

Day 3

Arrays

1) Array1

```
package Day3;

public class arrr1 {

    public static void main(String[] args) {

        int[] arr = {1, 2, 3, 4, 5, 6};
        int sum = 0;
        for (int num : arr) {
            sum += num;
        }
        System.out.println("Total sum of all elements: " + sum);
    }
}
```

Output : Total sum of all elements: 21

2) Array 2

```
package Day3;

public class arrr2 {

    public static void main(String[] args) {

        int[] arr = {1, 2, 3, 4, 5, 6};
        int even = 0, odd = 0;

        for (int num : arr) {
```

```

        if (num % 2 == 0) {
            even++;
        } else {
            odd++;
        }
    }

    System.out.println("Total even elements: " + even);
    System.out.println("Total odd elements: " + odd);
}
}

```

Output : Total even elements: 3
Total odd elements: 3

3) Array 3

```

package Day3;

public class arrr3 {

    public static void main(String[] args) {

        int[] arr = {5, 2, 9, 1, 5, 12, -3};
        int min = arr[0], max = arr[0];

        for (int num : arr) {
            if (num < min) min = num;
            if (num > max) max = num;
        }

        System.out.println("Smallest number: " + min);
        System.out.println("Largest number: " + max);
    }
}

```

Output : Smallest number: -3
Largest number: 12

4) Array 4

```
package Day3;

public class arrr4 {

    public static void main(String[] args) {

        int[] arr = {5, 2, 9, 1, 5, 15, 7};
        int first = Integer.MIN_VALUE, second = Integer.MIN_VALUE;

        for (int num : arr) {
            if (num > first) {
                second = first;
                first = num;
            } else if (num > second && num != first) {
                second = num;
            }
        }

        System.out.println("The second largest number is: " + second);
    }
}
```

Output : The second largest number is: 9

5) Array 5

```
package Day3;
import java.util.Scanner;

public class arrr5 {

    public static void main(String[] args) {

        int[] arr = {1, 2, 3, 4, 5, 8, 10};
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a number to search in the array: ");
        int num = sc.nextInt();

        boolean found = false;
```

```

for (int i = 0; i < arr.length; i++) {
    if (arr[i] == num) {
        System.out.println("Number " + num + " is located at index: " + i);
        found = true;
        break;
    }
}

if (!found) {
    System.out.println("Number " + num + " was not found in the array.");
}
}
}

```

Output : Enter a number to search in the array: 8

Number 8 is located at index: 5

Enter a number to search in the array: 12

Number 12 was not found in the array.

6) Array 6

```

package Day3;

public class arrr6 {

    public static void main(String[] args) {

        int[] arr = {1, 2, 3, 4, 5, 6, 7};
        System.out.println("Array elements in reverse order:");

        for (int i = arr.length - 1; i >= 0; i--) {
            System.out.print(arr[i]);
            if (i != 0) {
                System.out.print(", ");
            }
        }
    }
}

```

Output : Array elements in reverse order:

7, 6, 5, 4, 3, 2, 1

7) Array 7

```
package Day3;
import java.util.Arrays;

public class arrr7 {

    public static void main(String[] args) {

        int[] arr = {1, 2, 3, 2, 4, 5, 1, 5, 3};
        Arrays.sort(arr);

        int j = 0;
        for (int i = 0; i < arr.length - 1; i++) {
            if (arr[i] != arr[i + 1]) {
                arr[j++] = arr[i];
            }
        }
        arr[j++] = arr[arr.length - 1];

        System.out.println("Unique elements after removing duplicates:");
        for (int i = 0; i < j; i++) {
            System.out.print(arr[i] + " ");
        }
    }
}
```

Output : Unique elements after removing duplicates:
1 2 3 4 5

8) Array 8

```
package Day3;

public class arrr8 {

    public static void main(String[] args) {

        int[] source = {10, 20, 30, 40, 50, 60};
        int[] dest = new int[source.length];
```

```

    for (int i = 0; i < source.length; i++) {
        dest[i] = source[i];
    }

    System.out.println("Elements copied into the new array:");
    for (int num : dest) {
        System.out.print(num + " ");
    }
}
}

```

Output : Elements copied into the new array:
10 20 30 40 50 60

9) Array 9

```

package Day3;

public class arrr9 {

    public static void main(String[] args) {

        int[] arr = {7, -3, 5, 2, 9, -1, 5};

        for (int i = 0; i < arr.length - 1; i++) {
            for (int j = 0; j < arr.length - i - 1; j++) {
                if (arr[j] > arr[j + 1]) {
                    int temp = arr[j];
                    arr[j] = arr[j + 1];
                    arr[j + 1] = temp;
                }
            }
        }

        System.out.println("Sorted array in ascending order:");
        for (int i = 0; i < arr.length; i++) {
            System.out.print(arr[i] + " ");
        }
    }
}

