

Assignments on Arrays and Loops

Assignment 1: Basic Array Operations

Objective: Understand how to create and manipulate arrays.

Task:

1. Create an array of 10 integers.
2. Populate the array with numbers 1 through 10.
3. Print all the elements of the array.
4. Change the value of the fifth element to 50 and print the updated array.

Example Output:

Original Array: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]

Updated Array: [1, 2, 3, 4, 50, 6, 7, 8, 9, 10]

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Assignment 2: Summing Array Elements

Objective: Use loops to iterate over an array.

Task:

1. Create an array of 5 floating-point numbers.
2. Populate the array with any values of your choice.
3. Write a loop to calculate the sum of all elements in the array.
4. Print the sum.

Example Output:

Array: [1.2, 2.3, 3.4, 4.5, 5.6]

Sum: 17.0

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Assignment 3: Finding the Maximum Element

Objective: Use loops to find the maximum value in an array.

Task:

1. Create an array of 7 integers.
2. Populate the array with random values.
3. Write a loop to find the maximum value in the array.
4. Print the maximum value.

Example Output:

Array: [5, 3, 8, 6, 2, 7, 4]

Maximum Value: 8

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Assignment 4: Reversing an Array

Objective: Practice manipulating arrays with loops.

Task:

1. Create an array of 6 characters.
2. Populate the array with the characters of your choice.
3. Write a loop to reverse the elements of the array.
4. Print the reversed array.

Example Output:

Original Array: ['a', 'b', 'c', 'd', 'e', 'f']

Reversed Array: ['f', 'e', 'd', 'c', 'b', 'a']

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Assignment 5: Count Occurrences

Objective: Use nested loops to count occurrences of elements.

Task:

1. Create an array of 10 integers with some duplicate values.
2. Write a nested loop to count the number of occurrences of each unique element.
3. Print each unique element along with its count.

Example Output:

Array: [1, 2, 2, 3, 4, 4, 4, 5, 5, 6]

Occurrences:

1: 1 time(s)

2: 2 time(s)

3: 1 time(s)

4: 3 time(s)

5: 2 time(s)

6: 1 time(s)

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Assignment 6: Multi-dimensional Array

Objective: Understand and work with multi-dimensional arrays.

Task:

1. Create a 3x3 matrix (2D array) of integers.
2. Populate the matrix with values from 1 to 9.
3. Write a nested loop to print the matrix in a 3x3 grid format.
4. Write another nested loop to calculate the sum of the diagonal elements (top-left to bottom-right).

Example Output:

Matrix:

1 2 3

4 5 6

7 8 9

Sum of diagonal elements: 15