose

The purpose of making this document is to give the detail idea of framing this project. The main aim in creating this document is to clear the specifications required in making this project. We will come to know which software is used to built up this project as well as the scope of this project and many other features such as product overview, product functionality, design and implementation, external interface and many more things which are well described below in this document.

1.2 Product Scope

It has a tremendous scope in E- Learning. Students can easily get the specified element and its properties in one click. They don't need to install any application, get disturbed by the adds that enter while using that application.

1.3 Intended Audience and Document Overview

This project is a prototype for the digital modern periodic table. This has been implemented under the guidance of college professors. This project is useful for the students who are learning the subject chemistry.

1.4 Definitions, Acronyms and Abbreviations

Modern Periodic Table –

The modern periodic table is used to organize all the known elements. Elements are arranged in the table by increasing atomic number. In the modern periodic table, each element is represented by its chemical symbol. Columns of the periodic table are called groups and the rows are known as period. Elements in the same group have similar properties.

1.5 Document Conventions

In general, this document follows the IEEE formatting requirements. We have used Arial font size 11, or 12 throughout the document for text and italics for comments. Document text is single spaced and maintain the 1" margins found in this template.

1.6 References

https://krazytech.com/projects

2 Overall Description

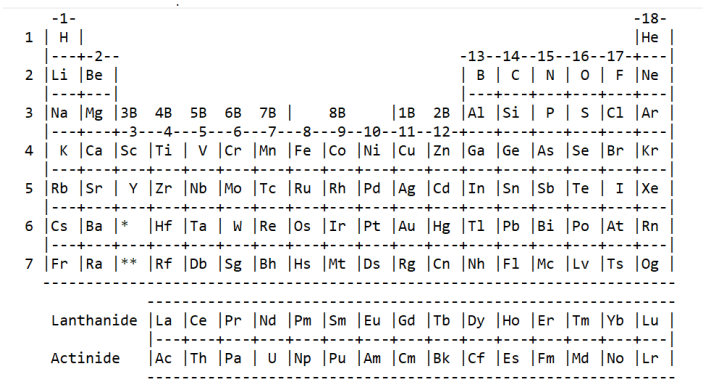
2.1 Product Overview

Periodic Table is used to manage all the entries and data to the file for basic use of user. Project is developed by using basic concepts of C++ programming.

In project we can also use C++ graphics to look better. We provide the main menu options in the project from which you can select any.

This program will help students to get the details regarding each element which are available within the periodic table. It will enable the students to get the details of each element by just one click. This program is easy to run and get details of each elements. Users have to just select the particular element by moving arrows up and down and then press enter to get information such as atomic number, their atomic value, their location in the periodic table.

Once the program has been run, it will display the Home screen displaying welcome and the people behind this project.



2.2 Product Functionality

Implementation Description –

- *Header files –*

```
#include<iostream>
#include<conio.h>
#include<windows.h>
#include<string.h>
#include<process.h>
#include<stdio.h>
```

- *Inbuilt Functions –*

1. *goto() – this function helps us to directly go to any function we used in the program.*

2. *strcmpi() – this function is used to compare the two strings in the program.*
3. *strcpy() – this function is used to copy the one string as it is to another string.*
4. *clrscr() – this function is used to clear the screen and make the output window ready for the further execution.*
5. *getch() – this function is used to get the characters.*
6. *gets() – this function is used to get the string.*

Main() – this function is used to access the main part of the program.

2.3 Design and Implementation Constraints

In actual case, the program looks very easy to run but for developer it is quite a lengthy code.

3 Specific Requirements

3.1 External Interface Requirements

3.1.1 User Interfaces

The user should have a C++ compiler to run the code in any operating system (Linux is most preferable) and a bit knowledge about elements of periodic table as a prerequisite.

3.1.2 Hardware Interfaces

The user should have PC or a laptop where he/she can run the program using compiler.

3.1.3 Software Interfaces

Any C++ compiler is applicable for this project.

4 Other Non-functional Requirements

4.1 Safety and Security Requirements

There is no harm in using this project. But if in worst case any issue arises while compiling the program resulting in hanging of the device (PC, laptop, etc.) then for security purpose any antivirus software should be preinstalled in the device.

4.2 Software Quality Attributes

Software Quality Attributes are: *Correctness, Reliability, Adequacy, Learnability, Robustness, Maintainability, Readability, Extensibility, Testability, Efficiency, Portability.*

Correctness: *The correctness of a software system refers to:*

– Agreement of program code with specifications
– Independence of the actual application of the software system.

The correctness of a program becomes especially critical when it is embedded in a complex software system.

Reliability: *Reliability of a software system derives from*

– Correctness
– Availability

A software system can be seen as reliable if this test produces a low error rate (i.e., the probability that an error will occur in a specified time interval.)

Adequacy: *Factors for the requirement of Adequacy:*

– The input required of the user should be limited to only what is necessary. The software system should expect information only if it is necessary for the functions that the user wishes to carry out.

Learnability: *Learnability of a software system depends on:*

– The design of user interfaces
– The clarity and the simplicity of the user instructions (tutorial or user manual).

