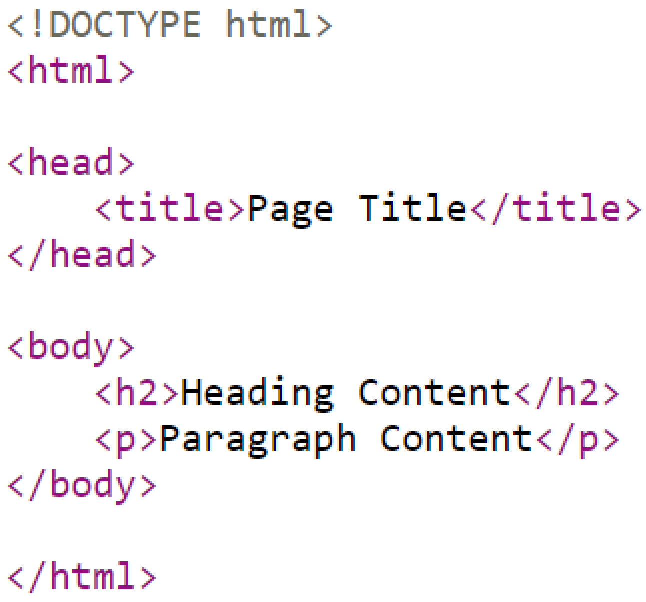
1.What does HTML stand for and what is its purpose?

HyperTextTML, is a set of markup symbols or codes inserted into a file intended for Markup Language, or Hor display on the internet. The markup tells web browsers how words and images should be displayed on a webpage

2. Describe the basic structure of an HTML document.

An HTML Document is mainly divided into two parts:
HEAD: This contains the information about the HTML document including the Title of the page, version of HTML, Meta Data, etc.
BODY: This contains everything you want to display on the Web Page.



```
<!DOCTYPE html>
<html>

<head>
    <title>Page Title</title>
</head>

<body>
    <h2>Heading Content</h2>
    <p>Paragraph Content</p>
</body>

</html>
```

3. What do DOCTYPE and html lang attributes do?

The HTML document type declaration, also known as DOCTYPE , is the first line of code required in every HTML or XHTML document. The DOCTYPE declaration is an instruction to the web browser about what version of HTML the page is written in.
The lang attribute specifies the language of the element's content.
Examples are "en" for English, "es" for Spanish, "fr" for French etc.

4. What is the difference between head and body tags?
The HTML <head> and <body> tags are the two most commonly used tags in HTML. Everything inside the body element is displayed on the web page. But the contents of the head element are not displayed on the page.

5. Can you explain the purpose of meta tags in HTML?

The <meta> tag defines metadata about an HTML document. Metadata is data (information) about data. <meta> tags always go inside the <head> element, and are typically used to specify character set, page description, keywords, author of the document, and viewport settings.

6. How do you link a CSS file to an HTML document?

CSS can be added to HTML documents in 3 ways:
Inline - by using the style attribute inside HTML elements
Internal - by using a <style> element in the <head> section
External - by using a <link> element to link to an external CSS file

7. How do you link a JavaScript file to an HTML document?
To include an external JavaScript file, we can use the script tag with the attribute src . You've already used the src attribute when using images. The value for the src attribute should be the path to your JavaScript file. This script tag should be included between the <head> tags in your HTML document.

8. How do you add a comment in HTML and why would you use them?
An HTML comment begins with <! –– and the comment closes with ––>.
The comment tag is used to insert comments in the source code. Comments are not displayed in the browsers. You can use comments to explain your code, which can help you when you edit the source code at a later date. This is especially useful if you have a lot of code.

9. How do you serve your page in multiple languages?
The returned HTML document should also declare the lang attribute in the <html> tag, such as <html lang="en">... </html> . To let a search engine know that the same content is available in different languages, <link> tags with the rel="alternate" and hreflang="..." attributes should be used.

10. What are data-* attributes and when should they be used?
Attribute data is defined as a type of data that can be used to describe or quantify an object or entity. An example of attribute data is things like colour, , yes/no, gender, etc.The data-* attribute is used to store custom data private to the page or application. The data-* attribute gives us the ability to embed custom data attributes on all HTML elements.

11. What is the difference between b and strong tags?

Both gives visual output same, but bold tag is a physical tag & strong tag is a logical tag. Basically when bold tag is used, it only makes the words thicker... But when strong tag is used, it makes the word thicker & also tells the Browser that the text inside "strong" tag is important

12. When would you use em over i, and vice versa?

The <em> element represents stress emphasis of its contents, while the <i> element represents text that is set off from the normal prose, such as a foreign word, fictional character thoughts, or when the text refers to the definition of a word instead of representing its semantic meaning.

13. What is the purpose of small, s, and mark tags?

The <s> tag specifies text that is no longer correct, accurate or relevant. The text will be displayed with a line through it. The <s> tag should not be used to define deleted text in a document, use the <del> tag for that

The <mark> element is used to highlight text inside of another element such as a paragraph, list, or table. Text to which the <mark> element has been added is considered to be particularly relevant in a specific context.

