

1. Write a program to demonstrate JavaScript loops, operators and conditions?

Code :

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Document</title>
</head>

<body>
  <script>
    // Conditional statement to compare two numbers
    let num1 = 10;
    let num2 = 5;

    if (num1 > num2) {
      console.log("Num1 is greater");
    } else if (num1 < num2) {
      console.log("Num2 is greater");
    } else {
      console.log("Num1 and Num2 are equal");
    }

    // While loop
    let i = 1;
    while (i <= 5) {
      console.log("While loop iteration " + i);
      i++;
    }

    // For loop
    for (let j = 1; j <= 5; j++) {
      console.log("For loop iteration " + j);
    }

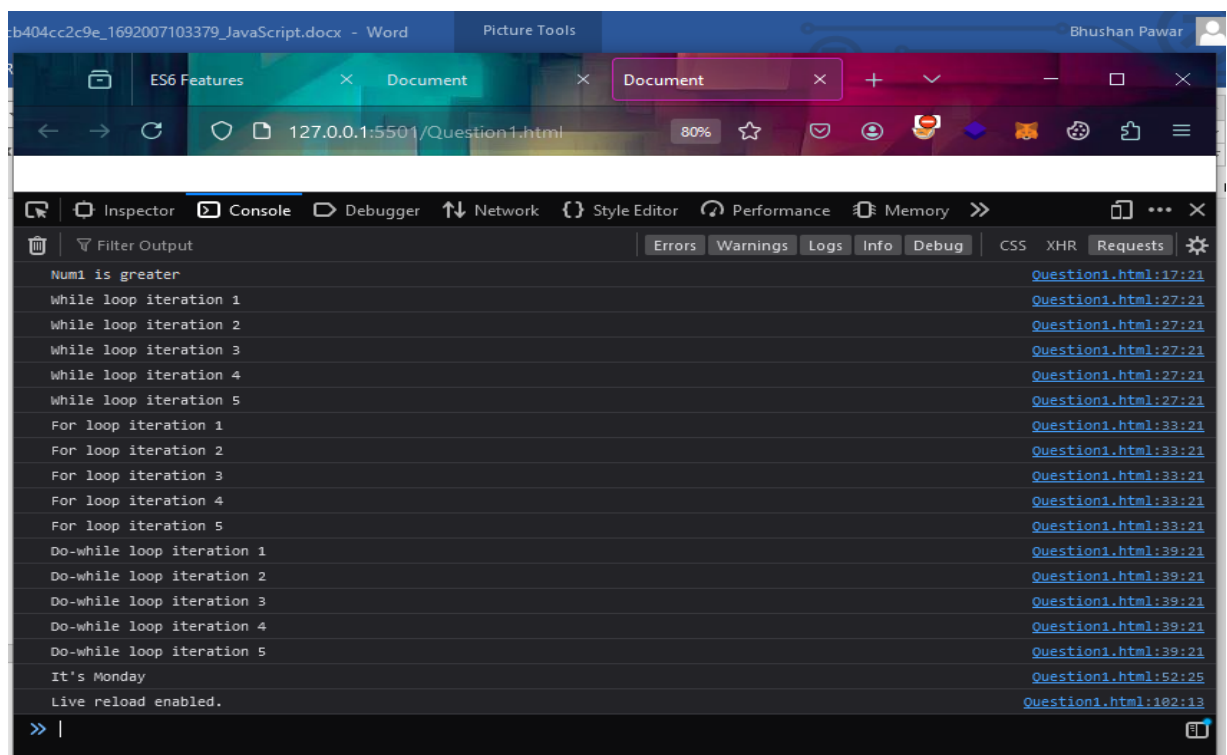
    // Do-while loop
    let k = 1;
    do {
      console.log("Do-while loop iteration " + k);
      k++;
    } while (k <= 5);
    let today = new Date();
    let dayOfWeek = today.getDay();

