JavaScript Problem Set 3 (PS3)

Beginner Level – Intermediate Concepts

Topics Covered: Conditionals, Loops, Arrow Functions, Classes, DOM, Local Storage, Template Literals

Problem 1 Grade Calculator

Write a function `getGrade(score)` that returns a letter grade (A–F) based on the score.

Solution

```
function getGrade(score) {
  if (score >= 90) return "A";
  else if (score >= 80) return "B";
  else if (score >= 70) return "C";
  else if (score >= 60) return "D";
  else return "F";
}
console.log(getGrade(85)); // Output: "B"
```

Problem 2 Filter Even Numbers

Write a function `filterEven(nums)` that returns a new array of even numbers.

Solution

```
function filterEven(nums) {
  return nums.filter(n => n % 2 === 0);
}
console.log(filterEven([1, 2, 3, 4, 5])); // Output: [2, 4]
```

Problem 3 Matrix Sum

Write a function `sumMatrix(matrix)` that sums all numbers in a 2D array.

Solution

```
function sumMatrix(matrix) {
  let sum = 0;
  for (let row of matrix) {
    for (let val of row) {
      sum += val;
    }
  }
  return sum;
}
console.log(sumMatrix([[1, 2], [3, 4]])); // Output: 10
```

Problem 4 Find User by Name

Write a function `findUser(users, name)` that returns a matching user object.

Solution

```
function findUser(users, name) {
  return users.find(user => user.name === name);
}

let users = [
  { name: "Alice", age: 20 },
  { name: "Bob", age: 25 }
];
console.log(findUser(users, "Bob"));
```

Problem 5 Person Class

Create a `Person` class with a `greet()` method.

Solution

```
class Person {
  constructor(name, age) {
    this.name = name;
    this.age = age;
  }

  greet() {
    return `Hi, I'm ${this.name} and I'm ${this.age} years old`;
```

```
  }
}

let p = new Person("Jake", 30);
console.log(p.greet());
```

Problem 6 Count Words

Write a function `countWords(sentence)` that returns the number of words.

Solution

```
function countWords(sentence) {
  return sentence.trim().split(/\s+/).length;
}

console.log(countWords("I love learning JavaScript")); // Output: 4
```

Problem 7 Click Counter (Browser)

Display a button and increment a count on click.

HTML

```
<button id="clickBtn">Click me!</button>
<p>Count: <span id="counter">0</span></p>
```

JavaScript

```
let count = 0;

document.getElementById("clickBtn").addEventListener("click", () =>
   {
  count++;
  document.getElementById("counter").textContent = count;
});
```

Problem 8 Save Name to Local Storage

Store a name and show a message when page loads.

HTML

```
<input type="text" id="nameInput" placeholder="Enter␣your␣name">
<button id="saveBtn">Save</button>
<p id="welcome"></p>
```

JavaScript

```
let savedName = localStorage.getItem("userName");
if (savedName) {
  document.getElementById("welcome").textContent = `Welcome back, ${
     savedName}!`;
}

document.getElementById("saveBtn").addEventListener("click", () => {
  let name = document.getElementById("nameInput").value;
  localStorage.setItem("userName", name);
  document.getElementById("welcome").textContent = `Welcome, ${name
     }!`;
});
```

Problem 9 Tip Calculator

Write a function `calculateTip(amount, percent)`.

Solution

```
function calculateTip(amount, percent) {
  return amount * (percent / 100);
}

console.log(calculateTip(100, 15)); // Output: 15
```

Problem 10 Rock, Paper, Scissors

Write a function `playRPS(p1, p2)` that returns the winner.

Solution

```
function playRPS(p1, p2) {
  if (p1 === p2) return "Draw";
  if (
    (p1 === "rock" && p2 === "scissors") ||
    (p1 === "scissors" && p2 === "paper") ||
    (p1 === "paper" && p2 === "rock")
  ) {
    return "Player 1 wins";
  }
  return "Player 2 wins";
}

console.log(playRPS("rock", "scissors")); // Output: Player 1 wins
```