14. What are semantic HTML tags and why are they important?

Semantic HTML tags are used to define the meaning of the content they contain. Tags like <header>, <article>, and <footer> are semantic HTML tags, they specify the role of the content present on them.

15. How do you create a paragraph or a line break in HTML?

The HTML <p> element defines a paragraph. A paragraph always starts on a new line, and browsers automatically add some white space (a margin) before and after a paragraph.

Use the <br> tag to enter line breaks.

16. How do you create a hyperlink in HTML?

The <a> tag defines a hyperlink, which is used to link from one page to another. The most important attribute of the <a> element is the href attribute, which indicates the link's destination. By default, links will appear as follows in all browsers: An unvisited link is underlined and blue.

17. What is the difference between relative and absolute URLs?

An absolute URL contains all the information necessary to locate a resource. A relative URL locates a resource using an absolute URL as a starting point.

18. How can you open a link in a new tab?

The target attribute of a link element specifies where to open the linked URL. If you set target = "_blank" , the URL will usually open in a new tab. Users can configure their browsers to open links in a new window.

19. How do you create an anchor to jump to a specific part of the page?
step1 :
First, make a title or name to the text you'd like to link on your webpage. Typically, when you create an external hyperlink, you can simply use the URL. Since you're linking to a certain part of your page, it's important to have a title for where the link is going
step2:
After you name the section you'd like to link, insert it into an opening HTML anchor link tag. Adding this tag creates an anchor link, which leads users to the specified section of your webpage. Open your content management system (CMS) and find the webpage in which you'd like to link. Make sure you're in the CMS's code view, so you can edit the page's HTML code. Find where you want to put the link in your text and insert the title you created in the last step into an opening anchor link.
step3:
Once you've created your opening tag, insert it in front of the text you'd like to link to on your webpage. This is where you'd like the link to take the audience after they click on it. Consider using text that directly relates to the content. For instance, you might say "these are the services we provide." Follow the text with a closing tag. Surrounding the text with these tags sets the hyperlink to lead to the specified location.
step4:
Next, go to where you'd like to put the hyperlink, which could be anywhere on the webpage. Write a word or phrase that fits the content of the webpage. Consider making the text a phrase that describes what you're linking to. For instance, you might say "click here to view the cleaning services we provide." Using a descriptive phrase helps users know exactly where the link takes them. To make the link, use an HTML hyperlink markup followed by "#" and the title you created in step one. Add the anchor text and follow it with a closing tag.

20. How do you link to a downloadable file in HTML?

You can use the HTML download attribute to specify that the target will be downloaded when a user clicks on the hyperlink.The download attribute is only used if the href attribute is set.

```
Example:<a href="/images/myw3schoolsimage.jpg" download>

  <img src="/images/myw3schoolsimage.jpg" alt="W3Schools">
```

```
</a>
```

21. How do you embed images in an HTML page?
The HTML <img> tag is used to embed an image in a web page. Images are not technically inserted into a web page; images are linked to web pages. The <img> tag creates a holding space for the referenced image. The <img> tag is empty, it contains attributes only, and does not have a closing tag.

22. What is the importance of the alt attribute for images?
Also called alt tags and alt descriptions, alt text is the written copy that appears in place of an image on a webpage if the image fails to load on a user's screen. This text helps screen-reading tools describe images to visually impaired readers and allows search engines to better crawl and rank your website

23. What image formats are supported by web browsers?
JPEG (Joint Photographic Experts Group):

File extension: .jpg, .jpeg
Advantages: Good compression with minimal loss in image quality, suitable for photographs and complex images.
Considerations: Lossy compression can lead to artifacts if compressed heavily.
PNG (Portable Network Graphics):

File extension: .png
Advantages: Lossless compression, supports transparency (alpha channel), and good for images with sharp edges, text, or graphics.
Considerations: Larger file sizes compared to JPEG, especially for complex images.
GIF (Graphics Interchange Format):

File extension: .gif
Advantages: Supports animations and transparency, suitable for simple animations or graphics with limited colors.
Considerations: Limited to 256 colors per frame, not suitable for photographs or images with gradients.
SVG (Scalable Vector Graphics):

File extension: .svg
Advantages: Vector format, scalable without loss of quality, supports interactivity and animations via CSS and JavaScript.
Considerations: Can be more complex to create and render compared to raster images (JPEG, PNG, GIF).
WebP:

File extension: .webp
Advantages: Developed by Google, offers both lossy and lossless compression, typically results in smaller file sizes compared to JPEG and PNG without significant loss in quality.
Considerations: Browser support may vary, although it is widely supported in modern browsers.

24. How do you create image maps in HTML?
The <map> tag is used to define an image map. An image map is an image with clickable areas. The required name attribute of the <map> element is associated with the <img>'s usemap attribute and creates a relationship between the image and the map.

25. What is the difference between svg and canvas elements?
SVG and Canvas are HTML5 APIs for rendering vector and raster graphics, respectively. SVG is used to create vector-based graphics, whereas Canvas can render both vector and raster graphics. Canvas is better for quickly rendering graphics and animations with less control than SVG.

