ENSF-381: Full Stack Web Development Laboratory
Lab04

GitHub Link:

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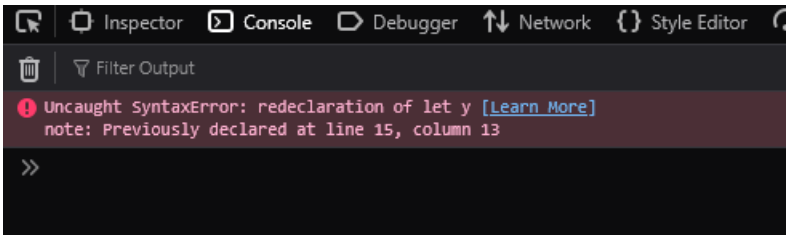
Exercise 1: Exploring JavaScript Fundamentals

1A: Variable Declaration

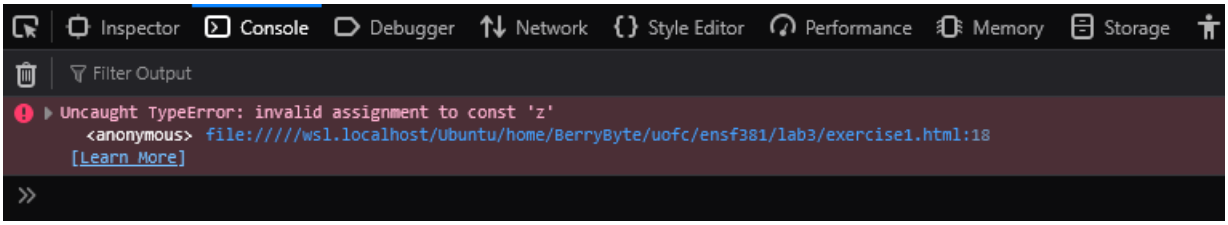
Variable Declarations (var, let, const):

```
        var x = 10;
        let y = 20;
        const z = 30;
```

Observation - Reassigning let:



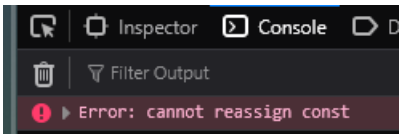
Observation - Reassigning const:



Try...Catch Block Code:

```
        <script>
        var x = 10;
        let y = 20;
        const z = 30;
        try {
            x = 15;
            y = 25;
            z = 35;
        } catch (error) {
            console.error("Error: cannot reassign const")
        }
    </script>
```

Console Output:

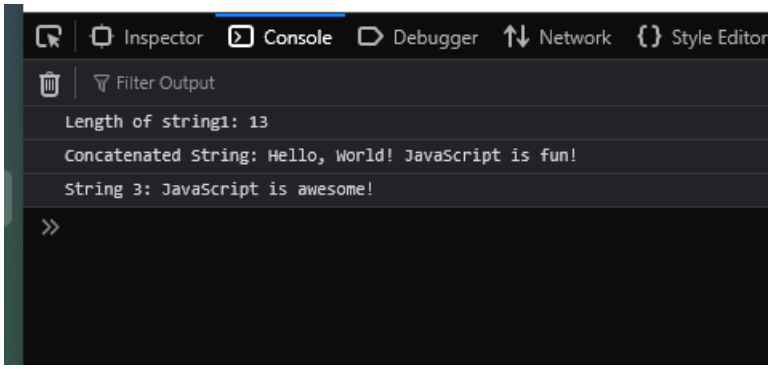


1B: String Operations

Code Implementation:

```
        let string1 = "Hello, World!"
        let string2 = "JavaScript is fun!"

        length1 = string1.length; // Getting the length of string1
        console.log("Length of string1: " + length1);

        concatenatedString = string1 + " " + string2; // Concatenating string1
and string2
        console.log("Concatenated String: " + concatenatedString);

        var string3 = string2.replace("fun", "awesome"); // Replacing "fun" with
"awesome" in string2
        console.log("String 3: " + string3);
```

Console Output:

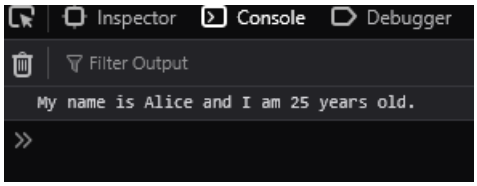


1C: String Templates

Template Literal Code:

```
let name = "Alice"
let age = 25
let message = `My name is ${name} and I am ${age} years old.`
console.log(message)
```