    switch (dayOfWeek) {
```

```

    case 0:
        console.log("It's Sunday");
        break;
    case 1:
        console.log("It's Monday");
        break;
    case 2:
        console.log("It's Tuesday");
        break;
    case 3:
        console.log("It's Wednesday");
        break;
    case 4:
        console.log("It's Thursday");
        break;
    case 5:
        console.log("It's Friday");
        break;
    case 6:
        console.log("It's Saturday");
        break;
    default:
        console.log("Unknown day");
}
</script>
</body>
</html>

```



2. Write a program to demonstrate different array and string methods in JavaScript?

Code :

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Document</title>
</head>

<body>
  <script>
    // Array methods demonstration
    let array = [1, 2, 3, 4, 5];

    let joinedArray = array.join(" ");
    console.log("Joined String: " + joinedArray);

    array.push(6, 7);
    console.log("After Push: ", array);

    let mappedArray = array.map((x, index) => {
      console.log(index + ":" + x);
      return x + 3;
    });
    console.log("length: " + mappedArray.length);

    array.pop();
    console.log("After Pop: ", array);

    array.shift();
    console.log("After Shift: ", array);

    array.unshift(0);
    console.log("After Unshift: ", array);

    let slicedArray = array.slice(1, 4);
    console.log("Sliced Array: ", slicedArray);

    array.splice(1, 2, 8, 9);
    console.log("After Splice: ", array);

    console.log("Index of 5: " + array.indexOf(5));

    console.log("3 exists in array: " + array.includes(3));

    array.reverse();
```

```

console.log("After Reverse: ", array);

array.sort((a, b) => a - b);
console.log("After Sort: ", array);

let str = "JavaScript is awesome!";

console.log("Uppercase: " + str.toUpperCase());

console.log("Lowercase: " + str.toLowerCase());

console.log("Length: " + str.length);

console.log("Index of 'is': " + str.indexOf('is'));

console.log("Substring: " + str.substring(4, 10));

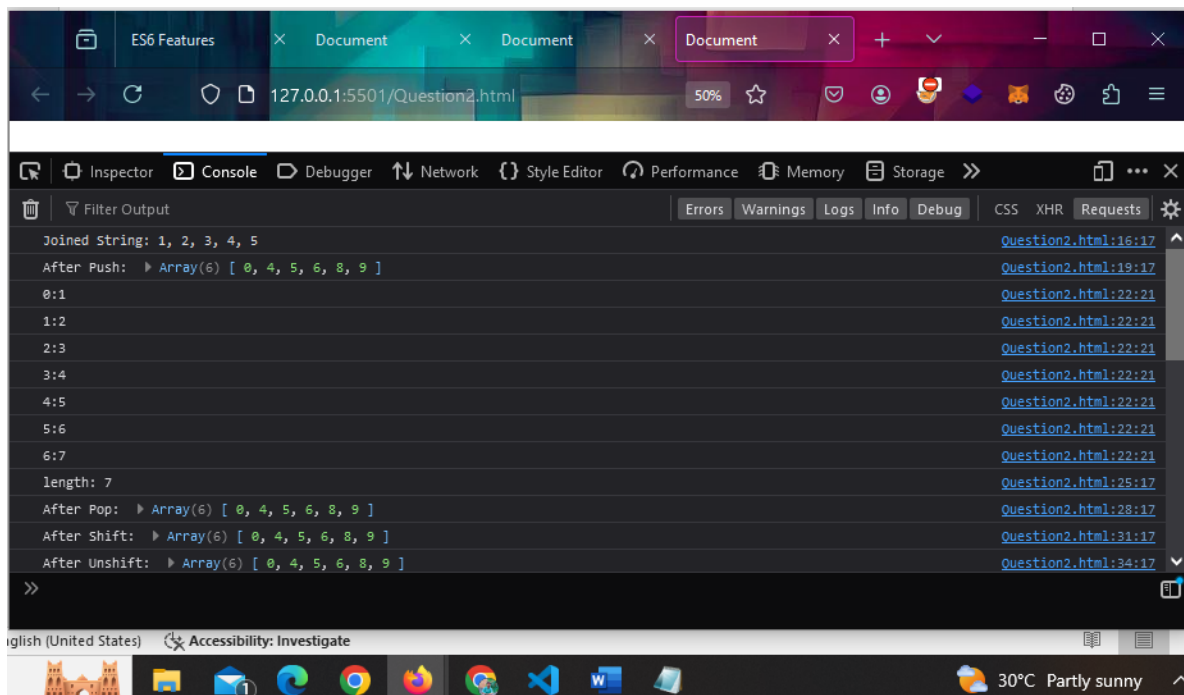
let newStr = str.replace("awesome", "amazing");
console.log("Replaced String: " + newStr);

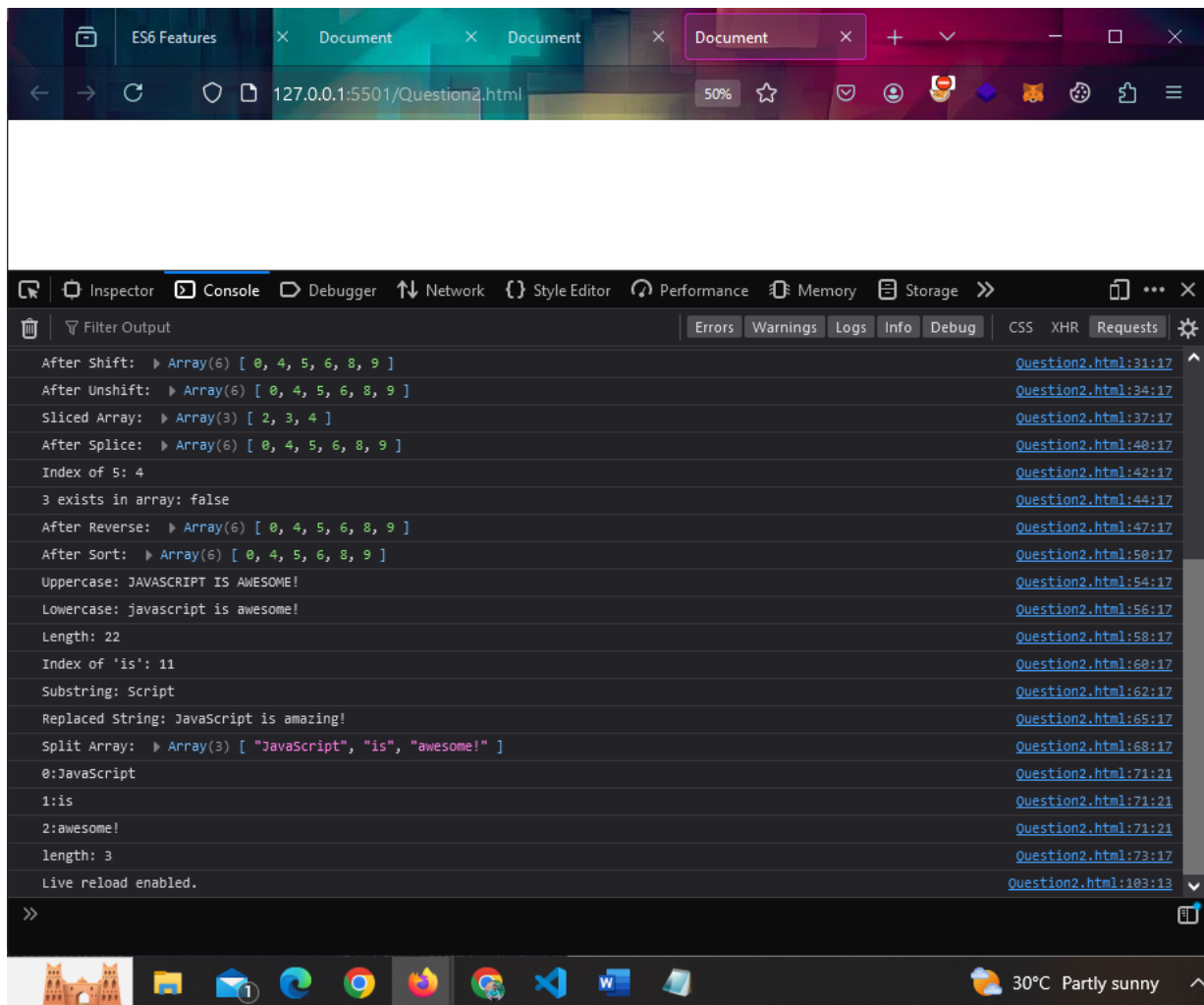
let splitStr = str.split(" ");
console.log("Split Array: ", splitStr);

splitStr.forEach((element, index) => {
    console.log(index + ":" + element);
});
console.log("length: " + splitStr.length);
</script>
</body>

</html>