26. What are the different types of lists available in HTML?
There are three types of lists in HTML
1.Unordered list or Bulleted list (ul)
2.Ordered list or Numbered list (ol)
3.Description list or Definition list (dl)

HTML lists come in three main categories: **unordered lists**, **ordered lists**, and **definition lists**.
Unordered lists are perfect for presenting items that do not have a particular sequence or order.
Ordered lists, as the name suggests, are useful when you want to present items in a specific sequence or order. They are displayed with numbers or letters.
The <dl> tag defines the description list, the <dt> tag defines the term (name), and the <dd> tag describes each term:
Example:

27. How do you create ordered, unordered, and description lists in HTML?
You can do this by using the <ol> tag type attribute.
Example:

```
<html>
<head>
        <title>Description list</title>
```

```
</head>
<body>
<ol>
        <li value="51">English</li>
        <li>Hindi</li>
        <li>Maths</li>
        <li>Science</li>
        <li>social science</li>
    </ol>
<h1>Example of unordered list in default</h1>
    <ul>
        <li>Sachin</li>
        <li>Manoj</li>
        <li>Parth</li>
        <li>sujay</li>
        <li>Amraditya</li>
    </ul>
           <h2>Example of description list</h2>
           <dl>
                      <dt>Python:</dt>
                      <dd>It is a programming language</dd>
                      <dt>C++:</dt>
                      <dd>It is also a programming language</dd>
           </dl>

</body>
</html>
```

28. Can lists be nested in HTML? If so, how?

This is done by embedding a <ul> (unordered) or <ol> (ordered) list inside an <li> (list item) element. The proper way to make a nested HTML list is to use the <ul> or <ol> element as a child of the <li> element it belongs to.

29. What attributes can you use with lists to modify their appearance or behavior?

The list-style-type property of CSS provides greater flexibility in suggesting bullet styles.

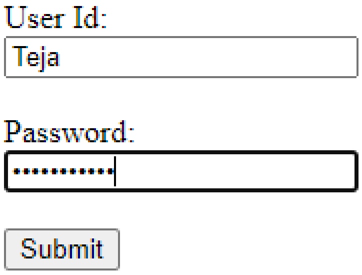
The type attribute defines which type of input control to display and, depending on which type is included, provides for some validation in supporting browsers. The default type is text , displaying a single-line text field, if the type is set to text or if the attribute is not specified.

30. What are HTML forms and how do you create one?

HTML Form is a document that stores information of a user on a web server using interactive controls.

```
<!DOCTYPE html>
<html>
<body>
        <label>User Id: </label> <br>
    1.  <input type="text"> <br> <br>
    2.  <label>Password:</label> <br>
    3.  <input type="password">  <br> <br>
    4.  <input type="submit" value="Submit">
</body>
</html>
```

Op:



User Id:

Teja

Password:

•••••••••••

31. Describe the different form input types in HTML5.

This chapter describes the different types for the HTML <input> element.

- <input type="button">
- <input type="checkbox">
- <input type="color">
- <input type="date">
- <input type="datetime-local">
- <input type="email">
- <input type="file">
- <input type="image">
- <input type="number">
- <input type="password">
- <input type="radio">
- <input type="range">
- <input type="reset">
- <input type="submit">
- <input type="text">

32. How do you make form inputs required?

The required attribute is a boolean attribute.

When present, it specifies that an input field must be filled out before submitting the form.

HTML 'required' Attribute

33. What is the purpose of the label element in forms?
The <fieldset> tag in HTML5 is used to make a group of related elements in the form and it creates the box over the elements.
A <label> is used to create a caption for a form control. The <label> can be associated with a form control either implicitly by placing the control element inside the label element, or explicitly by using the for attribute.
34. How do you group form inputs and why would you do this?
If your form has a series of checkboxes or radio buttons, like a "yes/maybe/no" set of options, it helps users to understand what overall question each of those buttons is answering. This grouping can tie inputs that relate to each other as well, instead of seeming like random inputs.

35. What is new in HTML5 compared to previous versions?
The latest version of HTML5 has come up with some innovative block level elements such as < dialog>,< aside> and <figure>.
The performance of HTML 5 has been widely recognised by the developer community.

36. How do you create a section on a webpage using HTML5 semantic elements?
The <section> element defines a section in a document.
Ex:

```
<!DOCTYPE html>
<html>
<body>

<section>
  <h1>WWF</h1>
  <p>The World Wide Fund for Nature (WWF) is an international organization
working on issues regarding the conservation, research.</p>
</section>
```

```
<section>
  <h1>WWF's Panda symbol</h1>
  <p>The well-known panda logo of WWF originated from a panda named Chi Chi
that was transferred from the Beijing Zoo to the London Zoo in the same year of the
establishment of WWF.</p>
</section>

</body>
</html>
```

37. What is the role of the article element in HTML5?

: The article element represents a section of content that forms an independent part of a document or site; for example, a magazine or newspaper article, or a blog entry.

