**jQuery – Documentation**

jQuery is a **library** built on top of JavaScript to simplify DOM manipulation, event handling, animations, and AJAX operations. It simplifies tasks with concise syntax and built-in methods. Provides simplified methods like $() for selecting and manipulating DOM elements. Has built-in methods like fadeIn(), slideUp(), etc., for animations. jQuery is slightly slower due to the overhead of the library.

**1. DOM Manipulation**

jQuery simplifies DOM (Document Object Model) traversal and manipulation.

**Common Methods:**

* **html()**: Gets or sets the HTML content of elements.
* **text()**: Gets or sets the text content of elements.
* **val()**: Gets or sets the value of form elements.
* **append() / prepend()**: Adds content inside an element (end or beginning).
* **after() / before()**: Inserts content outside an element (after or before).
* **remove()**: Removes an element from the DOM.

**2. HTML Manipulation**

Use jQuery to dynamically update or retrieve HTML content.

**Methods:**

* **attr()**: Gets or sets attributes.
* **removeAttr()**: Removes an attribute.

**3. CSS Manipulation**

Control CSS properties of elements.

**Methods:**

* **css()**: Gets or sets CSS styles.
* **addClass() / removeClass()**: Adds or removes a CSS class.
* **toggleClass()**: Toggles a CSS class on/off.

**4. Selectors**

jQuery selectors are used to find elements in the DOM.

**Common Selectors:**

* **Universal Selector**: $(" \* ") - Select all elements.
* **Class Selector**: $(".myClass") - Select elements by class.
* **ID Selector**: $("#myId") - Select elements by ID.
* **Attribute Selector**: $("[type='text']") - Select elements with attributes.

**5. Events**

Handle user interactions.

**Common Methods:**

* **on()**: Attach event handlers.
* **click()**: Attach a click event.
* **hover()**: Handle mouseenter and mouseleave.
* **submit()**: Trigger actions on form submission.

**6. Effects**

Create animations and effects.

**Common Methods:**

* **show() / hide()**: Display or hide elements.
* **fadeIn() / fadeOut()**: Create fade effects.
* **slideUp() / slideDown()**: Create sliding effects.
* **animate()**: Custom animations.

**7. jQuery Validator**

A plugin for form validation. It consists of rules, messages and submitHandler for performing validation tasks.

**8. Utility Functions**

**$.map():**

Transforms each element of an array or object.

**$.extend():**

Merges objects or arrays.

**$.grep():**

Filters an array.

**$.each():**

Iterates over an array or object.

**9. Deferred and Promise**

Manage asynchronous operations. Consists of methods such as done, fail and always which gets invoked as per the promise resolve or reject.

**10. AJAX**

AJAX (Asynchronous JavaScript and XML) is a technique that allows web pages to update asynchronously by exchanging data with a web server behind the scenes. This means a web page can update parts of itself (e.g., a section or a table) without requiring a full page reload.

**Benefits of Using AJAX**

* **Fast Updates**: Only updates the required parts of the page.
* **Reduced Bandwidth Usage**: Transfers smaller amounts of data compared to reloading an entire page.
* **Improved User Experience**: Enables seamless interactions.

