

# 20 JavaScript Coding Exercises

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### 1. Change Background Color

Objective: Create a web page with a button that changes the background color of the page when clicked.

```
<!DOCTYPE html>  
<html>  
<head>
```

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```
<title>Change Background Color</title>
</head>
<body>
  <button id="changeColorBtn">Change Background Color</button>
  <script>
    document.getElementById('changeColorBtn').addEventListener('click', function() {
      document.body.style.backgroundColor = 'lightblue';
    });
  </script>
</body>
</html>
```

## 2. Toggle Image Display

Objective: Implement a feature to toggle the visibility of an image when a button is clicked.

```
<!DOCTYPE html>
<html>
<head>
  <title>Toggle Image Display</title>
</head>
<body>
  <button id="toggleImageBtn">Toggle Image</button>
  
  <script>
    document.getElementById('toggleImageBtn').addEventListener('click', function() {
      var img = document.getElementById('toggleImage');
      img.style.display = img.style.display === 'none' ? 'block' : 'none';
    });
  </script>
</body>
</html>
```

## 3. Form Validation

Objective: Create a form that validates an email input field and displays a message if the input is not a valid email address.

```
<!DOCTYPE html>
<html>
<head>
  <title>Form Validation</title>
</head>
```

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```

<body>
  <form id="emailForm">
    Email: <input type="email" id="emailInput">
    <button type="submit">Submit</button>
    <p id="message"></p>
  </form>
  <script>
    document.getElementById('emailForm').addEventListener('submit', function(event) {
    event.preventDefault();
    var email = document.getElementById('emailInput').value;
    var message = "";
    if (!email.includes('@')) {
    message = 'Please enter a valid email address.';
    } else {
    message = 'Email is valid!';
    }
    document.getElementById('message').innerText = message;
    });
  </script>
</body>
</html>

```

#### 4. Fetch and Display Data

Objective: Fetch data from a public API and display the results in a list.

```

<!DOCTYPE html>
<html>
<head>
  <title>Fetch and Display Data</title>
</head>
<body>
  <ul id="dataList"></ul>
  <script>
    fetch('https://jsonplaceholder.typicode.com/posts')
    .then(response => response.json())
    .then(data => {
    const list = document.getElementById('dataList');
    data.forEach(item => {
    const li = document.createElement('li');
    li.textContent = item.title;
    list.appendChild(li);
    });
  });

```

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```
});  
</script>  
</body>  
</html>
```

## 5. Create a To-Do List

Objective: Develop a simple to-do list where users can add items to a list and remove them once completed.

```
<!DOCTYPE html>  
<html>  
<head>  
<title>To-Do List</title>  
<style>  
.todo-item { cursor: pointer; }  
</style>  
</head>  
<body>  
<input type="text" id="todoInput">  
<button id="addTodoBtn">Add To-Do</button>  
<ul id="todoList"></ul>  
<script>  
document.getElementById('addTodoBtn').addEventListener('click', function() {  
var input = document.getElementById('todoInput');  
var itemText = input.value;  
input.value = ""; // Clear input field  
var li = document.createElement('li');  
li.textContent = itemText;  
li.classList.add('todo-item');  
li.addEventListener('click', function() {  
this.parentNode.removeChild(this);  
});  
document.getElementById('todoList').appendChild(li);  
});  
</script>  
</body>  
</html>
```

## 6. Simple Calculator

Objective: Implement a simple calculator that can perform basic arithmetic operations like addition, subtraction, multiplication, and division.

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```

<!DOCTYPE html>
<html>
<head>
  <title>Simple Calculator</title>
</head>
<body>
  <input type="text" id="number1">
  <select id="operation">
    <option value="add">+</option>
    <option value="subtract">-</option>
    <option value="multiply">*</option>
    <option value="divide">/</option>
  </select>
  <input type="text" id="number2">
  <button id="calculateBtn">Calculate</button>
  <p id="result"></p>
  <script>
document.getElementById('calculateBtn').addEventListener('click', function() {
var num1 = parseFloat(document.getElementById('number1').value);
var num2 = parseFloat(document.getElementById('number2').value);
var operation = document.getElementById('operation').value;
var result;
switch(operation) {
case 'add':
result = num1 + num2;
break;
case 'subtract':
result = num1 - num2;
break;
case 'multiply':
result = num1 * num2;
break;
case 'divide':
result = num1 / num2;
break;
}
document.getElementById('result').innerText = 'Result: ' + result;
});
</script>
</body>
</html>