38. Can you explain the use of the nav and aside elements in HTML5?

(i)The <aside> tag defines some content aside from the content it is placed in.

The aside content should be indirectly related to the surrounding content.

Tip: The <aside> content is often placed as a sidebar in a document.

(ii)The <nav> tag defines a set of navigation links.

Notice that NOT all links of a document should be inside a <nav> element. The <nav> element is intended only for major blocks of navigation links.

Browsers, such as screen readers for disabled users, can use this element to determine whether to omit the initial rendering of this content.

39. How do you use the figure and figcaption elements?

A caption can be associated with the <figure> element by inserting a <figcaption> inside it (as the first or the last child). The first <figcaption> element found in the figure is presented as the figure's caption. The <figcaption> provides the accessible name for the parent <figure>

40. How do you create a table in HTML?

The <table> tag defines an HTML table.

An HTML table consists of one <table> element and one or more <tr>, <th>, and <td> elements. The <tr> element defines a table row, the <th> element defines a table header, and the <td> element defines a table cell.

41. What are thead, tbody, and tfoot in a table?

The <thead> , <tbody> , and <tfoot> elements are used to structure a basic table into semantic sections.
The <tfoot> element represents the foot section of the table, which contains a row ( <tr> ) representing the calculated average of the values in the "Credits" column.
The <thead> element is used in conjunction with the <tbody> and <tfoot> elements to specify each part of a table (header, body, footer).
The <tbody> tag is used to group the body content in an HTML table.

42. What is a colspan and rowspan?

In the rowspan attribute specifies how many rows a table cell should span, determining its vertical position.
The colspan attribute specifies the number of columns a cell should span, determining its horizontal position.

43. How do you make a table accessible?

Tables should include a caption that describes the contents of the table (e.g. Class Schedule). Designate headers (rows and columns). Headings should not contain more than 120 characters.

44. How can tables be made responsive?

The primary method of making a responsive table is to add a class table table-responsive inside the table tag. To make a table responsive, we wrap the whole table inside a container tag like div with property overflow-x equals to auto .

45. How do you add audio and video to an HTML document?

Create a new HTML file in the same directory, called index. html . Add <audio> and <video> elements to the page; make them display the default browser controls. Give both of them <source> elements so that browsers will find the audio format they support best and load it.

46. What are the attributes of the video and audio elements?

The opening <video> and <audio> tags can contain several other attributes including controls , autoplay , loop , mute , preload , and the global attributes.

47. How do you provide subtitles or captions for video content in HTML?

use the <video> element along with the <track> element. The <track> element allows you to specify text tracks for the video, such as subtitles, captions, and descriptions.

48. What is  the difference between embedding and linking media?

-copy of the original file is embedded into the document. As a result, there is no means of checking if the original file is modified at a later date, but the file will be kept with the document when it is moved
- a link is created between the document and the file on disk to allow it to update (via Resource Manager) if changed on disk. The linked file is never stored in the document.

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49. What is a viewport and how can you set it?

The viewport is the visible area of the SVG image. You can set any height and width on an SVG, but the whole image might not be visible. The area that is visible is called the viewport. T

50. Can you describe the use of media queries in HTML?

allow you to create different layouts depending on the size of the viewport, but they can also be used to detect other things about the environment your site is running on.

51. How do you create responsive images with different resolutions for different devices?

When an image is uploaded to a website, it is endowed with default height and width. These need to be changed with CSS.

Simply assign a new value to the image's width property. As a result, the image's height will adjust itself in accordance. Make sure to use relative units (like a percentage) for the width property instead of absolute units like pixels.

```
Example:img {
width: 800px;
}
```

The code above sets a fixed width of 800px. This image won't be responsive as the unit is absolute and won't adjust itself. However, look at the code below:

```
img {
width: 70%;
}
```

With a relative unit like 70% in place, the image will be fluid and resize itself, whatever the screen size.

52. What is responsive web design?

Responsive web design is about creating web pages that look good on all devices!A responsive web design will automatically adjust for different screen sizes and viewports.

Responsive Web Design is about using HTML and CSS to automatically resize, hide, shrink, or enlarge, a website, to make it look good on all devices (desktops, tablets, and phones)

To create a responsive website, add the following <meta> tag to all your web pages.
ex:<meta name="viewport" content="width=device-width, initial-scale=1.0">

This will set the viewport of your page, which will give the browser instructions on how to control the page's dimensions and scaling.

53. How do flexbox and grids help in creating responsive layouts?
Flexbox helps in creating one-dimensional layouts through space distribution and alignment capabilities. Flexbox makes it easier to design responsive layouts without using float or positioning. It has made life much easier for people that use CSS.

Grid is a two-dimensional layout model that helps in creating a layout and aligning items in it. It offers a layout system with rows and columns, making it easier to design web pages without using floats and positioning.

