COMP 9782 Programming Fundamentals

Lab-4-2 - JavaScript fundamental hands-on exercises. (8% of the course mark)

Name:

Student Number:

The JavaScript Fundamentals Lab is a hands-on workshop designed to provide participants with a foundational understanding of JavaScript programming. Through practical exercises, participants will learn key concepts, syntax, and best practices in JavaScript, enabling them to build interactive and dynamic web applications.

Lab objectives:

1. Familiarize participants with functions.
2. Understand arrays, objects, and maps.
3. Gain proficiency in loop structures for, for of, for in and forEach.

Lab Prerequisite:

1. **Download** and **extract** the **Lab-4-2.zip** file from **D2L**.
2. **Navigate** to the **directory** where the **files** were **extracted**.
3. Enter the **developer name** as well as the **purpose** on each **HTML**, **CSS, and JavaScript** file used in this lab.

Functions

1. Navigate to **./assets/js** and open **05Functions.js**.
2. Read the **Coding tasks** below and write the **JavaScript code** in **between** the **Coding task start** and **end**.

a. **Coding task 1**:
    i. Create a function named **showDate**, this function displays the **current date** on the **browser console** by using the **new Date()** object.
    ii. Call the function **showDate()** to verify it works.
b. **Coding task 2**:
    i. Create a function named **displayUpper** which accepts a **string parameter** named **stringToDisplay**, this function displays on the browser console the **uppercase** version of the string parameter **stringToDisplay**.
    ii. Call the function **displayUpper** with a string parameter of your choice after the function declaration to verify it works.
c. **Coding task 3**:
    i. Create a function named **substractNumbers**, which accepts **2 number parameters** named **x** and **y**.
    ii. This function **returns** the **difference between x** and **y number parameters**.
    iii. Call the function **substractNumbers** with 2 number parameters of your choice after the function declaration to verify it works (Output should be visible on the browser console).
d. **Coding task 4**:
    i. Create a function named **addAllNumbers**, which accepts an **array** of **numbers** called **numbersToAdd**. This function will **loop through** the **numbersToAdd array** and **return** the **sum** of all the **elements** of the **numbersToAdd array**.
    ii. Call the function **addAllNumbers** with an array of numbers parameter of your choice after the function declaration to verify it works (Output should be visible on the browser console).

Arrays

1. Navigate to **./assets/js** and open **07Arrays.js**.
2. Read the **Coding tasks** below and write the **JavaScript code** in **between** the **Coding task start** and **end**.
    a. **Coding task 1**:
        i. Create an array named: **studentCourseInformation**, this array contains objects.
        ii. Below are the object properties.
            1. studentId: number
            2. studentFirstName:string
            3. studentLastName:string
            4. courses: array of course objects.

Sample object values:

```
{
 studentId: 12345,
 studentFirstName: "Steve",
 studentLastName: "Jobs",
 courses: [
  { code: "PSY101", title: "College Physics" },
  { code: "CHM101", title: "Organic Chemistry" },
 ],
}
```

        iii. Populate the **studentCourseInformation** array with at least **5 objects**.
        iv. **Add another object** using the **push function**.
        v. Use **console.log** to display the value of the **pop function**.
        vi. Use a **for loop** to **display** the **studentId**.
        vii. Use a **for of loop** to **display** the **studentFirstName**.
        viii. Use a **forEach** to **display** the **studentLastName**.

b. **Coding task 2**:

   i. Given an array **numbersToSort** = [49396, 59735, 54355, 56009, 70448, 4501, 93610, 80034, 65747, 66400, 91527, 56762, 2601, 64799, 95122, 80412, 4244, 5774, 85034, 44074]

   ii. Write a sort function to sort in ascending order.

   iii. Write a sort function to sort in descending order.

Objects

1. Navigate to **./assets/js** and open **08Objects.js**.
2. Read the **Coding tasks** below and write the **JavaScript code** in **between** the **Coding task start** and **end**.
    a. **Coding task 1**:
        i. Create an object named Vehicle.
        ii. Add the following properties to the Vehicle object with the following values:

Property	Value
make	Toyota
model	Corolla
year	2023
color	Black
engineStatus	false

        iii. Add the following methods.

Method	Description
startEngine()	1. If the **engineStatus** is **false** a. Display the **make** and **model** and the **text** that says that it is now running (See output below). i. **Toyota Corolla engine is now running**. b. **Set** the **engineStatus** to **true**. 2. else a. Display the **make** and **model** and the **text** that says that it is already running (See output below). i. **Toyota Corolla engine is already running**.
stopEngine()	3. If the **engineStatus** is **true** a. Display the **make** and **model** and the **text** that says that it is now turned off (See output below).

	i. **Toyota Corolla engine is now turned off**. b. Set the **engineStatus** to **false**. 4. else a. Display the **make** and **model** and the **text** that says that it is already turned off (See output below). i. **Toyota Corolla engine is already turned off**.

iv. Do the following function calls and verify if it works.

1. Call **startEngine()**
2. Call **stopEngine()**
3. Call **startEngine() twice**
4. Call **stopEngine() twice**

Maps

1. Navigate to **./assets/js** and open **09Maps.js**.
2. Read the **Coding tasks** below and write the **JavaScript code** in **between** the **Coding task start** and **end**.
    a. **Coding task 1**:
        i. Create a new Map() named:**ontarioCollegeMap**, with the following key and values.

Key	Value
GBC	George Brown College
SENECA	Seneca College
HUMBER	Humber College
CENT	Centennial College
SHER	Sheridan College
DUR	Durham College

        ii. Use a forEach, for in, or for in loop to display the key and values.