```





3. Write a program to show different ways to create a function in JavaScript?

```
<!DOCTYPE html>
<html lang="en">

<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Document</title>
</head>

<body>
  <script>
    // Function Declaration
    function greetDeclaration(name) {
      return `Hello, ${name} (Function Declaration)`;
    }
    console.log(greetDeclaration("Alice"));

    // Function Expression
    const greetExpression = function(name) {
      return `Hello, ${name} (Function Expression)`;
    };
    console.log(greetExpression("Bob"));

    // Arrow Function
    const greetArrow = (name) => {
      return `Hello, ${name} (Arrow Function)`;
    };
    console.log(greetArrow("Charlie"));

    // Function Constructor
    const greetConstructor = new Function('name', 'return `Hello, ${name} (Function
Constructor)`;');
    console.log(greetConstructor("Dave"));

    // Immediately Invoked Function Expression (IIFE)
    (function(name) {
      console.log(`Hello, ${name} (IIFE)`);
    })("Eve");

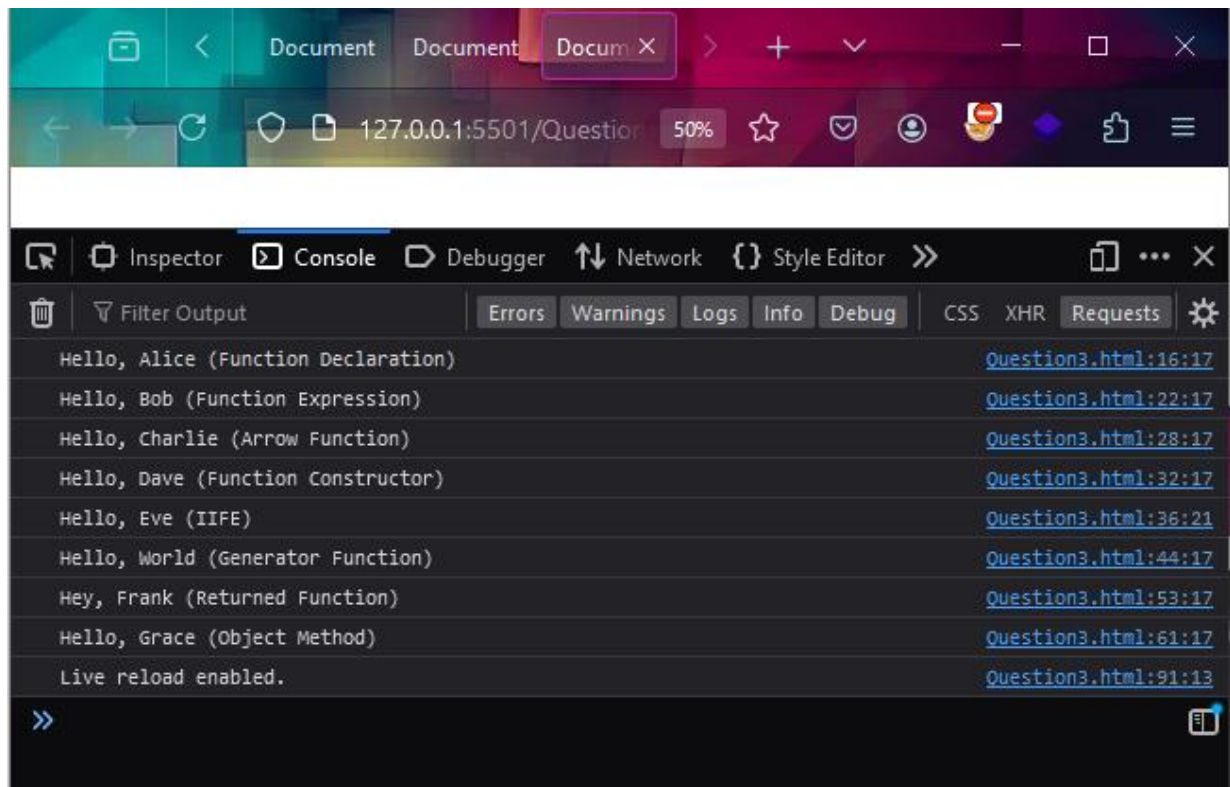
    // Generator Function
    function* greetGenerator() {
      yield "Hello, World (Generator Function)";
    }
    const generator = greetGenerator();
    console.log(generator.next().value);

    // Function that returns another function
    function createGreeter() {
      return function(name) {
```

```
        return `Hey, ${name} (Returned Function)`;
    };
}
const returnedFunction = createGreeter();
console.log(returnedFunction("Frank"));

// Object Method
const obj = {
    greet(name) {
        return `Hello, ${name} (Object Method)`;
    }
};
console.log(obj.greet("Grace"));
</script>
</body>

</html>
```