Creating layouts with CSS can be tricky, and it's complicated by the fact that both Flexbox and Grid are used for designing the page layouts. This guide includes some differences between flexbox and grid. We'll see how to decide which one of these to use while designing a layout.
A flex container with three flex items:

```
<div class="flex-container">
  <div>1</div>
  <div>2</div>
  <div>3</div>
</div>
```

Make a grid with 4 columns:

```
.grid-container {
  display: grid;
  grid-template-columns: auto auto auto auto;
}
```

54. What is accessibility and why is it important in web development?
Accessibility is the practice of making your websites usable by as many people as possible. We traditionally think of this as being about people with disabilities, but the practice of making sites accessible also benefits other groups such as those using mobile devices, or those with slow network connections.
It is very important for websites to be accessible to all users. As for general people, they can access almost all websites but people with certain disabilities face problems while accessing a website. Designing and making websites that can be accessed by everybody especially people with disability is a necessity in today’s world. It allows them the same features and functionalities that others can access. Services like online shopping, online banking, health services, government schemes and programs, etc should be accessible to everybody regardless of their condition. Ensuring that everyone has the same access to online content is necessary.

55. How do you make a website accessible?

- HTML Accessibility. Always write HTML code with accessibility in mind! ...
- Semantic HTML. Semantic HTML means using correct HTML elements for their correct purpose as much as possible. ...
- Headings Are Important. ...
- Alternative Text. ...
- Declare the Language. ...
- Use Clear Language.

56. What are ARIA roles and how do you use them?

ARIA roles provide semantic meaning to content, allowing screen readers and other tools to present and support interaction with an object in a way that is consistent with user expectations of that type of object.

57. Explain how to use the tabindex attribute.

When tabindex 's value is set to zero or a positive number, the element can be navigated to via the keyboard's Tab key.

58. How do you ensure your images are accessible?

Every image you embed in your website must include an alt attribute. Not only is this a requirement of the HTML standard, but it also ensures that image content, or the ability to skip it, is available for screen readers. The rule applies whether the image conveys important information or is purely decorative.

59. How do you make a navigation bar in HTML?

To create a navigation bar in HTML, follow these steps:

1. Use the <nav> element to define the navigation bar.
2. Inside <nav>, use an unordered list <ul> to hold the navigation items.
3. Each navigation item is represented by a list item <li>.
4. Inside each <li>, use an anchor <a> tag to create links to different pages or sections of your website.

60. What is  the significance of breadcrumb navigation?

A breadcrumb trail offers navigational cues that help users understand their current location on a website. You can also use breadcrumbs to improve the overall experience as it allows users to easily understand the website hierarchy.

61. How do you create a dropdown menu in HTML?

If we want to make a dropdown menu in the Html document using Form, we have to follow the steps which are given below. Using these steps, we can easily make a dropdown menu:

**Step 1:** Firstly, we have to type the Html code in any text editor or open the existing Html file in the text editor in which we want to use the form for making a dropdown menu.

```
<!Doctype Html>
<Html>
<Head>
<Title>
Make a Drop Down Menu using Html Form
</Title>
</Head>
<Body>
This page helps you to understand how to make a dropdown menu in Html document.
And, this section helps you to understand how to make a drop-down menu using Html form.
</Body>
</Html>
```

**Step 2:** Now, we have to place the cursor at that point in the body tag of the Html document where we want to show the dropdown menu. And, then we have to type the <form> tag at that point.

```
<Body>
This page helps you to understand how to make a dropdown menu in the Html document.
And, this section helps you to understand how to make a drop-down menu using Html form.
<form>


</form>
```

```
</Body>
```

**Step 3:** Now, we have to define the <label> tag and <select> tag between the starting and closing form tag.

```
<form>
<label> Select Cars </label>
<select>

</select>
</form>
```

**Step 4:** Now, we have to define the option tag according to the number of values which are to be shown in the drop-down menu.

```
<form>
<label> Select Cars </label>
<select>
<option value = "BMW"> BMW
</option>
<option value = "Mercedes"> Mercedes
</option>
<option value = "Audi"> Audi
</option>
<option value = "Skoda"> Skoda
</option>
</select>
</form>
```

**Step 5:** And, at last, we have to save the Html file and then run the file.

```
<!Doctype Html>
<Html>
<Head>
<Title>
```

```
Make a Drop Down Menu using Html Form
</Title>
</Head>
<Body>
This page helps you to understand how to make a dropdown menu in Html document.
And, this section helps you to understand how to make a drop down menu using Html form.
<form>
<label> Select Cars </label>
<select>
<option value = "BMW"> BMW
</option>
<option value = "Mercedes"> Mercedes
</option>
<option value = "Audi"> Audi
</option>
<option value = "Skoda"> Skoda
</option>
</select>
</form>
</Body>
</Html>
```

62. Explain the use of the target attribute in a link.

The target attribute specifies where the linked document will open when the link is clicked. The default is the current window. If target="_blank" , the linked document will open in a new tab or (on older browsers) a new window.

63. How do you create a slidedown menu?

Use any element to open the dropdown menu, e.g. a <button>, <a> or <p> element. Use a container element (like <div>) to create the dropdown menu and add the dropdown links inside it. Wrap a <div> element around the button and the <div> to position the dropdown menu correctly with CSS.