Console Output:

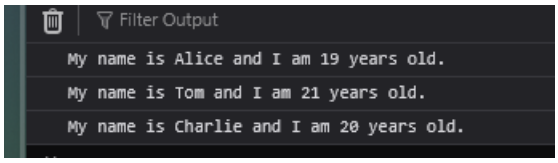


1D: Iteration

Loop Implementation:

```
const students = ["Alice", "Tom", "Charlie"]
const ages = [19, 21, 20]

for (let index = 0; index < students.length; index++) {
    const student = students[index];
    const age = ages[index];
    console.log(`My name is ${student} and I am ${age} years old.`);
}
```

Console Output:

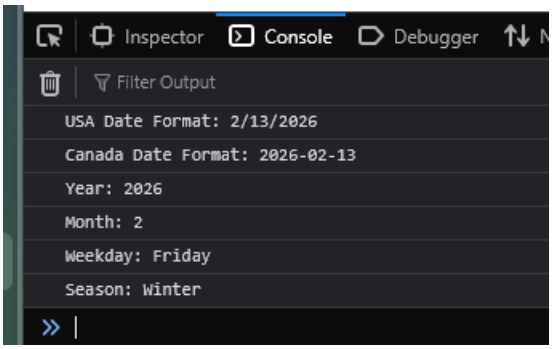


1E: Working with Dates

Date Code:

```
    year = current_date.getFullYear();
    month = current_date.getMonth() + 1; // Months are zero-indexed, so 1 for
correction
    weekday = current_date.toLocaleDateString('en-US', { weekday: 'long' }); //
weekday name in English
    season = (month >= 3 && month <= 5) ? "Spring" :
             (month >= 6 && month <= 8) ? "Summer" :
             (month >= 9 && month <= 11) ? "Autumn" : "Winter";

    console.log("Year: " + year);
    console.log("Month: " + month);
    console.log("Weekday: " + weekday);
    console.log("Season: " + season);
```

Console Output:



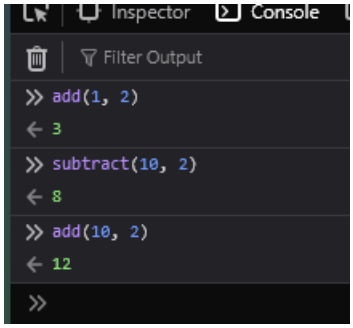
Exercise 2: Building a Simple Calculator

2A: Declaring Functions

Function Definitions (add and subtract):

```
     function add(a, b){
    return a + b;
}
function subtract(a, b){
    return a - b;
}
```

Test Results:



2B: Using Default Parameters

Modified Functions:

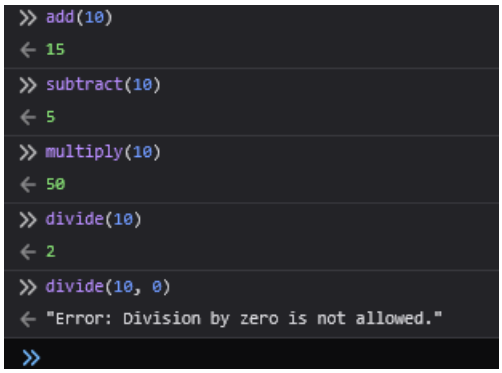
```
function add(a, b=5){
    return a + b;
}
function subtract(a, b=5){
    return a - b;
}
```

Observation:

2C: Implementing Arrow Functions

```
    // arrow syntax
    const add = (a, b=5) => a + b;
    const subtract = (a, b=5) => a - b;
    const multiply = (a, b=5) => a * b;
    const divide = (a, b=5) => b === 0 ? "Error: Division by zero is not
allowed." : a / b;
```

Observation:



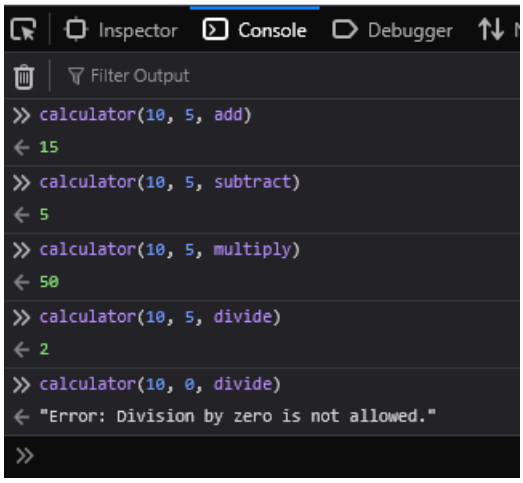
2D: Understanding Callback Functions

Calculator Function Code:

```
    <h1>JavaScript Lab Exercise 2</h1>
    <script>
    /*
    function add(a, b=5){
        return a + b;
    }
    function subtract(a, b=5){
        return a - b;
```

```
    }

    */

    // arrow syntax
    const add = (a, b=5) => a + b;
    const subtract = (a, b=5) => a - b;
    const multiply = (a, b=5) => a * b;
    const divide = (a, b=5) => b === 0 ? "Error: Division by zero is not
allowed." : a / b;

    function calculator(num1, num2, operation) {
        return operation(num1, num2);
    }
```

Test Results:



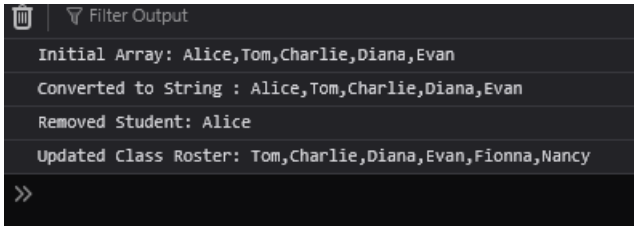
Exercise 3: Managing Data with JavaScript

3A: Arrays and Basic Methods

Array Code:

```
let classRoster = ["Alice", "Tom", "Charlie", "Diana", "Evan"];
console.log("Initial Array: " + classRoster);

// To string
classRoster = classRoster.toString();
console.log("Converted to String : " + classRoster);

// To array
classRoster = classRoster.split(",");

classRoster.push("Fionna");
classRoster.push("Nancy");

removedStudent = classRoster.shift();    // Remove Alice
console.log("Removed Student: " + removedStudent);


console.log("Updated Class Roster: " + classRoster);
```

Console Outputs:



3B: Objects with Nested Structures

Object Code:

```
//    --- ENSF 381 -- Lab 3 Exercise 3, A ---

let classRoster = ["Alice", "Tom", "Charlie", "Diana", "Evan"];
//console.log("Initial Array: " + classRoster);

// To string
//classRoster = classRoster.toString();
//console.log("Converted to String : " + classRoster);

// To array
//classRoster = classRoster.split(",");

classRoster.push("Fionna");
classRoster.push("Nancy");

removedStudent = classRoster.shift();    // Remove Alice
//console.log("Removed Student: " + removedStudent);


//console.log("Updated Class Roster: " + classRoster);


//    --- ENSF 381 -- Lab 3 Exercise 3, B ---
classInfo = Object();
classInfo.className = "ENSF381: Full-Stack Web Development";
classInfo.instructor = "Dr. Smith";
classInfo.students = classRoster;
classInfo.details = Object();
    classInfo.details.semester = "Winter";
    classInfo.details.year = 2026;
classInfo.schedule = ["Monday", "Wednesday", "Friday"];

classInfo.instructor = "Dr.  Abdellatif" // Update instructor name

console.log("Class Name: " + classInfo.className);
console.log("Instructor: " + classInfo.instructor);
console.log("Students: " + classInfo.students);
console.log("Semester: " + classInfo.details.semester);
console.log("Year: " + classInfo.details.year);
```

```
console.log("Schedule: " + classInfo.schedule);

// Destructuring
// className and students into variables
const { className, students } = classInfo;
console.log("Destructured Class Name: " + className);
console.log("Destructured Students: " + students);

// semester and year into variables
const { details: { semester, year } } = classInfo;
console.log("Destructured Semester: " + semester);
console.log("Destructured Year: " + year);

// first 2 students into variables
const [student1, student2, ...remainingStudents] = students;
console.log("First Student: " + student1);
console.log("Second Student: " + student2);
console.log("Remaining Students: " + remainingStudents);
```

Console Outputs: