Software Requirements Specification

for

Digital Modern Periodic Table

Prepared by

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# Introduction

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

## 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.*

## 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.*

## 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.*

## 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.*

## 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.

## References

<https://krazytech.com/projects>

# Overall Description

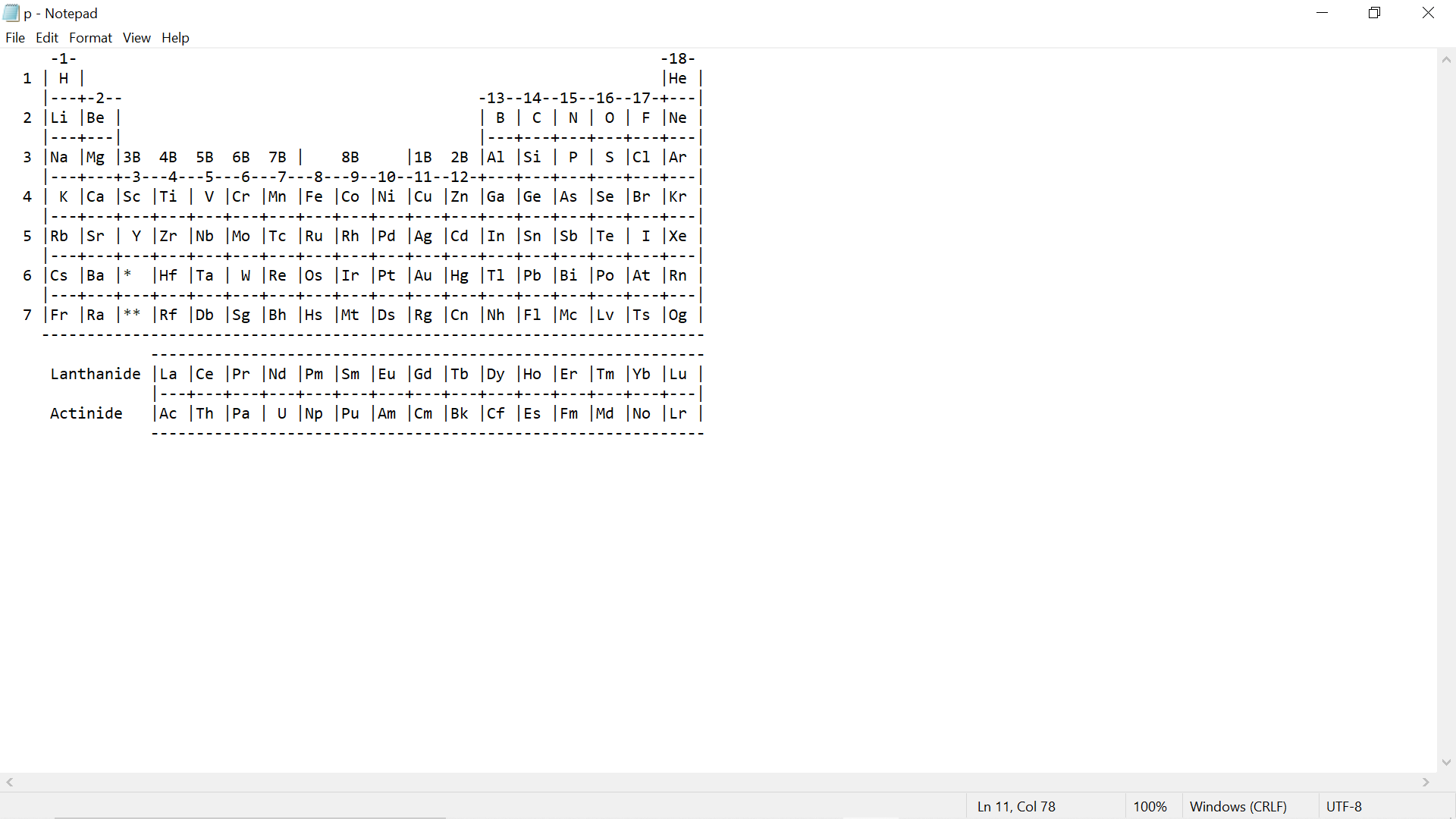
## Product Overview

*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.*



## 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.*

## Design and Implementation Constraints

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

# Specific Requirements

## External Interface Requirements

### 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.*

### Hardware Interfaces

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

### Software Interfaces

Any C++ compiler is applicable for this project.