64. What are Web Components and how are they used?

A web component is a custom HTML element that you define, with its own tag name. Think of it as an encapsulated, reusable piece of code. Just like regular HTML elements, web components can accept attributes and you can listen for events. Web components are a nice way to add some extra functionality to your web app.

Web Components are a set of low-level browser features that allow us to write modular, encapsulated and reusable HTML elements. Web Components are based on web standards and work in any environment that supports basic HTML and JavaScript. This means that there is no complex setup required for you to get started.

65. What is Shadow DOM and how do you use it?

Shadow DOM works by allowing you to attach a hidden, separate Document Object Model (DOM) to an element. This hidden DOM is known as the 'Shadow DOM', and the element it's attached to is referred to as the 'Shadow Host'.

Shadow DOM stands for Shadow Document Object Model. It's a web standard that allows you to encapsulate the styling and structure of a web component, shielding it from the rest of the document. This encapsulation is achieved by creating a scoped subtree of elements and styles that are hidden from the main document and other components on the page.

Here’s how you use Shadow DOM:

1. **Create a Shadow Root**: You start by creating a shadow root for an element that you want to encapsulate. This is done using the `attachShadow` method available on elements that support Shadow DOM (typically custom elements).

```javascript
const shadowRoot = element.attachShadow({ mode: 'open' });
```

- The `mode` parameter can be `'open'` or `'closed'`:
  - `'open'`: Allows you to access the shadow root using `element.shadowRoot`.
  - `'closed'`: Keeps the shadow root inaccessible from outside.

2. **Define Shadow DOM Content**: Once you have a shadow root, you can populate it with HTML and style it using regular HTML, CSS, and JavaScript. This content will be hidden and scoped to the shadow root.

```javascript
shadowRoot.innerHTML = `
  <style>
    /* Styles specific to the shadow DOM */
    :host {
```

~~~
        display: block;
        padding: 10px;
        background-color: lightgray;
      }
    </style>
    <p>This content is inside the shadow DOM.</p>
  `;
  ```
~~~

3. **Accessing Shadow DOM**: From outside the component, you interact with the element as usual, but the internals of the shadow DOM are not directly accessible.

  ```html
  <my-custom-element></my-custom-element>
  ```

  - Inside `my-custom-element`, the shadow DOM content will render as per the defined structure and styles.

Shadow DOM is particularly useful for creating reusable components without worrying about style conflicts from the main document or other components. It promotes modularization and maintains clean, encapsulated code. This makes it easier to reason about and maintain complex web applications.

66. How do you create a custom HTML element?

Creating a custom HTML element involves using the Custom Elements API, which allows developers to define and register new types of DOM elements. Here's a step-by-step guide on how to create a custom HTML element:

1. **Define the Custom Element Class**:
  - Extend the `HTMLElement` class to define your custom element's behavior and properties.

  ```javascript
  class MyCustomElement extends HTMLElement {
    constructor() {
      super(); // Always call super() first in the constructor.

      // Element initialization code, such as setting up shadow DOM.
      const shadowRoot = this.attachShadow({ mode: 'open' });
      shadowRoot.innerHTML = `
        <style>
          /* Styles specific to the shadow DOM */
          :host {
  ```

```
             display: block;
             padding: 10px;
             background-color: lightgray;
           }
         </style>
         <p>This content is inside the shadow DOM.</p>
       `;
     }

     // Optional: Define custom methods and properties as needed.
   }
   ```

2. **Register the Custom Element**:
   - Use `customElements.define()` to register your custom element with the browser, specifying the element's tag name and its corresponding class.

   ```javascript
   customElements.define('my-custom-element', MyCustomElement);
   ```

3. **Use the Custom Element**:
   - Once registered, you can use your custom element like any other built-in HTML element in your HTML document.

   ```html
   <my-custom-element></my-custom-element>
   ```

4. **Optional: Extend Functionality**:
   - You can add more functionality to your custom element by defining additional methods and properties within the class definition (`MyCustomElement` in this case).

   ```javascript
   class MyCustomElement extends HTMLElement {
     constructor() {
       super();
       const shadowRoot = this.attachShadow({ mode: 'open' });
       shadowRoot.innerHTML = `
         <style>
           :host {
             display: block;
             padding: 10px;
             background-color: lightgray;
   ```

~~~
     }
    </style>
    <p>This content is inside the shadow DOM.</p>
   `;
  }

  // Custom method example
  sayHello() {
   console.log('Hello from my custom element!');
  }

  // Getter/setter example
  get message() {
   return this.getAttribute('message');
  }

  set message(value) {
   this.setAttribute('message', value);
  }
 }

 customElements.define('my-custom-element', MyCustomElement);
 ```
~~~

In summary, creating a custom HTML element involves defining a class that extends `HTMLElement`, registering that class using `customElements.define()`, and then using the custom element in your HTML markup. This approach allows you to encapsulate complex functionality and styling within reusable components, enhancing modularity and maintainability in web development.