4. Write a program to implement pomodoro using JavaScript DOM?

Code :

```
<!DOCTYPE html>
<html lang="en">

<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Pomodoro Timer</title>

  <style>
    body {
      background-color: #000;
      color: #fff;
      display: flex;
      flex-direction: column;
      align-items: center;
      justify-content: center;
      height: 100vh;
      margin: 0;
      font-family: Arial, sans-serif;
    }

    .header {
      margin-bottom: 0px;
      font-size: 14px;
      text-align: center;
      color: #838181;
    }

    .labels {
      padding: 15px;
      display: flex;
      justify-content: space-around;
      width: 100%;
      background-color: #222121;
      font-family: Arial, Helvetica, sans-serif;
    }

    .label {
      margin-bottom: 10px;
      margin-top: 10px;
      font-size: 14px;
      text-align: center;
      color: rgb(126, 127, 127);
    }

    .timer {
      font-size: 10rem;
      margin-bottom: 20px;
```



```
    margin-top: 10px;
    color: rgb(255, 255, 255);
}

.controls {
    display: grid;
    grid-template-columns: 1fr 2fr 1fr;
    justify-content: space-around;
    width: 100%;
}

.control1,
.control2 {
    flex: 1;
    display: flex;
    justify-content: center;
    align-items: center;
    font-size: 30px;
    padding: 30px;
    color: white;
    cursor: pointer;
}

.control1 {
    background-color: rgb(83, 83, 83);
}

.control2 {
    background-color: rgb(44, 185, 220);
    border: none;
    font-size: 40px;
}

.buttons {
    display: flex;
    justify-content: space-between;
    width: 100%;
}

.buttons button {
    flex: 1;
    padding: 30px;
    font-size: 30px;
    border: none;
    color: white;
    cursor: pointer;
}

.reset {
    background-color: #e86e0a;
}
```

```

.start {
  background-color: #32CD32;
}

.stop {
  background-color: #FF4500;
  display: none;
}

.reset-active {
  background-color: #ee9b00 !important;
  /* Yellow-Orange color */
}
</style>
</head>

<body>
  <header class="header">Session</header>
  <h1 class="timer">25:00</h1>
  <div class="labels">
    <div class="label">SESSION LENGTH</div>
  </div>

  <div class="controls">
    <button class="control2" id="decrementSession">-</button>
    <span class="control1" id="sessionLength">25</span>
    <button class="control2" id="incrementSession">+</button>
  </div>

  <div class="labels">
    <div class="label">BREAK LENGTH</div>
  </div>

  <div class="controls">
    <button class="control2" id="decrementBreak">-</button>
    <span class="control1" id="breakLength">5</span>
    <button class="control2" id="incrementBreak">+</button>
  </div>

  <div class="buttons">
    <button class="reset" disabled id="resetButton">Reset</button>
    <button class="start" id="startButton">Start</button>
    <button class="stop" id="stopButton">Stop</button>
  </div>

  <script>
    let sessionLength = 25;
    let breakLength = 5;
    let timerInterval;

```

```

let isSession = true;
let timeRemaining = sessionLength * 60;

const timerDisplay = document.querySelector(".timer");
const startButton = document.getElementById("startButton");
const stopButton = document.getElementById("stopButton");
const resetButton = document.getElementById("resetButton");
const decrementSession = document.getElementById("decrementSession");
const incrementSession = document.getElementById("incrementSession");
const decrementBreak = document.getElementById("decrementBreak");
const incrementBreak = document.getElementById("incrementBreak");
const sessionLengthDisplay = document.getElementById("sessionLength");
const breakLengthDisplay = document.getElementById("breakLength");

function updateTimerDisplay() {
    const minutes = Math.floor(timeRemaining / 60);
    const seconds = timeRemaining % 60;
    timerDisplay.textContent = `${minutes.toString().padStart(2, "0")}:${seconds.toString().padStart(2, "0")}`;
}

function startTimer() {
    timerInterval = setInterval(() => {
        timeRemaining--;
        updateTimerDisplay();
        if (timeRemaining === 0) {
            clearInterval(timerInterval);
            if (isSession) {
                isSession = false;
                timeRemaining = breakLength * 60;
                startTimer();
            } else {
                isSession = true;
                timeRemaining = sessionLength * 60;
                startTimer();
            }
        }
    }, 1000);

    startButton.style.display = "none";
    stopButton.style.display = "inline-block";
    resetButton.classList.add("reset-active"); // Add class to change reset button color
    resetButton.disabled = false;
}

function stopTimer() {
    clearInterval(timerInterval);
    startButton.style.display = "inline-block";
    stopButton.style.display = "none";
    resetButton.classList.remove("reset-active"); // Remove class if needed
    resetButton.disabled = false;
}

