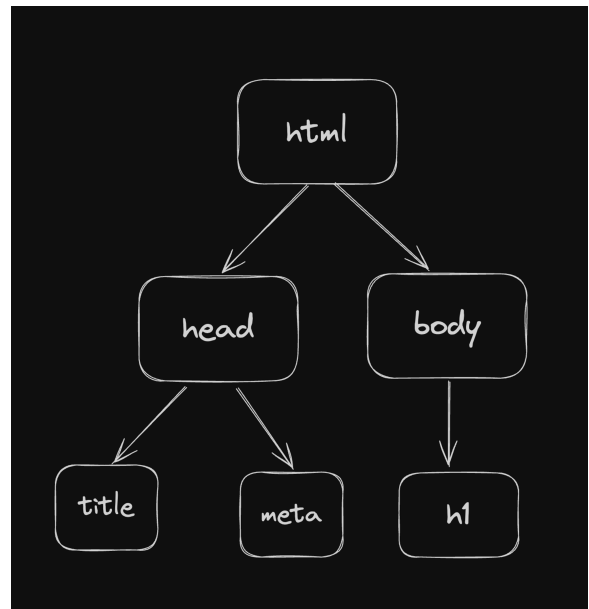


What is DOM?

The DOM, or Document Object Model, is a programming interface for web documents. It represents the structure of a web page as a tree of objects.

```
<html>
  <head>
    <title>Simple app</title>
    <meta name="description" cont
  </head>
  <body>
    <h1>
      hi there
    </h1>
  </body>
</html>
```




Why DOM?

The DOM abstracts the structure of the document into a tree of objects, allowing scripts to manipulate the content and structure dynamically. This abstraction enables more complex interactions and functionalities beyond just static HTML.

Static HTML

As the name suggests, **static HTML** represents HTML that does not change.

For example -



```
<!DOCTYPE html>
<html>
  <head>
    <meta charset="utf-8">
    <meta name="viewport" content="width=device-width">
    <title>replit</title>
    <link href="style.css" rel="stylesheet" type="text/css" />
  </head>

  <body>
    <h1>Todo list</h1>
    <h4>1. Take class</h4>
    <h4>2. Go out to eat</h4>
    <div>
      <input type="text"></input>
      <button>Add Todo</button>
    </div>
    <script src="script.js"></script>
  </body>

</html>
```

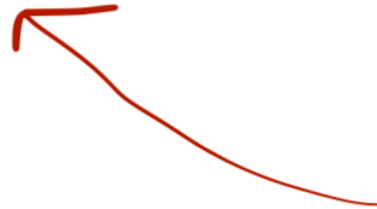
If you click on the **Add Todo** button, nothing happens

Todo list

1. Take class

2. Go out to eat

Add Todo



Dynamic HTML

How can you update the elements of the page **dynamically** ?

Assignment

When the user clicks on the **Add todo** button, a new TODO should be added.

Todo list

1. Take class
2. Go out to eat

document object

In the browser, the **document** object is a fundamental part of the Document Object Model (DOM). It represents the web page currently loaded in the browser and provides a way to interact with and **manipulate** its content.

Fetching elements

There are 5 popular methods available for fetching DOM elements -

- `querySelector`
- `querySelectorAll`
- `getElementById`
- `getElementsByClassName`
- `getElementsByName`

1. Fetching the title

Todo list

1. Take class

2. Go out to eat

```
const title = document.querySelector('h1');  
console.log(title.innerHTML)
```



2. Fetching the first TODO (Assignment)

Todo list

1. Take class

2. Go out to eat

Add Todo

```
const firstTodo = document.querySelector('h4');  
console.log(firstTodo.innerHTML)
```



3. Fetching the **second** TODO (Assignment)

Todo list

1. Take class

2. Go out to eat

Add Todo

```
const secondTodo = document.querySelectorAll('h4')[1];  
console.log(secondTodo.innerHTML)
```



Updating elements

- `.innerHTML` - Used for updating the **HTML** inside an element
- `.textContent` - Used for updating the **text content** inside an element

Assignment - Update the first todo's contents

Todo list

1. Take class

2. Go out to eat

Add Todo

```
const firstTodo = document.querySelector("h4");  
firstTodo.innerHTML = "Dont' take class"
```



Deleting elements

- `removeChild` - Removes a specific **node** of a **parent**
- `onclick` - function that triggers whenever you **click** on a button

Assignment - Add a **delete** button right next to the **todo** that deletes that todo



```
<!DOCTYPE html>
<html>

<head>
  <meta charset="utf-8">
  <meta name="viewport" content="width=device-width">
  <title>replit</title>
  <link href="style.css" rel="stylesheet" type="text/css" />
</head>

<body>
  <h1>Todo list</h1>
  <div>
    <div id="todo-1">
      <h4>1. Take class</h4>
      <button onclick="deleteTodo(1)">delete</button>
    </div>
    <div id="todo-2">
      <h4>2. Go out to eat</h4>
      <button onclick="deleteTodo(2)">delete</button>
    </div>
  </div>
  <div>
    <input type="text"></input>
    <button>Add Todo</button>
  </div>
</body>

<script>
  function deleteTodo(index) {
    const element = document.getElementById("todo-" + index);
    element.parentNode.removeChild(element);
  }
```

```
</script>
```

```
</html>
```

Another experiment we did in class -



```
<html>
  <body id="body">
    <h2>Todo 1</h2>
    <h2>Todo 2</h2>
    <h2>Todo 3</h2>
    <button onclick="deleteRandomTodo()">Delete todo!</button>
  </body>
  <script>
    function deleteRandomTodo() {
      const element = document.querySelector("h2");
      const parentElement = element.parentNode;
      parentElement.removeChild(element);
    }
  </script>
</html>
```