```

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## 7. Countdown Timer

Objective: Create a countdown timer that counts down from a specified time and displays a message when the countdown reaches zero.

```
<!DOCTYPE html>
<html>
<head>
  <title>Countdown Timer</title>
</head>
<body>
  <div id="timer"></div>
  <script>
    var countdownDuration = 10; // 10 seconds for example
    var timerDisplay = document.getElementById("timer");
    var countdown = setInterval(function() {
      timerDisplay.innerText = countdownDuration + ' seconds remaining';
      countdownDuration--;
      if (countdownDuration < 0) {
        clearInterval(countdown);
        timerDisplay.innerText = 'Time is up!';
      }
    }, 1000);
  </script>
</body>
</html>
```

## 8. Interactive Quiz

Objective: Design an interactive quiz with multiple-choice questions. After submitting, show the correct answers and the user's score.

```
<!DOCTYPE html>
<html>
<head>
  <title>Interactive Quiz</title>
</head>
<body>
  <div id="quiz"></div>
  <button id="submitQuizBtn">Submit Answers</button>
  <div id="result"></div>
  <script>
    const questions = [
```

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```

{ question: 'What is 2 + 2?', choices: ['2', '3', '4', '5'], correctAnswer: '4' },
{ question: 'What is the capital of France?', choices: ['Paris', 'London', 'Berlin', 'Madrid'],
correctAnswer: 'Paris' }
];
function displayQuestions() {
const quizContainer = document.getElementById('quiz');
questions.forEach((q, index) => {
const questionDiv = document.createElement('div');
questionDiv.innerHTML = `<p>${q.question}</p>`;
q.choices.forEach(choice => {
questionDiv.innerHTML += `<input type="radio" name="question${index}"
value="${choice}">${choice}<br>`;
});
quizContainer.appendChild(questionDiv);
});
}
document.getElementById('submitQuizBtn').addEventListener('click', function() {
let score = 0;
questions.forEach((q, index) => {
const selectedAnswer =
document.querySelector(`input[name="question${index}"]:checked`)?.value;
if (selectedAnswer === q.correctAnswer) {
score++;
}
});
document.getElementById('result').innerHTML = `You scored ${score} out of
${questions.length}`;
});
displayQuestions();
</script>
</body>
</html>

```

## 9. Dynamic Content Loading

Objective: Dynamically load content into a page section without reloading the page when a button is clicked.

```

<!DOCTYPE html>
<html>
<head>
<title>Dynamic Content Loading</title>
</head>

```

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```

<body>
  <button id="loadContentBtn">Load Content</button>
  <div id="content"></div>
  <script>
    document.getElementById('loadContentBtn').addEventListener('click', function() {
    document.getElementById('content').innerHTML = '<p>New content loaded!</p>';
    });
  </script>
</body>
</html>

```

## 10. Image Slider

Objective: Create an image slider that cycles through a series of images when the next and previous buttons are clicked.

```

<!DOCTYPE html>
<html>
<head>
  <title>Image Slider</title>
  <style>
    .slider { width: 500px; overflow: hidden; }
    .slider img { width: 500px; display: none; }
  </style>
</head>
<body>
  <div class="slider">
    
    
    
  </div>
  <button id="prevBtn">Previous</button>
  <button id="nextBtn">Next</button>
  <script>
    var images = document.querySelectorAll('.slider img');
    var currentImageIndex = 0;
    function showImage(index) {
    images.forEach((img, i) => {
    img.style.display = i === index ? 'block' : 'none';
    });
    }
    document.getElementById('nextBtn').addEventListener('click', function() {
    currentImageIndex = (currentImageIndex + 1) % images.length;

```

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```

showImage(currentImageIndex);
});
document.getElementById('prevBtn').addEventListener('click', function() {
currentImageIndex = (currentImageIndex - 1 + images.length) % images.length;
showImage(currentImageIndex);
});
showImage(currentImageIndex);
</script>
</body>
</html>

```

## 11. Modal Popup

Objective: Create a modal popup that appears when a button is clicked and can be closed with a close button.

```

<!DOCTYPE html>
<html>
<head>
<title>Modal Popup</title>
<style>
.modal { display: none; position: fixed; z-index: 1; left: 0; top: 0; width: 100%; height:
100%; overflow: auto; background-color: rgba(0,0,0,0.4); }
.modal-content { background-color: #fefefe; margin: 15% auto; padding: 20px; border:
1px solid #888; width: 80%; }
</style>
</head>
<body>
<button id="openModalBtn">Open Modal</button>
<div id="myModal" class="modal">
<div class="modal-content">
<span id="closeModalBtn">&times;</span>
<p>Some text in the Modal..</p>
</div>
</div>
<script>
var modal = document.getElementById('myModal');
var btn = document.getElementById('openModalBtn');
var span = document.getElementById('closeModalBtn');
btn.onclick = function() {
modal.style.display = "block";
}
span.onclick = function() {
modal.style.display = "none";

```

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```

}
window.onclick = function(event) {
if (event.target == modal) {
modal.style.display = "none";
}
}
}
</script>
</body>
</html>