Robustness: *Robustness reduces the impact of operational mistakes, erroneous input data, and hardware errors.*

Maintainability: *Maintainability = suitability for debugging (localization and correction of errors) and for modification and extension of functionality.*

The maintainability of a software system depends on its:

– Readability
– Extensibility
– Testability

Readability: *Readability of a software system depends on its:*

– Form of representation
– Programming style
– Consistency
– Readability of the implementation programming languages
– Structuredness of the system
– Quality of the documentation
– Tools available for inspection

Extensibility: *Extensibility allows required modifications at the appropriate locations to be made without undesirable side effects. Extensibility of a software system depends on its:*

– Structuredness (modularity) of the software system
– Possibilities that the implementation language provides for this purpose
– Readability (to find the appropriate location) of the code
– Availability of comprehensible program documentation

Testability: *suitability for allowing the programmer to follow program execution (runtime behavior under given conditions) and for debugging. The testability of a software system depends on its:*

– Modularity
– Structuredness

Efficiency: *ability of a software system to fulfill its purpose with the best possible utilization of all necessary resources (time, storage, transmission channels, and peripherals).*

Portability: *the ease with which a software system can be adapted to run on computers other than the one for which it was designed.*

5 Other Requirements

5.1 118 Elements and Their Symbols and Atomic Numbers

Name of the Element	Symbol of the Element	Atomic Number
Hydrogen	H	1
Helium	He	2
Lithium	Li	3
Beryllium	Be	4
Boron	B	5
Carbon	C	6
Nitrogen	N	7
Oxygen	O	8
Fluorine	F	9
Neon	Ne	10
Sodium	Na	11
Magnesium	Mg	12
Aluminium	Al	13
Silicon	Si	14
Phosphorus	P	15
Sulfur	S	16
Chlorine	Cl	17
Argon	Ar	18

Potassium	K	19
Calcium	Ca	20
Scandium	Sc	21
Titanium	Ti	22
Vanadium	V	23
Chromium	Cr	24
Manganese	Mn	25
Iron	Fe	26
Cobalt	Co	27
Nickel	Ni	28
Copper	Cu	29
Zinc	Zn	30
Gallium	Ga	31
Germanium	Ge	32
Arsenic	As	33
Selenium	Se	34
Bromine	Br	35
Krypton	Kr	36
Rubidium	Rb	37
Strontium	Sr	38
Yttrium	Y	39
Zirconium	Zr	40

Niobium	Nb	41
Molybdenum	Mo	42
Technetium	Tc	43
Ruthenium	Ru	44
Rhodium	Rh	45
Palladium	Pd	46
Silver	Ag	47
Cadmium	Cd	48
Indium	In	49
Tin	Sn	50
Antimony	Sb	51
Tellurium	Te	52
Iodine	I	53
Xenon	Xe	54
Cesium	Cs	55
Barium	Ba	56
Lanthanum	La	57
Cerium	Ce	58
Praseodymium	Pr	59
Neodymium	Nd	60
Promethium	Pm	61
Samarium	Sm	62

Europium	Eu	63
Gadolinium	Gd	64
Terbium	Tb	65
Dysprosium	Dy	66
Holmium	Ho	67
Erbium	Er	68
Thulium	Tm	69
Ytterbium	Yb	70
Lutetium	Lu	71
Hafnium	Hf	72
Tantalum	Ta	73
Tungsten	W	74
Rhenium	Re	75
Osmium	Os	76
Iridium	Ir	77
Platinum	Pt	78
Gold	Au	79
Mercury	Hg	80
Thallium	Tl	81
Lead	Pb	82
Bismuth	Bi	83
Polonium	Po	84

Astatine	At	85
Radon	Rn	86
Francium	Fr	87
Radium	Ra	88
Actinium	Ac	89
Thorium	Th	90
Protactinium	Pa	91
Uranium	U	92
Neptunium	Np	93
Plutonium	Pu	94
Americium	Am	95
Curium	Cm	96
Berkelium	Bk	97
Californium	Cf	98
Einsteinium	Es	99
Fermium	Fm	100
Mendelevium	Md	101
Nobelium	No	102
Lawrencium	Lr	103
Rutherfordium	Rf	104
Dubnium	Db	105
Seaborgium	Sg	106

Bohrium	Bh	107
Hassium	Hs	108
Meitnerium	Mt	109
Darmstadtium	Ds	110
Roentgenium	Rg	111
Copernicium	Cn	112
Nihonium	Nh	113
Flerovium	Fl	114
Moscovium	Mc	115
Livermorium	Lv	116
Tennessine	Ts	117
Oganesson	Og	118

Appendix A – Data Dictionary

- ***C++ programming Language. –***

  C++ is a general-purpose programming language created by Bjarne Stroustrup as an extension of the C programming language, or "C with Classes".

- ***C++ compiler –***

In computing, a compiler is a computer program that translates computer code written in one programming language (the source language) into another language (the target language).

- ***C++ Graphics –***

  C++ programming language is a versatile programming language. Using C++, you can create low end graphics too i.e., creating basic shapes and words with stylish fonts and adding colors to them can be done using C++.

- ***E- Learning –***

  E-learning, also referred to as online learning or electronic learning, is the acquisition of knowledge which takes place through electronic technologies and media.

- ***IEEE –***

  The Institute of Electrical and Electronics Engineers *(IEEE) is a professional association for electronic engineering and electrical engineering (and associated disciplines) with its corporate office in New York City[4] and its operations center in Piscataway, New Jersey.*

- ***Linux –***

Linux is a family of open-source Unix-like operating systems based on the Linux kernel an operating system kernel first released on September 17, 1991, by Linus Torvalds.