Adding elements

What we're learning -

- createElement
- appendChild

Assignment - Write a function to add a TODO `text` to the list of todos

Steps -

1. Get the current text inside the input element
2. Create a new `div` element
3. Add the `text` from step 1 to the `div` element
4. Append the `div` to the todos list



```
<!DOCTYPE html>
<html>

<head>
  <meta charset="utf-8">
  <meta name="viewport" content="width=device-width">
  <title>replit</title>
  <link href="style.css" rel="stylesheet" type="text/css" />
</head>

<body>
  <h1>Todo list</h1>
  <div id="todos">
    <div id="todo-1">
      <h4>1. Take class</h4>
      <button onclick="deleteTodo(1)">delete</button>
    </div>
    <div id="todo-2">
      <h4>2. Go out to eat</h4>
      <button onclick="deleteTodo(2)">delete</button>
    </div>
  </div>
  <div>
    <input id="inp" type="text"></input>
    <button onclick="addTodo()">Add Todo</button>
```

```
</div>
</body>

<script>
  function addTodo() {
    const inputEl = document.getElementById("inp");
    const textNode = document.createElement("div");
    textNode.innerHTML = inputEl.value;
    const parentEl = document.getElementById("todos");
    parentEl.appendChild(textNode);

  }
</script>

</html>
```

Todo list

1. Take class

delete

2. Go out to eat

delete

hi

hello

hi there

hi there

Add Todo

More complex elements

Until now, we created a simple `div` element

```
const textNode = document.createElement("div");  
textNode.innerHTML = inputEl.value;
```



The problem is it doesn't have a corresponding `delete` button.

1. Take class



Can you try to fix it?

Solution #1

```
<!DOCTYPE html>  
<html>  
  
  <head>  
    <meta charset="utf-8">  
    <meta name="viewport" content="width=device-width">  
    <title>replit</title>  
    <link href="style.css" rel="stylesheet" type="text/css" />  
  </head>  
  
  <body>  
    <h1>Todo list</h1>  
    <div id="todos">  
      <div id="todo-1">  
        <h4>1. Take class</h4>
```



```
        <button onclick="deleteTodo(1)">delete</button>
    </div>
    <div id="todo-2">
        <h4>2. Go out to eat</h4>
        <button onclick="deleteTodo(2)">delete</button>
    </div>
</div>
<div>
    <input id="inp" type="text"></input>
    <button onclick="addTodo()">Add Todo</button>
</div>
</body>

<script>
    let currentIndex = 3;
    function addTodo() {
        const inputEl = document.getElementById("inp");
        const textNode = document.createElement("div");
        textNode.innerHTML = "<div id='todo-" + currentIndex + "'><h4>" + inputEl.va
        const parentEl = document.getElementById("todos");
        parentEl.appendChild(textNode);

        currentIndex = currentIndex + 1;
    }

    function deleteTodo(index) {
        const element = document.getElementById("todo-" + index);
        element.parentNode.removeChild(element);
    }
</script>

</html>
```

Solution #2

```
<html>

<head>
    <meta charset="utf-8">
    <meta name="viewport" content="width=device-width">
    <title>Todo List</title>
    <link href="style.css" rel="stylesheet" type="text/css" />
</head>
```




```
<body>
  <h1>Todo list</h1>
  <div id="todos">
    <div id="todo-1">
      <h4>1. Take class</h4>
      <button onclick="deleteTodo(1)">Delete</button>
    </div>
    <div id="todo-2">
      <h4>2. Go out to eat</h4>
      <button onclick="deleteTodo(2)">Delete</button>
    </div>
  </div>
  <div>
    <input id="inp" type="text">
    <button onclick="addTodo()">Add Todo</button>
  </div>

  <script>
    let currentIndex = 3;

    function addTodo() {
      const inputEl = document.getElementById("inp");
      const todoText = inputEl.value.trim();

      if (todoText === '') {
        alert('Please enter a todo item.');
```

```
        return;
      }

      const parentEl = document.getElementById("todos");

      // Create new todo div
      const newTodo = document.createElement('div');
      newTodo.setAttribute("id", 'todo-' + currentIndex);

      // Create new heading element
      const newHeading = document.createElement('h4');
      newHeading.textContent = currentIndex + '. ' + todoText;

      // Create new button element
      const newButton = document.createElement('button');
      newButton.textContent = 'Delete';
      newButton.setAttribute("onclick", "deleteTodo(" + currentIndex + ")");

      // Append elements to the new todo div
      newTodo.appendChild(newHeading);
```

```
        newTodo.appendChild(newButton);

        // Append new todo to the parent element
        parentEl.appendChild(newTodo);

        // Increment the index for the next todo item
        currentIndex++;

        // Clear the input field
        inputEl.value = '';
    }

    function deleteTodo(index) {
        const element = document.getElementById("todo-" + index);
        if (element) {
            element.parentNode.removeChild(element);
        }
    }
</script>
</body>

</html>
```

Code to debug



```
<html>

<body>
  <input type="text"></input>
  <button onclick="addTodo()">Add todo!</button>
</body>
<script>
  let ctr = 1;
  function deleteTodo(index) {
    const element = document.getElementById(index);
    element.parentNode.removeChild(element);
  }

  function addTodo() {
    const inputEl = document.querySelector("input");
    const value = inputEl.value;

    const newDivEl = document.createElement("div");
    newDivEl.setAttribute("id", ctr);
```

```
    ctr = ctr + 1;
    newDivEl.innerHTML = "<div>" + value + '</div><button onclick="deleteTodo('

    document.querySelector("body").appendChild(newDivEl)
  }
</script>

</html>
```