```

## 12. Dynamic Select Options

Objective: Dynamically populate a select dropdown with options from an array.

```

<!DOCTYPE html>
<html>
<head>
<title>Dynamic Select Options</title>
</head>
<body>
<select id="dynamicSelect"></select>
<script>
const options = ['Option 1', 'Option 2', 'Option 3'];
const select = document.getElementById('dynamicSelect');
options.forEach(option => {
const opt = document.createElement('option');
opt.value = option;
opt.innerHTML = option;
select.appendChild(opt);
});
</script>
</body>
</html>

```

## 13. Accordion

Objective: Implement an accordion where clicking on a section header expands or collapses the section content.

```

<!DOCTYPE html>
<html>
<head>
<title>Accordion</title>
<style>

```

```

.accordion { background-color: #eee; color: #444; cursor: pointer; padding: 18px; width:
100%; border: none; text-align: left; outline: none; font-size: 15px; transition: 0.4s; }
.active, .accordion:hover { background-color: #ccc; }
.panel { padding: 0 18px; display: none; background-color: white; overflow: hidden; }
</style>
</head>
<body>
<button class="accordion">Section 1</button>
<div class="panel">
<p>Section 1 content...</p>
</div>
<button class="accordion">Section 2</button>
<div class="panel">
<p>Section 2 content...</p>
</div>
<script>
var acc = document.getElementsByClassName("accordion");
for (var i = 0; i < acc.length; i++) {
acc[i].addEventListener("click", function() {
this.classList.toggle("active");
var panel = this.nextElementSibling;
if (panel.style.display === "block") {
panel.style.display = "none";
} else {
panel.style.display = "block";
}
});
}
</script>
</body>
</html>

```

## 14. Filter List

Objective: Implement a search feature that filters through a list of items and shows only those matching the query.

```

<!DOCTYPE html>
<html>
<head>
<title>Filter List</title>
</head>
<body>
<input type="text" id="filterInput" placeholder="Search for names..">

```

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```

<ul id="namesList">
<li>John</li>
<li>Jane</li>
<li>Mike</li>
<li>Mary</li>
</ul>
<script>
document.getElementById('filterInput').addEventListener('keyup', function() {
var input = document.getElementById('filterInput').value.toUpperCase();
var ul = document.getElementById("namesList");
var li = ul.getElementsByTagName('li');
for (var i = 0; i < li.length; i++) {
var txtValue = li[i].textContent || li[i].innerText;
if (txtValue.toUpperCase().indexOf(input) > -1) {
li[i].style.display = "";
} else {
li[i].style.display = "none";
}
}
});
</script>
</body>
</html>

```

## 15. Sort Table

Objective: Create a table that can be sorted by column when the header is clicked.

```

<!DOCTYPE html>
<html>
<head>
<title>Sort Table</title>
</head>
<body>
<table id="sortTable">
<thead>
<tr>
<th onclick="sortTable(0)">Name</th>
<th onclick="sortTable(1)">Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>John</td>

```

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```

<td>25</td>
</tr>
<tr>
<td>Jane</td>
<td>20</td>
</tr>
<tr>
<td>Mike</td>
<td>30</td>
</tr>
</tbody>
</table>
<script>
function sortTable(n) {
var table, rows, switching, i, x, y, shouldSwitch, dir, switchcount = 0;
table = document.getElementById("sortTable");
switching = true;
// Set the sorting direction to ascending:
dir = "asc";
while (switching) {
switching = false;
rows = table.rows;
for (i = 1; i < (rows.length - 1); i++) {
shouldSwitch = false;
x = rows[i].getElementsByTagName("TD")[n];
y = rows[i + 1].getElementsByTagName("TD")[n];
if (dir == "asc") {
if (x.innerHTML.toLowerCase() > y.innerHTML.toLowerCase()) {
shouldSwitch= true;
break;
}
} else if (dir == "desc") {
if (x.innerHTML.toLowerCase() < y.innerHTML.toLowerCase()) {
shouldSwitch = true;
break;
}
}
}
if (shouldSwitch) {
rows[i].parentNode.insertBefore(rows[i + 1], rows[i]);
switching = true;
switchcount ++;
} else {
if (switchcount == 0 && dir == "asc") {

