CET-223

Web Technologies

Experiment # 07

Experiment Title

JavaScript Fundamentals: Understanding Variables, Data Types, and Control Structures

Assessment of CLO(s): 03

Performed on _____

Student Name:			
Roll No.		**Group**	
Semester		**Session**	

Total (Max)	**Performance (03)**	**Viva (03)**	**File (04)**	**Total (10)**
Marks Obtained				
Remarks (if any)				

Experiment evaluated by

Instructor's Name	**Engr. Bilal Iqbal**		
Date		**Signature**	

OBJECTIVE:

The objective of this lab is to introduce you to the fundamental concepts of JavaScript, such as variables, data types, and control structures. By the end of this lab, you will have a basic understanding of how to work with JavaScript in web development.

Introduction to Variables:

In JavaScript, variables are used to store data that can be used and manipulated throughout your program. JavaScript supports three types of variables:

- var (older syntax, less commonly used today)
- let (most commonly used for declaring variables that can change)
- const (used to declare variables whose values cannot be reassigned)

```
// Declaring variables using var, let, and const
var name = "John";    // A variable that can be reassigned
let age = 25;         // A variable that can be reassigned
const country = "USA"; // A constant variable (cannot be reassigned)

// Reassigning variables
name = "Alice"; // valid
age = 30;       // valid
// country = "Canada"; // Error: Assignment to constant variable.
```

- var allows you to declare a variable that can be reassigned.
- let allows for reassignment, just like var, but has a more controlled scope.
- const is used when you want to declare a variable whose value shouldn't change after initialization.

Data Types in JavaScript:

JavaScript supports several data types:

- **Primitive Data Types:**
  - String (text)
  - Number (integer or floating point)
  - Boolean (true or false)
  - Null (empty value)
  - Undefined (uninitialized value)
  - Symbol (unique and immutable value)
  - BigInt (large integers)
- **Reference Data Types:**
  - Object (collections of properties)
  - Array (ordered list of values)

```
// Primitive Data Types
let stringExample = "Hello, world!"; // String
let numberExample = 100;             // Number
let isAvailable = true;              // Boolean
let emptyValue = null;               // Null
let undefinedValue;                  // Undefined
// Reference Data Type
let person = {                       // Object
  name: "John",
```

```
  age: 30
};

let numbersArray = [1, 2, 3, 4];      // Array
```

- Strings hold text, numbers can be integers or floats, booleans are true or false, null represents no value, and undefined means a variable has not been assigned a value.
- Objects are used to store collections of properties and arrays are used to store ordered lists of values.

Control Structures:

Control structures allow you to control the flow of your program. In JavaScript, common control structures include if, else, else if, and loops (for, while).

1. **Conditional Statements:**

Conditional statements help to execute certain blocks of code based on conditions.

```
let num = 10;

if (num > 5) {
    console.log("Number is greater than 5");
} else if (num === 5) {
    console.log("Number is equal to 5");
} else {
    console.log("Number is less than 5");
}
```

- The if statement executes the code block if the condition evaluates to true.
- The else if allows you to test additional conditions.
- The else block is executed when none of the previous conditions are true.

2. **Loops:**

For Loop: Repeats a block of code a fixed number of times.

```
for (let i = 0; i < 5; i++) {
    console.log(i);
}
```

- The for loop is useful when you know beforehand how many times you want to execute a statement.

While Loop: Continues to execute a block of code if a condition is true.

```
let j = 0;
while (j < 5) {
    console.log(j);
    j++;
}
```

- The while loop is useful when you do not know how many times the loop will run but have a condition that will stop it

Lab Task:

Task 1:

1. Declare a variable username and assign a string value to it.
2. Declare a variable age and assign a number value to it.
3. Print both values to the console.

Task 2:

1. Create an if-else statement to check whether a number (stored in a variable num) is positive, negative, or zero. Print the result accordingly.

Task 3:

1. Write a for loop that prints all even numbers from 0 to 20.

Task 4:

1. Write a while loop that prints the values of x from 1 to 10, where each value of x is multiplied by 2.

Task 5:

1. Create an array called fruits with at least 5 elements. Write a for loop to print all elements of the array.