```

```

}

function resetTimer() {
  clearInterval(timerInterval);
  timeRemaining = sessionLength * 60;
  updateTimerDisplay();
  startButton.style.display = "inline-block";
  stopButton.style.display = "none";
  startButton.disabled = false;
  resetButton.classList.remove("reset-active"); // Remove class if needed
  resetButton.disabled = true;
}

function updateSessionLength(value) {
  sessionLength = value;
  sessionLengthDisplay.textContent = sessionLength;
  if (isSession) {
    timeRemaining = sessionLength * 60;
    updateTimerDisplay();
  }
}

function updateBreakLength(value) {
  breakLength = value;
  breakLengthDisplay.textContent = breakLength;
  if (!isSession) {
    timeRemaining = breakLength * 60;
    updateTimerDisplay();
  }
}

decrementSession.addEventListener("click", () => {
  if (sessionLength > 1) {
    updateSessionLength(sessionLength - 1);
  }
});

incrementSession.addEventListener("click", () => {
  updateSessionLength(sessionLength + 1);
});

decrementBreak.addEventListener("click", () => {
  if (breakLength > 1) {
    updateBreakLength(breakLength - 1);
  }
});

incrementBreak.addEventListener("click", () => {
  updateBreakLength(breakLength + 1);
});

```

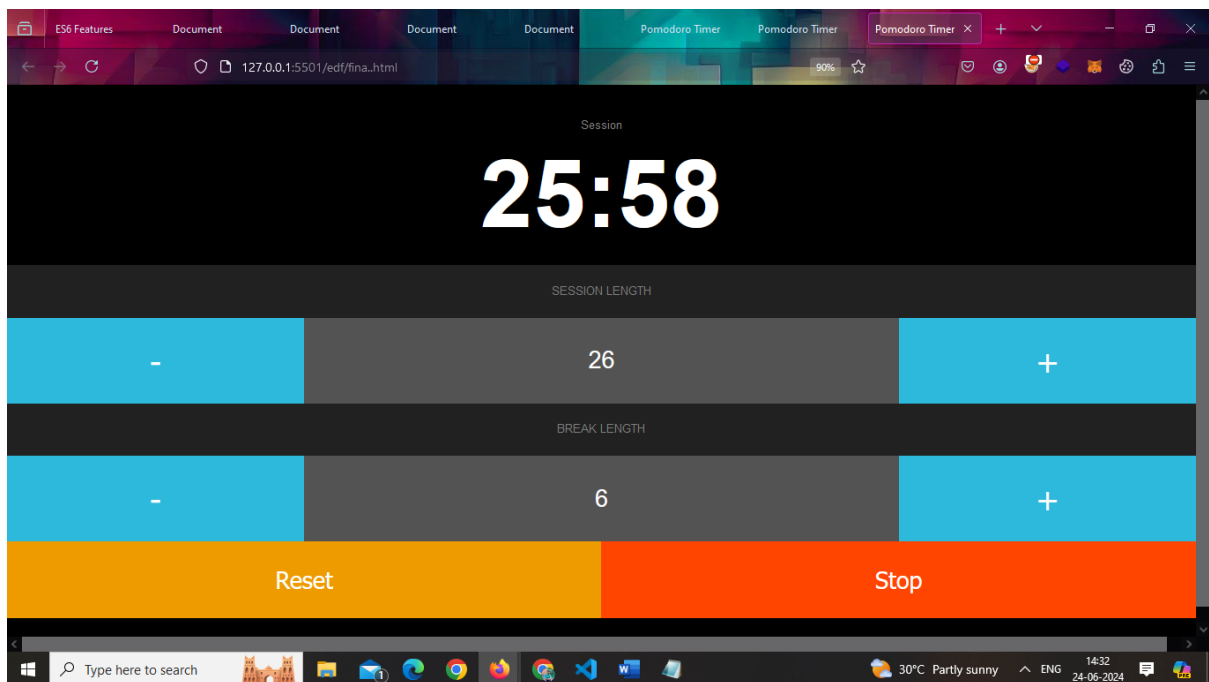
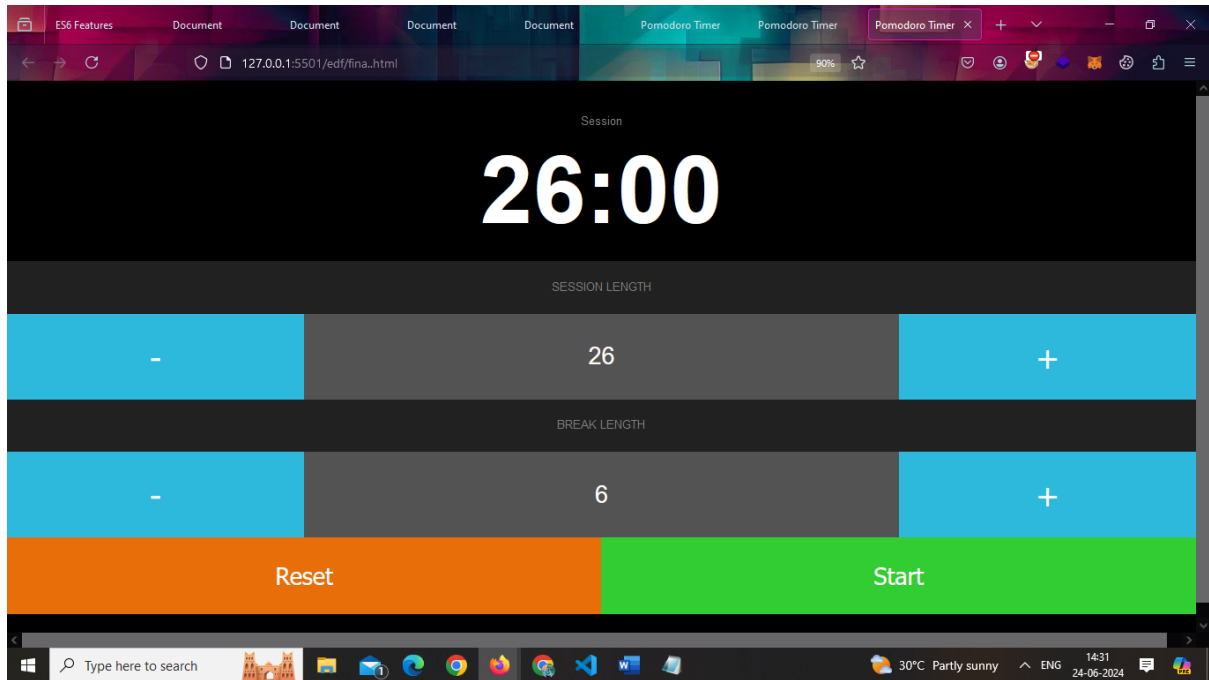
```

startButton.addEventListener("click", startTimer);
stopButton.addEventListener("click", stopTimer);
resetButton.addEventListener("click", resetTimer);

updateTimerDisplay();
</script>
</body>

</html>