```

```

dir = "desc";
switching = true;
}
}
}
}
</script>
</body>
</html>

```

## 16. Sticky Navigation Bar

Objective: Create a navigation bar that becomes fixed to the top of the viewport when you scroll past it.

```

<!DOCTYPE html>
<html>
<head>
<title>Sticky Navigation Bar</title>
<style>
.navbar { overflow: hidden; background-color: #333; }
.navbar a { float: left; display: block; color: white; text-align: center; padding: 14px 20px;
text-decoration: none; }
.sticky { position: fixed; top: 0; width: 100%; }
</style>
</head>
<body>
<div class="navbar" id="navbar">
<a href="#home">Home</a>
<a href="#news">News</a>
<a href="#contact">Contact</a>
</div>
<script>
window.onscroll = function() {myFunction()};
var navbar = document.getElementById("navbar");
var sticky = navbar.offsetTop;
function myFunction() {
if (window.pageYOffset >= sticky) {
navbar.classList.add("sticky")
} else {
navbar.classList.remove("sticky");
}
}
</script>

```

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```
</body>
</html>
```

## 17. Slideshow

Objective: Develop a slideshow that automatically transitions between images every few seconds.

```
<!DOCTYPE html>
<html>
<head>
  <title>Slideshow</title>
  <style>
    .slideshow-container { max-width: 1000px; position: relative; margin: auto; }
    .mySlides { display: none; }
    .fade { animation-name: fade; animation-duration: 1.5s; }
    @keyframes fade { from {opacity: .4} to {opacity: 1} }
  </style>
</head>
<body>
  <div class="slideshow-container">
    <div class="mySlides fade">
      
    </div>
    <div class="mySlides fade">
      
    </div>
    <div class="mySlides fade">
      
    </div>
  </div>
  <script>
    var slideIndex = 0;
    showSlides();
    function showSlides() {
      var i;
      var slides = document.getElementsByClassName("mySlides");
      for (i = 0; i < slides.length; i++) {
        slides[i].style.display = "none";
      }
      slideIndex++;
      if (slideIndex > slides.length) {slideIndex = 1}
      slides[slideIndex-1].style.display = "block";
      setTimeout(showSlides, 2000); // Change image every 2 seconds
    }
  </script>
</body>
</html>
```

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```
}  
</script>  
</body>  
</html>
```

## 18. Expand/Collapse Content

Objective: Create a section of content that can be expanded or collapsed with a button click.

```
<!DOCTYPE html>  
<html>  
<head>  
<title>Expand/Collapse Content</title>  
</head>  
<body>  
<button onclick="toggleContent()">Show More/Less</button>  
<div id="expandableContent" style="display:none;">  
<p>Here is some more content you can see after you click the button!</p>  
</div>  
<script>  
function toggleContent() {  
var content = document.getElementById("expandableContent");  
if (content.style.display === "none") {  
content.style.display = "block";  
} else {  
content.style.display = "none";  
}  
}  
</script>  
</body>  
</html>
```

## 19. Digital Clock

Objective: Display a live digital clock on the web page that updates every second.

```
<!DOCTYPE html>  
<html>  
<head>  
<title>Digital Clock</title>  
</head>  
<body>  
<div id="digitalClock"></div>  
<script>
```

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```

function showTime() {
var date = new Date();
var h = date.getHours(); // 0 - 23
var m = date.getMinutes(); // 0 - 59
var s = date.getSeconds(); // 0 - 59
var session = h >= 12 ? 'PM' : 'AM';
h = h % 12;
h = h ? h : 12; // the hour '0' should be '12'
m = m < 10 ? '0' + m : m;
s = s < 10 ? '0' + s : s;
var time = h + ":" + m + ":" + s + " " + session;
document.getElementById("digitalClock").innerText = time;
document.getElementById("digitalClock").textContent = time;
setTimeout(showTime, 1000);
}
showTime();
</script>
</body>
</html>

```

## 20. Typing Speed Tester

Objective: Create a simple typing speed tester that measures how quickly the user can type a provided sample text.

```

<!DOCTYPE html>
<html>
<head>
<title>Typing Speed Tester</title>
</head>
<body>
<p id="sampleText">Type this text as fast as you can!</p>
<textarea id="typingArea" rows="10" cols="50"></textarea>
<button id="startBtn">Start</button>
<p id="result"></p>
<script>
document.getElementById('startBtn').addEventListener('click', function() {
var startTime = new Date().getTime();
var sampleText = document.getElementById('sampleText').innerText;
var typingArea = document.getElementById('typingArea');
typingArea.value = "";
typingArea.focus();
typingArea.oninput = function() {
if(typingArea.value === sampleText) {

```

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```
var endTime = new Date().getTime();
var elapsedTime = (endTime - startTime) / 1000; // in seconds
document.getElementById('result').innerText = 'Your time: ' + elapsedTime + ' seconds';
typingArea.oninput = null; // stop the test
}
};
});
</script>
</body>
</html>
```

These exercises are designed to progressively build a learner's JavaScript, HTML, and CSS skills through practical, hands-on coding tasks. They can be used as part of a course curriculum, self-study, or coding practice to reinforce web development concepts.