### **Dynamic Product Filter/Search**

#### **Objective**

To build a dynamic and interactive product filtering system that allows users to search and filter products in real-time based on their input. This system will enhance the user experience by providing instant feedback and relevant product displays.

### **Instructions**

#### **1. HTML Structure**

* **Search Box:**
  + Create an input field at the top of the product grid labeled **"Search Products"**.
  + This input field will serve as the main search box for users to type their search queries.
* **Category Filters:**
  + Add a set of **category filters** (e.g., dropdown menu or clickable buttons) above or beside the search box.
  + Each category or tag should represent a specific product group (e.g., "Electronics," "Clothing," "Home Appliances").
* **Product Grid:**
  + Design a section to display the list of products in a grid format.
  + Each product should include:
    - **Image**: A thumbnail or representative image of the product.
    - **Name**: The name of the product.
    - **Description or Price**: A short description or price of the product.
    - (Optional) **Tags or Categories**: Tags associated with each product for category-based filtering.

#### **2. CSS Styling**

* **Responsive Layout:**
  + Style the product grid to display products in rows and columns.
  + Ensure the layout is responsive for different screen sizes (e.g., desktop, tablet, mobile).
* **Search and Filters Section:**
  + Style the search box and category filters for clarity and accessibility.
  + Highlight active categories or filters for better user interaction.
* **Product Card:**
  + Design individual product cards to make them visually appealing.
  + Include clear borders, spacing, and hover effects to enhance the user experience.

#### **3. JavaScript Functionality**

1. **Real-Time Search Filtering**:
   * Capture user input from the search box using an input event listener.
   * Match the search term against the product names and descriptions.
   * Dynamically display products that match the search term and hide those that do not.
2. **Category-Based Filtering**:
   * Add functionality to allow users to filter products by category or tag:
     + Clicking a category button or selecting an option from a dropdown menu should display only the products associated with that category.
     + Combine the category filter with the search term for more complex filtering (e.g., searching within a selected category).
3. **Reset Filters**:
   * Provide an option (e.g., a "Clear All" button) to reset all filters and display the full product list.
4. **Edge Cases**:
   * Handle cases where no products match the search query or selected category:
     + Display a user-friendly message like **"No products found"**.
   * Ensure proper behavior when the search input is cleared (reset to display all products).

#### **4. User Interactions**

* **Search Input:**
  + When a user types in the search box, the product grid should update instantly to show relevant products.
* **Category Filter:**
  + When a user selects a category or tag:
    - Update the product grid to show only products within that category.
    - Highlight the active category filter for better visibility.
* **Combined Filters:**
  + Allow users to apply both search terms and category filters simultaneously for more precise results.

#### **5. Functional Requirements**

1. **Search Box**:
   * Real-time filtering of products based on user input in the search box.
2. **Category Filters**:
   * Ability to filter products by category or tag.
3. **Dynamic Filtering**:
   * Products should dynamically hide or show based on the applied filters.
4. **Responsive Design**:
   * The product grid and filters should work seamlessly on all device sizes.
5. **No Results Handling**:
   * Display a user-friendly message when no products match the search/filter criteria.

### **Summary**

The goal is to build a visually appealing and user-friendly product filtering system that supports real-time search and category-based filtering. Users should be able to search for products by name or description and narrow their results further using category filters, all while interacting with a responsive and intuitive interface.