PROJECT DOCUMENTATION

Design of Online Periodic Table Using CSS

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1. Title of the Project

Design and Implementation of an Interactive Online Periodic Table Using CSS

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2. Introduction

The periodic table is a fundamental reference in chemistry that organizes chemical elements based on their atomic number, electronic configuration, and recurring chemical properties. Traditional printed periodic tables lack interactivity and adaptability to modern digital devices.

This project focuses on designing an **online interactive periodic table** using **HTML, CSS, and CSS Grid**, providing a visually structured, responsive, and educational platform. The application displays **all 118 chemical elements**, organized in the standard periodic table format, with interactive features for enhanced learning.

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3. Objective of the Project

The primary objectives of this project are:

- To design a web-based periodic table displaying all **118 chemical elements**

- To maintain the **standard periodic table structure**

- To visually differentiate elements using **category-based color coding**

- To provide **interactive element selection**

- To ensure **responsive design** for different screen sizes

- To enhance the educational experience through a clean and intuitive UI

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4. Problem Statement

Many existing digital periodic tables suffer from the following issues:

- Poor mobile responsiveness

- Lack of interactivity

- Overcrowded or confusing layouts

- Limited visual clarity

This project aims to overcome these challenges by implementing a **modern, responsive, and interactive periodic table interface** using CSS Grid and structured web design principles.

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5. Scope of the Project

The scope of this project includes:

- Displaying all known chemical elements

- Visual categorization of elements (metals, non-metals, noble gases, etc.)

- Interactive element information display

- Responsive layout for desktop and mobile devices

The project does **not** include backend integration or real-time data updates and is intended purely for **educational purposes**.

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6. Tools and Technologies Used

Technology	Description
HTML5	Structure of the web page
CSS3	Styling and layout
CSS Grid	Periodic table alignment
JavaScript	Interactivity and dynamic content

Technology	Description
Web Browser	Execution and testing

7. System Design

7.1 Layout Design

- The periodic table is designed using a **10 × 18 CSS Grid**
- Empty grid cells are used to maintain proper spacing
- Lanthanides and actinides are placed separately in dedicated rows

7.2 Color Coding

Elements are categorized and color-coded based on their chemical classification:

- Alkali Metals
- Alkaline Earth Metals
- Transition Metals
- Post-Transition Metals
- Metalloids
- Nonmetals
- Halogens
- Noble Gases
- Lanthanides
- Actinides

8. Algorithm

1. Initialize data for all 118 elements with required properties
2. Define grid positions for correct periodic table placement
3. Create a CSS Grid container (10 × 18)
4. Render element cards dynamically
5. Apply category-based color coding
6. Implement click events for element interaction
7. Display detailed element information in the info panel
8. Apply responsive design using media queries

9. Functional Modules

9.1 Periodic Table Module

- Displays all 118 elements
- Arranged according to atomic number and groups

9.2 Element Card Module

Each element card displays:

- Atomic number
- Chemical symbol
- Element name
- Atomic mass

9.3 Legend Module

- Explains color coding of element categories
- Helps users easily identify element groups

9.4 Information Panel Module

- Displays detailed information of the selected element
- Activated on element click
- Enhances user understanding

10. User Interface Design

- Clean and minimalistic layout
- Consistent color scheme
- Hover effects for better user experience
- Readable typography

- Educational and intuitive interface

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11. Testing

The project was tested for:

- **Functional Testing** – Element interaction and information display
- **UI Testing** – Layout alignment and visual clarity
- **Responsive Testing** – Desktop, tablet, and mobile screens
- **Browser Compatibility** – Chrome, Edge, and Firefox

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12. Result

The final system successfully delivers:

- An interactive online periodic table
  Accurate representation of all 118 elements
- Clear visual categorization
- Responsive and user-friendly interface
- Improved learning experience

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13. Advantages of the System

- Easy to understand and navigate
- Visually engaging
- Mobile-friendly
- Educational and interactive
- Lightweight and fast loading

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14. Future Enhancements

- Search functionality for elements
- Element filtering by category
- Dark mode support

- Quiz or learning mode
- Animation-based transitions

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15. Conclusion

This project demonstrates the effective use of **CSS Grid and modern web design principles** to build a complex educational interface. The online periodic table enhances usability, interactivity, and accessibility while maintaining scientific accuracy, making it a valuable learning tool.

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16. References

- IUPAC Periodic Table

- W3C CSS Grid Documentation

- MDN Web Docs

- Standard Chemistry Textbooks