```

Output : Sorted array in ascending order:

-3 -1 2 5 5 7 9

10) Array 10

```
package Day3;

public class arrr10 {

    public static boolean isPrime(int n) {
        if (n <= 1) return false;
        for (int i = 2; i <= Math.sqrt(n); i++) {
            if (n % i == 0) return false;
        }
        return true;
    }

    public static void main(String[] args) {
        int[] arr = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13};
        System.out.println("Prime numbers with their index positions:");

        for (int i = 0; i < arr.length; i++) {
            if (isPrime(arr[i])) {
                System.out.println("Index " + i + " → " + arr[i]);
            }
        }
    }
}
```

Output : Prime numbers with their index positions:

Index 1 → 2
Index 2 → 3
Index 4 → 5
Index 6 → 7
Index 10 → 11
Index 11 → 13

11) Array 11

```
package Day3;

import java.util.LinkedHashMap;
```

```

import java.util.Map;

public class arrr11 {

    public static void main(String[] args) {

        int[] arr = {1, 2, 3, 2, 4, 1, 5};

        Map<Integer, Integer> frequencyMap = new LinkedHashMap<>();

        for (int num : arr) {
            frequencyMap.put(num, frequencyMap.getOrDefault(num, 0) + 1);
        }

        System.out.println("Element frequencies:");
        frequencyMap.forEach((key, value) ->
            System.out.println("Element " + key + " → " + value + " time(s)")
        );
    }
}

```

Output : Element frequencies:

Element 1 → 2 time(s)

Element 2 → 2 time(s)

Element 3 → 1 time(s)

Element 4 → 1 time(s)

Element 5 → 1 time(s)

12) Array 12

```

package Day3;

import java.util.Scanner;

public class Array12 {
    public static void main(String[] args) {
        int[] arr = {1, 2, 3, 4, 5};
        Scanner sc = new Scanner(System.in);

        System.out.print("Enter rotation direction (L/R): ");
        char direction = Character.toUpperCase(sc.next().charAt(0));
    }
}

```



```

System.out.print("Enter rotation count: ");
int count = sc.nextInt();

count %= arr.length;

if (direction == 'L') {
    for (int i = 0; i < count; i++) {
        int first = arr[0];
        for (int j = 0; j < arr.length - 1; j++) {
            arr[j] = arr[j + 1];
        }
        arr[arr.length - 1] = first;
    }
} else if (direction == 'R') {
    for (int i = 0; i < count; i++) {
        int last = arr[arr.length - 1];
        for (int j = arr.length - 1; j > 0; j--) {
            arr[j] = arr[j - 1];
        }
        arr[0] = last;
    }
} else {
    System.out.println("Invalid direction! Please enter L or R.");
    return;
}

System.out.println("Rotated array:");
for (int num : arr) {
    System.out.print(num + " ");
}
}

```

Output : Enter rotation direction (L/R): l
Enter rotation count: 2
Rotated array:
3 4 5 1 2

```

package Day3;

import java.util.Arrays;

public class arrr13 {

    public static void main(String[] args) {

        int[] arr1 = {1, 3, 5};
        int[] arr2 = {2, 4, 6};
        int[] merged = new int[arr1.length + arr2.length];

        for (int i = 0; i < arr1.length; i++) {
            merged[i] = arr1[i];
        }

        for (int i = 0; i < arr2.length; i++) {
            merged[arr1.length + i] = arr2[i];
        }

        for (int i = 0; i < merged.length - 1; i++) {
            boolean swapped = false;
            for (int j = 0; j < merged.length - i - 1; j++) {
                if (merged[j] > merged[j + 1]) {
                    int temp = merged[j];
                    merged[j] = merged[j + 1];
                    merged[j + 1] = temp;
                    swapped = true;
                }
            }
            if (!swapped) break;
        }

        System.out.println("Merged and Sorted Array: " + Arrays.toString(merged));
    }
}

```

Output : Merged and Sorted Array: [1, 2, 3, 4, 5, 6]

14) Array 14

```
package Day3;

public class arrr14 {

    public static void main(String[] args) {

        int[] arr = {1, 2, 3, 2, 1};
        boolean isPalindrome = true;

        for (int start = 0, end = arr.length - 1; start < end; start++, end--) {
            if (arr[start] != arr[end]) {
                isPalindrome = false;
                break;
            }
        }

        if (isPalindrome) {
            System.out.println("The array is a palindrome ");
        } else {
            System.out.println("The array is NOT a palindrome ");
        }
    }
}
```