### 67. Explain HTML templates and their use cases.

The <template> tag is used as a container to hold some HTML content hidden from the user when the page loads.

The content inside <template> can be rendered later with a JavaScript.

You can use the <template> tag if you have some HTML code you want to use over and over again, but not until you ask for it. To do this *without* the <template> tag, you have to create the HTML code with JavaScript to prevent the browser from rendering the code.

68. How do you use server-sent events?
The EventSource object is used to receive server-sent event notifications:

ex:

```
var source = new EventSource("demo_sse.php");
source.onmessage = function(event) {
  document.getElementById("result").innerHTML += event.data + "<br>";
};
```

Example explained:

- Create a new EventSource object, and specify the URL of the page sending the updates (in this example "demo_sse.php")
- Each time an update is received, the onmessage event occurs
- When an onmessage event occurs, put the received data into the element with id="result"

**69. How do you optimize HTML for search engines?**

- Use semantic tags.
- Optimize your title and meta tags.
- Use heading tags correctly.
- Add alt text to your images.
- Use descriptive links and anchor text.
- Validate and format your code.

**70. What is semantic HTML and how does it relate to SEO?**

semantic HTML plays a crucial role in improving a website's visibility and ranking in search engine results. Semantic SEO focuses on optimizing web content to align with the search intent of users and the semantic understanding of search engines.

**71. Explain the significance of heading tags for SEO**

They rank in order of importance, from H1 to H6, with H1s usually being the title. Header tags improve the readability and SEO of a webpage.

72. How do structured data and schemas enhance SEO?

Structured data, also called schema markup, is code that provides search engines with explicit information about your page that helps them understand its purpose and context. Schema markup can also enhance the look of your search result listing, like by adding stars, which can generate more clicks.

73. What are the best practices for using HTML with SEO?

**1. Use Semantic HTML5 Elements**

- **Semantic HTML**: Use semantic elements (<header>, <nav>, <article>, <section>, <footer>) to structure content for better search engine understanding.
- **Meta Tags**: Optimize <title> and <meta> tags (especially <meta name="description">) with relevant keywords and descriptions.

74. What is the Geolocation API and how is it used?

The HTML Geolocation API is used to get the geographical position of a user. Since this can compromise privacy, the position is not available unless the user approves it. Note: Geolocation is most accurate for devices with GPS, like smartphones.

**75. How do you utilize local storage and session storage in HTML?**

=>Geolocation refers to the use of location technologies such as GPS or IP addresses to identify and track the whereabouts of connected electronic devices. Because these devices are often carried on an individual's person, geolocation is often used to track the movements and location of people and surveillance.

**76. Can you describe the use of the Drag and Drop API?**

HTML Drag and Drop interfaces enable applications to use drag-and-drop features in browsers. The user may select draggable elements with a mouse, drag those elements to a droppable element, and drop them by releasing the mouse button.

**77. What is the Fullscreen API and why would you use it?'**

It is a JavaScript API that you can access via the Document Object Model (DOM) in modern web browsers. While in Fullscreen mode, you can view web content without being distracted by browser user interface (UI) elements like the address bar or toolbar. This API works on a per-element basis.

**78. How do you handle character encoding in HTML?**

The character encoding should be specified for every HTML page, either by using the charset parameter on the Content-Type HTTP response header (e.g.: Content-Type: text/html; charset=utf-8 ) and/or using the charset meta tag in the file. All modern computer languages use the UTF-8 character set a sdefault. The encoding for the early web was ASCII.

**79. What is the lang attribute and its importance in HTML?**

The HTML lang attribute is used to identify the language of text content on the web. This information helps search engines return language specific results, and it is also used by screen readers that switch language profiles to provide the correct accent and pronunciation.

Example :-

```
<html lang="en">
...
</html>
```

**80. How do you accommodate left-to-right and right-to-left language support in HTML?**

If the overall document direction is right-to-left, add dir="rtl" to the html tag. Below the html tag, only use the dir attribute on structural elements on the rare occasions when the base direction needs to change in order for the text to display correctly.

```
<!DOCTYPE html>
<html dir="rtl" lang="ar">
<head>
<meta charset="utf-8">
...
```

**81. How do you validate HTML?**

In order to validate your code, you have to declare the standard to which it adheres. To describe the HTML standard (the document type declaration, DTD), the file should contain a DOCTYPE declaration (before the HTML code).

**82. What are the benefits of using an HTML preprocessor like Pug (Jade)?**

**Simplified Code:** Pug simplifies code structure, making it easier to read and manage. This streamlined approach not only improves load times but also enhances overall performance.

**Reusable Code:** Pug facilitates code reusability through features like mixins, filters, and includes.

**83. How does a templating engine work with HTML?**

A template engine enables you to use static template files in your application. At runtime, the template engine replaces variables in a template file with actual values, and transforms the template into an HTML file sent to the client. This approach makes it easier to design an HTML page.

### 84. What are browser developer tools, and how do you use them with HTML?

Chrome DevTools is a set of web developer tools built directly into the Google Chrome browser. DevTools lets you edit pages on-the-fly and diagnose problems quickly, which helps you build better websites, faster.