# Other Non-functional Requirements

## 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.*

## 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.*

# Other Requirements

## 118 Elements and Their Symbols and Atomic Numbers

|  |  |  |
| --- | --- | --- |
| **Name of the Element** | **Symbol of the Element** | **Atomic Number** |
| [Hydrogen](https://byjus.com/chemistry/hydrogen/) | H | 1 |
| [Helium](https://byjus.com/chemistry/helium/) | He | 2 |
| [Lithium](https://byjus.com/chemistry/lithium/) | Li | 3 |
| [Beryllium](https://byjus.com/chemistry/beryllium/) | Be | 4 |
| [Boron](https://byjus.com/chemistry/boron/) | B | 5 |
| [Carbon](https://byjus.com/chemistry/carbon/) | C | 6 |
| [Nitrogen](https://byjus.com/chemistry/nitrogen/) | N | 7 |
| [Oxygen](https://byjus.com/chemistry/oxygen/) | O | 8 |
| [Fluorine](https://byjus.com/chemistry/fluorine/) | F | 9 |
| [Neon](https://byjus.com/chemistry/neon/) | Ne | 10 |
| [Sodium](https://byjus.com/chemistry/sodium/) | Na | 11 |
| [Magnesium](https://byjus.com/chemistry/magnesium/) | Mg | 12 |
| [Aluminium](https://byjus.com/chemistry/aluminum/) | Al | 13 |
| [Silicon](https://byjus.com/chemistry/silicon/) | Si | 14 |
| [Phosphorus](https://byjus.com/chemistry/phosphorus/) | P | 15 |
| [Sulfur](https://byjus.com/chemistry/sulfur/) | S | 16 |
| [Chlorine](https://byjus.com/chemistry/chlorine/) | Cl | 17 |
| [Argon](https://byjus.com/chemistry/argon/) | Ar | 18 |
| [Potassium](https://byjus.com/chemistry/potassium/) | K | 19 |
| [Calcium](https://byjus.com/chemistry/calcium/) | Ca | 20 |
| [Scandium](https://byjus.com/chemistry/scandium/) | Sc | 21 |
| [Titanium](https://byjus.com/chemistry/titanium/) | Ti | 22 |
| [Vanadium](https://byjus.com/chemistry/vanadium/) | V | 23 |
| [Chromium](https://byjus.com/chemistry/chromium/) | Cr | 24 |
| [Manganese](https://byjus.com/chemistry/manganese/) | Mn | 25 |
| [Iron](https://byjus.com/chemistry/iron/) | Fe | 26 |
| [Cobalt](https://byjus.com/chemistry/cobalt/) | Co | 27 |
| [Nickel](https://byjus.com/chemistry/nickel/) | Ni | 28 |
| [Copper](https://byjus.com/chemistry/copper/) | Cu | 29 |
| [Zinc](https://byjus.com/chemistry/zinc/) | Zn | 30 |
| [Gallium](https://byjus.com/chemistry/gallium/) | Ga | 31 |
| [Germanium](https://byjus.com/chemistry/germanium/) | Ge | 32 |
| [Arsenic](https://byjus.com/chemistry/arsenic/) | As | 33 |
| [Selenium](https://byjus.com/chemistry/selenium/) | Se | 34 |
| [Bromine](https://byjus.com/chemistry/bromine/) | Br | 35 |
| [Krypton](https://byjus.com/chemistry/krypton/) | Kr | 36 |
| [Rubidium](https://byjus.com/chemistry/rubidium/) | Rb | 37 |
| [Strontium](https://byjus.com/chemistry/strontium/) | Sr | 38 |
| [Yttrium](https://byjus.com/chemistry/yttrium/) | Y | 39 |
| [Zirconium](https://byjus.com/chemistry/zirconium/) | Zr | 40 |
| [Niobium](https://byjus.com/chemistry/niobium/) | Nb | 41 |
| [Molybdenum](https://byjus.com/chemistry/molybdenum/) | Mo | 42 |
| [Technetium](https://byjus.com/chemistry/technetium/) | Tc | 43 |