Output : The array is a palindrome

15) Array 15

```
package Day3;

public class arrr15 {

    public static void main(String[] args) {
        int[] arr = {1, 2, 3, 4, 5, 6, 7, 8};

        System.out.println("Original array:");
        printArray(arr);

        int left = 0, right = arr.length - 1;
```

```

while (left < right) {
    while (arr[left] % 2 == 0 && left < right) {
        left++;
    }

    while (arr[right] % 2 != 0 && left < right) {
        right--;
    }

    if (left < right) {
        int temp = arr[left];
        arr[left] = arr[right];
        arr[right] = temp;
        left++;
        right--;
    }
}

System.out.println("Segregated array (Even first, Odd later):");
printArray(arr);
}

private static void printArray(int[] arr) {
    for (int num : arr) {
        System.out.print(num + " ");
    }
    System.out.println();
}
}

```

Output : Original array:

1 2 3 4 5 6 7 8

Segregated array (Even first, Odd later):

8 2 6 4 5 3 7 1

String

1) String 1

```
package Day3;

public class String1 {

    public static void main(String[] args) {
        int[] array = {1, 2, 3, 2, 1};

        System.out.print("Array: ");
        for (int num : array) {
            System.out.print(num + " ");
        }
        System.out.println();

        if (isPalindrome(array)) {
            System.out.println("The array is a palindrome.");
        } else {
            System.out.println("The array is not a palindrome.");
        }
    }

    public static boolean isPalindrome(int[] arr) {
        int start = 0;
        int end = arr.length - 1;

        while (start < end) {
            if (arr[start] != arr[end]) {
                return false;
            }
            start++;
            end--;
        }
        return true;
    }
}
```

Output:

Array: 1 2 3 2 1

The array is a palindrome.

2) String 2

```
package Day3;

public class String2 {

    public static void main(String[] args) {
        String input = "Hello World! 123 @Java";

        int[] counts = countCharacters(input);
```

```

        System.out.println("Digits: " + counts[0]);
        System.out.println("Letters: " + counts[1]);
        System.out.println("Spaces: " + counts[2]);
        System.out.println("Special Characters: " + counts[3]);
    }

    public static int[] countCharacters(String str) {
        int[] counts = new int[4];

        for (int i = 0; i < str.length(); i++) {
            char ch = str.charAt(i);

            if (Character.isDigit(ch)) {
                counts[0]++;
            } else if (Character.isLetter(ch)) {
                counts[1]++;
            } else if (Character.isWhitespace(ch)) {
                counts[2]++;
            } else {
                counts[3]++;
            }
        }

        return counts;
    }
}

```

Output:

Digits: 3

Letters: 14

Spaces: 4

Special Characters: 2

3) String 3

```

package Day3;

public class String3 {
    public static void main(String[] args) {
        String input = "Madam";

        if (isPalindrome(input)) {
            System.out.println "\"" + input + "\" is a palindrome.");
        } else {
            System.out.println "\"" + input + "\" is not a palindrome.");
        }
    }

    public static boolean isPalindrome(String str) {
        str = str.replaceAll("\\s+", "").toLowerCase();
    }
}

```

```

int start = 0;
int end = str.length() - 1;

while (start < end) {
    if (str.charAt(start) != str.charAt(end)) {
        return false;
    }
    start++;
    end--;
}
return true
}
}

```

Output:

"Madam" is a palindrome.
"Hello" is not a palindrome.

4) String 4

```

package Day3;

public class String4 {

    public static void main(String[] args) {
        String input = " Java is awesome ";

        String result = removeWhiteSpaces(input);

        System.out.println("Original String: \"" + input + "\"");
        System.out.println("String without spaces: \"" + result + "\"");
    }

    public static String removeWhiteSpaces(String str) {

        return str.replaceAll("\\s+", "");
    }
}

```

Output:

Original String: " Hi hello "
String without spaces: "Hihello"

5) String 5

```
package Day3;
import java.util.Arrays;

public class String5 {

    public static void main(String[] args) {
        String input = "programming";

        String sortedString = sortStringDescending(input);

        System.out.println("Original String: " + input);
        System.out.println("Sorted String (Descending): " + sortedString);
    }

    public static String sortStringDescending(String str) {
        char[] charArray = str.toCharArray();
        Arrays.sort(charArray); // Sort ascending first

        for (int i = 0; i < charArray.length / 2; i++) {
            char temp = charArray[i];
            charArray[i] = charArray[charArray.length - 1 - i];
            charArray[charArray.length - 1 - i] = temp;
        }
        return new String(charArray);
    }
}
```

Output:

Original String: programming

Sorted String (Descending): rrponmmigga

6) String 6

```
package Day3;

public class String6 {

    public static void main(String[] args) {
        String sentence = "Hello World! How are you?";

        String modified1 = sentence.replace(' ', '-');
        System.out.println("Original sentence: " + sentence);
        System.out.println("Modified sentence (spaces to hyphens): " + modified1);
        System.out.println("-----");

        String modified2 = sentence.replace("o", "X");
        System.out.println("Modified sentence (\\"o\\" to \\"X\\"): " + modified2);
        System.out.println("-----");
    }
}
```



```

        String modified3 = sentence.replaceFirst("o", "Y");
        System.out.println("Modified sentence (first \"o\" to \"Y\"): " + modified3);
    }
}

```

Output:

Original sentence: Hello World! How are you?