These tools do a range of things, from inspecting currently-loaded HTML, CSS and JavaScript to showing which assets the page has requested and how long they took to load.

### 85. What are some common bad practices in HTML?

One of the most basic and frequent HTML errors is forgetting to close a tag, or using the wrong tag to close an element. This can cause unexpected results, such as broken layouts, distorted images, or missing content

1.missing character encoding
2.missing lan attribute
3.improperly formatted tags
4.using head tags outside the head

### 86. How can you ensure that your HTML code follows best practices?

Best Practices

- Separate HTML, CSS, and JavaScript.
- Load data asynchronously, not in templates.
- Load resources using HTTPS.
- Use the HTML5 document type declaration.
- Load JavaScript last.
- Take advantage of jQuery

### 87. What are the benefits of minifying HTML documents?

Minification is the process of minimizing code and markup in your web pages and script files. It's one of the main methods used to reduce load times and bandwidth usage on websites. Minification dramatically improves site speed and accessibility, directly translating into a better user experience.

### 88. How do you optimize the loading time of an HTML page?

- Optimize Image Size and Format. ...
- Optimize Dependencies. ...

- Avoid Inline JS and CSS files. ...
- Optimize Caching. ...
- Avoid render blocking scripts. ...
- Avoid Redirects. ...
- Set up G-Zip Encoding. ...
- Reduce HTTP Requests.

**89. What are some popular CSS frameworks that can be integrated with HTML?**

- Bootstrap.
- Tailwind CSS.
- Semantic UI.
- Bulma.
- Materialize.
- Foundation.
- Pure CSS.

**90. How do frameworks like Bootstrap simplify HTML development?**

Designed to enable responsive development of mobile-first websites, Bootstrap provides a collection of syntax for template designs. As a framework, Bootstrap includes the basics for responsive web development, so developers only need to insert the code into a pre-defined grid system

**91. Can you name some JavaScript libraries that enhance HTML interactivity?**

- jQuery library.
- React library.
- D3.js library.
- Underscore library.
- Lodash library.
- Algolia Places library.
- Anime.js library.

**92. What are data visualizations in HTML and how can they be implemented?**

Data visualization is the process of representing information in a visual form. But more than that, it seeks to present the information so that it can be understood as

quickly and easily as possible. At times, the resulting visuals are simple, amounting to a collection of hand-drawn lines.
There are several methods that can be used to visualization of data in HTML.

1)Simple Data Visualization using <table>

2)Data Visualization using SVGs

**Syntax:**

- <table>
-   <tr>
-     <th>Header cell 1</th>
-     <th>Header cell 2</th>
-   </tr>
-   <tr>
-     <td>Data cell 1</td>
-     <td>Data cell 2</td>
-   </tr>
- </table>

**93. Can you explain how progressive enhancement is applied in HTML?**

Progressive enhancement is a design philosophy that provides a baseline of essential content and functionality to as many users as possible, while delivering the best possible experience only to users of the most modern browsers that can run all the required code

**94. How are HTML, CSS, and JavaScript interconnected in web development?**

Progressive enhancement ensures that websites are developed starting from a baseline of semantic HTML, then progressively enhancing with CSS for styling and JavaScript for interactivity, ensuring accessibility and compatibility across different devices and browsers. This approach prioritizes usability and ensures that all users can access core content and functionality, regardless of their technology constraints.

**95. Discuss the importance of documentation in HTML.**

It helps teams stay organized and on track by providing a clear understanding of project requirements, progress, and any potential risks.
Effective documentation collects all of the must-know information about a task, project, or team (from account logins to step-by-step instructions) in a centralized, organized place.

**96. What updates were introduced in HTML 5.1 and 5.2?**

HTML 5.1 introduced new semantic elements like <main>, <header>, <footer>, Native support with <svg> enhanced form controls with new input types. HTML 5.2 built upon these with additions such as the <dialog> element and improvements to accessibility and security features.

**97. What future updates do you see coming for HTML?**

HTML continues to be a useful content expression language that powers Web growth. It is now time for HTML to mature and grow to support both content driven and layout driven forms in the sensate spaces as well.improving form controls, optimizing media handling, and strengthening security measures.

**98. How does HTML continue to evolve with web standards?**

HTML continues to evolve with web standards through the collaborative efforts of organizations like the W3C and WHATWG. This evolution includes new elements and APIs to support modern web applications, improved semantics for better content structure, enhanced multimedia and form features, and ongoing updates for security, accessibility, and cross-browser compatibility.

**99. What is the Living Standard and how does HTML adhere to it?**

The HTML Living Standard describes exactly how HTML (all the HTML elements, and their associated APIs, and other surrounding technologies) should be implemented.
Building a website using semantically correct HTML will allow the site to appear higher in search results. Following Web Standards when building websites ensures that the code created will be indexed more accurately by search engine bots.

The key elements of a web page structure include the DOCTYPE declaration, HTML tags, head and body sections, and various content elements like headers, paragraphs, links, and images.