```



5. Write a program to implement swap 1 to 9 numbers using drag and drop?

Code:

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Drag and Drop Number Swap</title>
  <link rel="stylesheet" href="styles.css">
  <style>
    .container {
      display: flex;
      justify-content: center;
      align-items: center;
      height: 100vh;
    }

    .grid-container {
      display: grid;
      grid-template-columns: repeat(3, 100px);
      grid-template-rows: repeat(3, 100px);
      background-color: #f0f0f0;
      border: 1px solid #ccc;
      padding: 0px;
    }

    .grid-item {
      display: flex;
      justify-content: center;
      align-items: center;
      font-size: 24px;
      background-color: #ffffff;
      border: 1px solid #ccc;
      cursor: pointer;
    }

    .grid-item:hover {
      background-color: transparent rgb(255, 245, 245);
    }

    .drag-over {
      background-color: darkorange !important;
    }
  </style>
```

```
</head>
```

```
<body>
```

```
  <div class="container">
```

```
    <div class="grid-container" id="gridContainer">
```

```
      <div class="grid-item" id="cell1" draggable="true" ondragstart="drag(event)">1</div>
```

```
      <div class="grid-item" id="cell2" draggable="true" ondragstart="drag(event)">2</div>
```

```
      <div class="grid-item" id="cell3" draggable="true" ondragstart="drag(event)">3</div>
```

```
      <div class="grid-item" id="cell4" draggable="true" ondragstart="drag(event)">4</div>
```

```
      <div class="grid-item" id="cell5" draggable="true" ondragstart="drag(event)">5</div>
```

```
      <div class="grid-item" id="cell6" draggable="true" ondragstart="drag(event)">6</div>
```

```
      <div class="grid-item" id="cell7" draggable="true" ondragstart="drag(event)">7</div>
```

```
      <div class="grid-item" id="cell8" draggable="true" ondragstart="drag(event)">8</div>
```

```
      <div class="grid-item" id="cell9" draggable="true" ondragstart="drag(event)">9</div>
```

```
    </div>
```

```
  </div>
```

```
<script>
```

```
  let draggedItem = null;
```

```
  function allowDrop(event) {  
    event.preventDefault();  
  }
```

```
  function drag(event) {  
    draggedItem = event.target;  
  }
```

```
  function dragEnter(event) {  
    if (event.target.classList.contains('grid-item')) {  
      event.target.classList.add('drag-over');  
    }  
  }
```