Modified sentence (spaces to hyphens): Hello-World!-How-are-you?

Modified sentence ("o" to "X"): HellX WXrld! HXw are yXu?

Modified sentence (first "o" to "Y"): Helly World! How are you?

Variables

1) Variable 1

```
package Day3;
```

```
import java.util.Scanner;
```

```
public class Variable1{
```

```
    public static void main(String[] args) {
```

```
        Scanner scanner = new Scanner(System.in);
```

```
        System.out.print("Enter the first number (num1): ");
```

```
        int num1 = scanner.nextInt();
```

```
        System.out.print("Enter the second number (num2): ");
```

```
        int num2 = scanner.nextInt();
```

```
        System.out.println("Before swapping:");
```

```
        System.out.printf("num1 = %d%n", num1);
```

```
        System.out.printf("num2 = %d%n", num2);
```

```
        int temp = num1;
```

```

num1 = num2;

num2 = temp;


System.out.println("\nAfter swapping:");
System.out.printf("num1 = %d%n", num1);
System.out.printf("num2 = %d%n", num2);


scanner.close();
}
}

```

Output:

Before swapping:

num1 = 5

num2 = 10

After swapping:

num1 = 10

num2 = 5

2) Variable 2

```

package Day3;

import java.util.Scanner;


public class Variable2{

    public static void main(String[] args) {

        Scanner scanner = new Scanner(System.in);


        System.out.print("Enter the principal amount (in $): ");
        double principal = scanner.nextDouble();


        System.out.print("Enter the annual interest rate (in %): ");
        double rate = scanner.nextDouble();
    }
}

```

```

System.out.print("Enter the time period (in years): ");

double time = scanner.nextDouble();

double interest = (principal * rate * time) / 100;


double totalAmount = principal + interest;

System.out.printf("\nSimple Interest: $%.2f%n", interest);

System.out.printf("Total Amount (Principal + Interest): $%.2f%n", totalAmount);


scanner.close();
}
}

```

Output :

```

Enter the principal amount (in $): 1000
Enter the annual interest rate (in %): 5
Enter the time period (in years): 2
Simple Interest: $100.00
Total Amount (Principal + Interest): $1100.00

```

3) Variable 3

```

package Day3;

import java.util.Scanner;


public class Variable3{

    public static double calculateArea(double length, double width) {

        return length * width;    }

    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);


        System.out.print("Enter length: ");

        double length = sc.nextDouble();

```

```

System.out.print("Enter width: ");

double width = sc.nextDouble();

double area = calculateArea(length, width);

System.out.println("The area of the rectangle is: " + area);

    sc.close();
}
}

```

Output:

Enter length: 7.5

Enter width: 4.2

The area of the rectangle is: 31.5

4) Variable 4

```

package Day4;

public class Variable4{

    public static int addNumbers(int a, int b) {

        return a + b

    }

    public static void main(String[] args) {

        int num1 = 10;

        int num2 = 20;

        int sum = addNumbers(num1, num2);

        System.out.println("The sum of " + num1 + " and " + num2 + " is: " + sum);

    }

}

```

Output :

The sum of 10 and 20 is: 30

5) Variable 5

```
package Day5;

public class Variable5{

    String name;

    int age;

    int employeeId;

    static String companyName = "Wipro";

    public Variables_Employee(int employeeId, String name, int age) {

        this.employeeId = employeeId;

        this.name = name;

        this.age = age;

    }

    public void displayEmployeeDetails() {

        System.out.println("Employee ID: " + employeeId);

        System.out.println("Employee Name: " + name);

        System.out.println("Employee Age: " + age);

        System.out.println("Company Name: " + companyName);

        System.out.println("-----");

    }

    public static void main(String[] args) {

        Variables_Employee emp1 = new Variables_Employee(101, "Harshu", 22);

        emp1.displayEmployeeDetails();

        Variables_Employee emp2 = new Variables_Employee(102, "Thejas", 21);

        emp2.displayEmployeeDetails();

    }

}
```

Output :

Employee ID: 101

Employee Name: Harshu

Employee Age: 22

Company Name: Wipro

Employee ID: 102

Employee Name: Thejas

Employee Age: 21

Company Name: Wipro