| [Ruthenium](https://byjus.com/chemistry/ruthenium/) | Ru | 44 |
| [Rhodium](https://byjus.com/chemistry/rhodium/) | Rh | 45 |
| [Palladium](https://byjus.com/chemistry/palladium/) | Pd | 46 |
| [Silver](https://byjus.com/chemistry/silver/) | Ag | 47 |
| [Cadmium](https://byjus.com/chemistry/cadmium/) | Cd | 48 |
| [Indium](https://byjus.com/chemistry/indium/) | In | 49 |
| [Tin](https://byjus.com/chemistry/tin/) | Sn | 50 |
| [Antimony](https://byjus.com/chemistry/antimony/) | Sb | 51 |
| [Tellurium](https://byjus.com/chemistry/tellurium/) | Te | 52 |
| [Iodine](https://byjus.com/chemistry/iodine/) | I | 53 |
| [Xenon](https://byjus.com/chemistry/xenon/) | Xe | 54 |
| [Cesium](https://byjus.com/chemistry/cesium/) | Cs | 55 |
| [Barium](https://byjus.com/chemistry/barium/) | Ba | 56 |
| [Lanthanum](https://byjus.com/chemistry/lanthanum/) | La | 57 |
| [Cerium](https://byjus.com/chemistry/cerium/) | Ce | 58 |
| [Praseodymium](https://byjus.com/chemistry/praseodymium/) | Pr | 59 |
| [Neodymium](https://byjus.com/chemistry/neodymium/) | Nd | 60 |
| [Promethium](https://byjus.com/chemistry/promethium/) | Pm | 61 |
| [Samarium](https://byjus.com/chemistry/samarium/) | Sm | 62 |
| [Europium](https://byjus.com/chemistry/europium/) | Eu | 63 |
| [Gadolinium](https://byjus.com/chemistry/gadolinium/) | Gd | 64 |
| [Terbium](https://byjus.com/chemistry/terbium/) | Tb | 65 |
| [Dysprosium](https://byjus.com/chemistry/dysprosium/) | Dy | 66 |
| [Holmium](https://byjus.com/chemistry/holmium/) | Ho | 67 |
| [Erbium](https://byjus.com/chemistry/erbium/) | Er | 68 |
| [Thulium](https://byjus.com/chemistry/thulium/) | Tm | 69 |
| [Ytterbium](https://byjus.com/chemistry/ytterbium/) | Yb | 70 |
| [Lutetium](https://byjus.com/chemistry/lutetium/) | Lu | 71 |
| [Hafnium](https://byjus.com/chemistry/hafnium/) | Hf | 72 |
| [Tantalum](https://byjus.com/chemistry/tantalum/) | Ta | 73 |
| [Tungsten](https://byjus.com/chemistry/tungsten/) | W | 74 |
| [Rhenium](https://byjus.com/chemistry/rhenium/) | Re | 75 |
| [Osmium](https://byjus.com/chemistry/osmium/) | Os | 76 |
| [Iridium](https://byjus.com/chemistry/iridium/) | Ir | 77 |
| [Platinum](https://byjus.com/chemistry/platinum/) | Pt | 78 |
| [Gold](https://byjus.com/chemistry/gold/) | Au | 79 |
| [Mercury](https://byjus.com/chemistry/mercury/) | Hg | 80 |
| [Thallium](https://byjus.com/chemistry/thallium/) | Tl | 81 |
| [Lead](https://byjus.com/chemistry/lead/) | Pb | 82 |
| [Bismuth](https://byjus.com/chemistry/bismuth/) | Bi | 83 |
| [Polonium](https://byjus.com/chemistry/polonium/) | Po | 84 |
| [Astatine](https://byjus.com/chemistry/astatine/) | At | 85 |
| [Radon](https://byjus.com/chemistry/radon/) | Rn | 86 |
| [Francium](https://byjus.com/chemistry/francium/) | Fr | 87 |
| [Radium](https://byjus.com/chemistry/radium/) | Ra | 88 |
| [Actinium](https://byjus.com/chemistry/actinium/) | Ac | 89 |
| [Thorium](https://byjus.com/chemistry/thorium/) | Th | 90 |