```
  function dragLeave(event) {  
    if (event.target.classList.contains('grid-item')) {  
      event.target.classList.remove('drag-over');  
    }  
  }
```

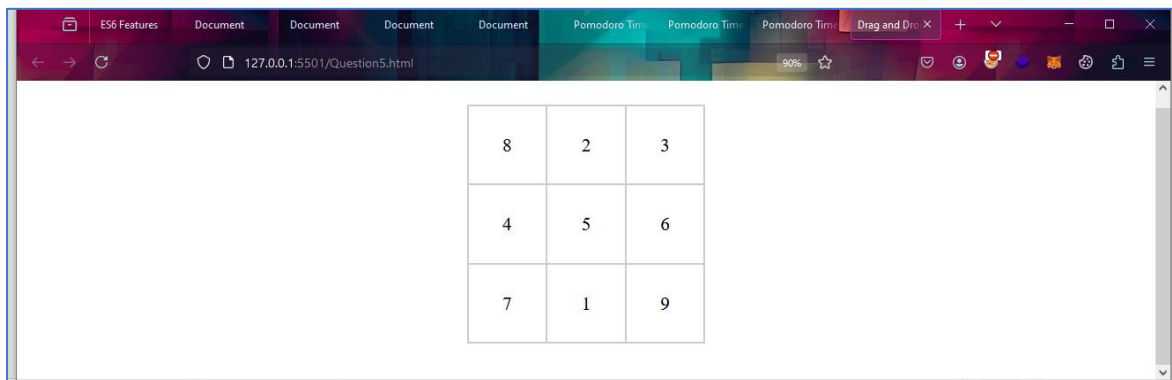
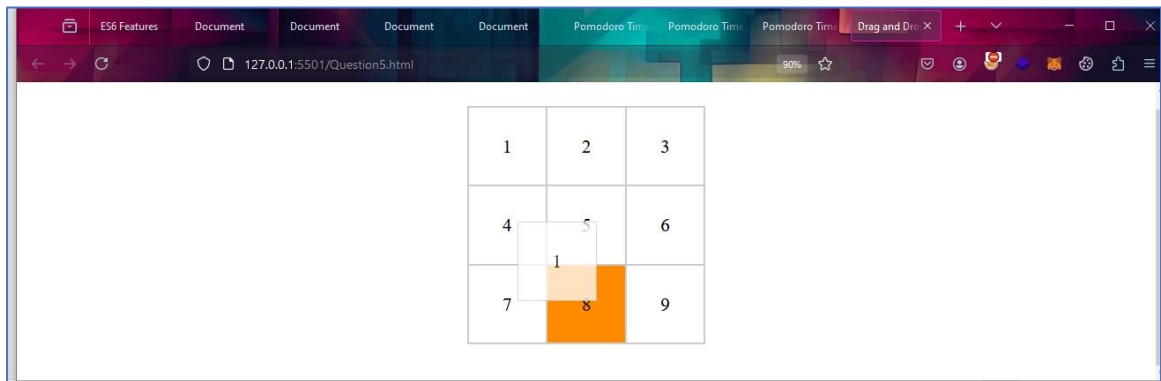
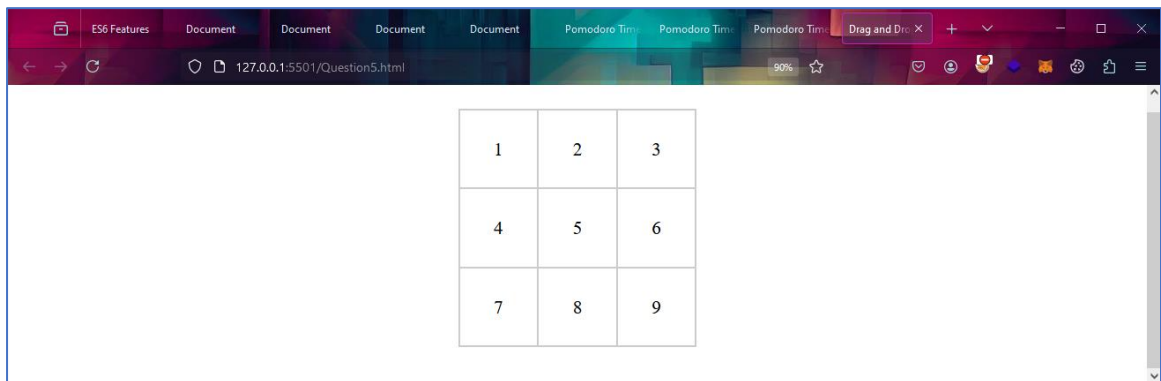
```
  function drop(event) {  
    event.preventDefault();  
    if (draggedItem !== null && event.target.classList.contains('grid-item')) {
```

```
      let temp = event.target.textContent;  
      event.target.textContent = draggedItem.textContent;  
      draggedItem.textContent = temp;
```

```

        event.target.classList.remove('drag-over');
        draggedItem = null;
    }
}
const gridItems = document.querySelectorAll('.grid-item');
gridItems.forEach(item => {
    item.addEventListener('dragover', allowDrop);
    item.addEventListener('dragenter', dragEnter);
    item.addEventListener('dragleave', dragLeave);
    item.addEventListener('drop', drop);
});
</script>
</body>
</html>
Output:

```



6. Demonstrate all ES6 concepts with examples.

```
<!DOCTYPE html>
<html lang="en">

<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>ES6 Features</title>
</head>

<body>
  <script>
    console.log();
    console.log("***** let variable and constant const ***** ")
    let variable = 10; //let variable
    if (true) {
      let variable = 20; // let --> allows you to declare block-scoped variables
      console.log("let variable block-scoped (inside blocked)", variable); // print --> 20
    }
    console.log("Outside blocked let variable", variable); // print --> 10

    const constant = 30; // const variable --> it's allows you to declare block-scoped
constants
    console.log("constant", constant); // print --> 30
    // constant = 40;          // Error: Assignment to constant variable gives error for
reassigning the constant

    console.log();
    console.log("***** Arrow Function *****")
    //Arrow Function --> (ES6 feature)
    const y = (a, b) => a * b;
    console.log("using Arrow Function", y(2, 3)); //6

    const greet = name => `Hello, ${name}`;
    console.log(greet('Alice')); // Hello, Alice

    console.log();
    console.log("***** Rest & spread operator *****")
    // rest operator collects multiple elements into an array
    function sum(...args) {
      return args.reduce((acc, curr) => acc + curr, 0);
    }
    console.log(sum(1, 2, 3)); // 6
```

```

// Spread operator -the spread operatorspread elements of an array or object
const q1 = ["Jan", "Feb", "Mar"];
const q2 = ["APR", "May", "Jun"];
const q3 = ["July", "Aug", "Sep"];
const q4 = ["Oct", "Nov", "Dec"];

const Year1 = q1.concat(q2) //concat at a time 2 array only using concat
console.log(Year1);

const Year = [...q1, ...q2, ...q3, ...q4]; //concat aal four arrays
console.log(Year); // [ "Jan", "Feb", "Mar", "APR", "May", "Jun", "July", "Aug", "Sep",
"Oct", ... ]

//objects
const Student1 = {
  firstname: "John",
  lastName: "n",
  age: 28,
};
const Student2 = {
  RNo: 101,
  Name: "tom",
};

const student = {...Student1,
  ...Student2
};
console.log(student); //Object { firstname: "John", lastName: "n", age: 28, RNo: 101,
Name: "tom" }

//Template literals allow for String interpolation and multi-line strings
console.log();
console.log("***** Template literals *****");
const name = "john";
const greeting = `hello, ${name}!`;
console.log(greeting);

const multiline = `This is
a multiline
string.`
console.log(multiline);

console.log(); //default parameters allow you to set default values for function
parameters
console.log("***** Default parameter *****");

```

```
function multiply(a, b = 1) {
    return a * b;
}
console.log(multiply(5)); // 5
console.log(multiply(5, 2)); // 10
```

```
console.log();
console.log("***** Map & Set Objects
*****");
```

```
const map = new Map();
map.set('key1', 'value1');
map.set('key2', 'value2');
console.log("map object", map.get('key1'));
```

```
const letters = new Set(); // Create a Set
letters.add("a");
letters.add("b");
letters.add("c"); // Add some values to the Set
```

```
console.log("set", letters);
```

console.log(); // class are provide convenient way for creating object and handling inheritance

```
console.log("***** Classes *****");
```

```
class Person {
    constructor(name) {
        this.name = name;
    }
    greet() {
        return `Hello, ${this.name}`;
    }
}
```

```
class Student extends Person {
    constructor(name, studentId) {
        super(name);
        this.studentId = studentId;
    }
    getStudentId() {
        return this.studentId;
    }
}
```

```
const student1 = new Student('Bob', 123);
```

```
console.log(student1.greet()); // Hello, Bob
console.log(student1.getId()); // 123
```

```
console.log();
console.log("*** StringIncludes, Startswith, endswith*** ");
// includes()
const sentence = "The quick brown fox jumps over the lazy dog.";
const word = "fox";
```

```
console.log(`Does the sentence include the word '${word}'?
${sentence.includes(word)}`);
```

```
// startsWith()
const str = "Hello, world!";
const prefix = "Hello";
```

```
console.log(`Does the string start with '${prefix}'? ${str.startsWith(prefix)}`);
```

```
// endsWith()
const suffix = "world!";
console.log(`Does the string end with '${suffix}'? ${str.endsWith(suffix)}`);
```

```
console.log();
console.log("***** Array Methods *****");
// Array.entries()
const array1 = ['a', 'b', 'c'];
const entries = array1.entries();
console.log('Array.entries():');
for (const [index, element] of entries) {
  console.log(index, element); // 0 'a', 1 'b', 2 'c'
}
```

```
// Array.from()
const set = new Set([1, 2, 3]);
const array2 = Array.from(set);
console.log('Array.from():');
console.log(array2); // [1, 2, 3]
```

```
// Array.keys()
const array3 = ['a', 'b', 'c'];
const keys = array3.keys();
console.log('Array.keys():');
for (const key of keys) {
  console.log(key); // 0, 1, 2
}
```

```

}

// Array.find()
const array4 = [5, 12, 8, 130, 44];
const found = array4.find(element => element > 10);
console.log('Array.find():');
console.log(found); // 12

// Array.findIndex()
const array5 = [5, 12, 8, 130, 44];
const foundIndex = array5.findIndex(element => element > 10);
console.log('Array.findIndex():');
console.log(foundIndex); // 1

// Array.forEach()
const array6 = ['a', 'b', 'c'];
console.log('Array.forEach():');
array6.forEach(element => console.log(element)); // 'a', 'b', 'c'

// Array.map()
const array7 = [1, 2, 3];
const mappedArray = array7.map(x => x * 2);
console.log('Array.map():');
console.log(mappedArray); // [2, 4, 6]

// Array.every()
const array8 = [1, 30, 39, 29, 10, 13];
const isBelow40 = array8.every(element => element < 40);
console.log('Array.every():');
console.log(isBelow40); // true

// Array.some()
const array9 = [1, 2, 3, 4, 5];
const hasEvenNumber = array9.some(element => element % 2 === 0);
console.log('Array.some():');
console.log(hasEvenNumber); // true

// Array.reduce()
const array10 = [1, 2, 3, 4];
const sum1 = array10.reduce((accumulator, currentValue) => accumulator +
currentValue, 0);
console.log('Array.reduce():');
console.log(sum1); // 10

console.log();
console.log("***** Promises *****");

```

```

const asyncOperation = new Promise((resolve, reject) => {
  setTimeout(() => {
    resolve('Operation successful');
  }, 1000);
});

asyncOperation
  .then(response => console.log(response)) // Operation successful
  .catch(error => console.error(error));
</script>
</body>

</html>

```