| [Protactinium](https://byjus.com/chemistry/protactinium/) | Pa | 91 |
| [Uranium](https://byjus.com/chemistry/uranium/) | U | 92 |
| [Neptunium](https://byjus.com/chemistry/neptunium/) | Np | 93 |
| [Plutonium](https://byjus.com/chemistry/plutonium/) | Pu | 94 |
| [Americium](https://byjus.com/chemistry/americium/) | Am | 95 |
| [Curium](https://byjus.com/chemistry/curium/) | Cm | 96 |
| [Berkelium](https://byjus.com/chemistry/berkelium/) | Bk | 97 |
| [Californium](https://byjus.com/chemistry/californium/) | Cf | 98 |
| [Einsteinium](https://byjus.com/chemistry/einsteinium/) | Es | 99 |
| [Fermium](https://byjus.com/chemistry/fermium/) | Fm | 100 |
| [Mendelevium](https://byjus.com/chemistry/mendelevium/) | Md | 101 |
| [Nobelium](https://byjus.com/chemistry/nobelium/) | No | 102 |
| [Lawrencium](https://byjus.com/chemistry/lawrencium/) | Lr | 103 |
| [Rutherfordium](https://byjus.com/chemistry/rutherfordium/) | Rf | 104 |
| [Dubnium](https://byjus.com/chemistry/dubnium/) | Db | 105 |
| [Seaborgium](https://byjus.com/chemistry/seaborgium/) | Sg | 106 |
| [Bohrium](https://byjus.com/chemistry/bohrium/) | Bh | 107 |
| [Hassium](https://byjus.com/chemistry/hassium/) | Hs | 108 |
| [Meitnerium](https://byjus.com/chemistry/meitnerium/) | Mt | 109 |
| [Darmstadtium](https://byjus.com/chemistry/darmstadtium/) | Ds | 110 |
| [Roentgenium](https://byjus.com/chemistry/roentgenium/) | Rg | 111 |
| [Copernicium](https://byjus.com/chemistry/copernicium/) | Cn | 112 |
| [Nihonium](https://byjus.com/chemistry/nihonium/) | Nh | 113 |
| [Flerovium](https://byjus.com/chemistry/flerovium/) | Fl | 114 |
| [Moscovium](https://byjus.com/chemistry/ununpentium/) | Mc | 115 |
| [Livermorium](https://byjus.com/chemistry/livermorium/) | Lv | 116 |
| [Tennessine](https://byjus.com/chemistry/ununseptium/) | Ts | 117 |
| [Oganesson](https://byjus.com/chemistry/ununoctium/) | Og | 118 |

Appendix A – Data Dictionary

* ***C++ programming Language. –***

*C++ is a*[*general-purpose programming language*](https://en.wikipedia.org/wiki/General-purpose_programming_language)*created by*[*Bjarne Stroustrup*](https://en.wikipedia.org/wiki/Bjarne_Stroustrup)*as an extension of the*[*C programming language*](https://en.wikipedia.org/wiki/C_(programming_language))*, or "C with*[*Classes*](https://en.wikipedia.org/wiki/Class_(programming))*".*

* ***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*](https://en.wikipedia.org/wiki/Professional_association)*for*[*electronic engineering*](https://en.wikipedia.org/wiki/Electronic_engineering)*and*[*electrical engineering*](https://en.wikipedia.org/wiki/Electrical_engineering)*(and associated disciplines) with its corporate office in*[*New York City*](https://en.wikipedia.org/wiki/New_York_City)[*[4]*](https://en.wikipedia.org/wiki/Institute_of_Electrical_and_Electronics_Engineers#cite_note-:0-4)*and its operations center in*[*Piscataway, New Jersey*](https://en.wikipedia.org/wiki/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.*