

Looping:

1. Write a Java program that uses a "for" loop to print the numbers from 1 to 10.

```
public static void main(String[] args) {  
    System.out.println(x:"The numbers from 1 to 10: ");  
    for (int i =1; i<=10; i++){ // iterates till the condition met  
        System.out.print(i+" "); // print the output  
    }  
}
```

```
The numbers from 1 to 10:  
1 2 3 4 5 6 7 8 9 10
```

2. Implement a Java program that utilizes a "while" loop to find the factorial of a given number.

```
public static void main(String[] args) {  
    Scanner sc = new Scanner(System.in);  
    System.out.println(x:"Enter a number: "); // ask the user-input  
    int num = sc.nextInt(); // store value in variable  
    int fac = 1, i=1;  
    while(i<=num){ // while loop to calculate factorial  
        fac = fac * i;  
        i++;  
    }  
    System.out.println("The factorial of "+num+" is "+fac); // print the output  
    sc.close();  
}
```

```
Enter a number:  
6  
The factorial of 6 is 720
```

3. Create a Java program using a "do-while" loop to repeatedly ask the user for input until they enter a specific value (e.g., 0).

```
public static void main(String[] args) {  
    Scanner sc = new Scanner(System.in);  
    int num;  
    do{  
        System.out.print(s:"Enter a number (press 0 to stop): "); // ask the user-input  
        num = sc.nextInt(); // store value in variable  
    }  
    while(num != 0); // stop the program when zero value is given  
    System.out.println(x:"Zero key is pressed. Your program ends");  
    sc.close();  
}
```

```
Enter a number (press 0 to stop): 2  
Enter a number (press 0 to stop): 4  
Enter a number (press 0 to stop): 6  
Enter a number (press 0 to stop): 8  
Enter a number (press 0 to stop): 0  
Zero key is pressed. Your program ends
```

4. Write a Java program that demonstrates the use of nested loops to print a pattern, such as a pyramid of stars.

```
public static void main(String[] args) {  
    int row = 5, k=0;  
    for(int i =1; i<= row; ++i, k=0){  
        for (int j =1; j<=row-i; ++j){  
            System.out.print(s:" ");  
        }  
        while( k != 2*i-1){  
            System.out.print(s:"* ");  
            ++k;  
        }  
        System.out.println();  
    }  
}
```

```
      *  
    * * *  
  * * * * *  
* * * * * * *  
* * * * * * * *
```

Arrays:

5. Develop a Java program that declares and initializes an array of integers. Print the elements of the array in reverse order.

```
public static void main(String[] args) {  
    int array[] = {2,5,8,6,7};  
    System.out.println("Input Array :" + Arrays.toString(array));  
    int n = array.length;  
    int a = 0, b = n - 1;  
    while (a < b) {  
        int temp = array[a];  
        array[a] = array[b];  
        array[b] = temp;  
        a++;  
        b--;  
    }  
    System.out.print("Reversed Array : " + Arrays.toString(array));  
}
```

```
Input Array :[2, 5, 8, 6, 7]  
Reversed Array : [7, 6, 8, 5, 2]
```

6. Implement a Java program that finds the sum and average of elements in an array of floating-point numbers.

```
public static void main(String[] args) {  
    float arr[] = {1,3,5,7,9};  
    float sum = 0;  
    float avg = 0;  
    for (float i: arr){  
        sum = sum+i;  
    }  
    avg = sum / arr.length;  
    System.out.println("The sum of elements of array: "+sum);  
    System.out.println("The average of elements of array: "+avg);  
}
```

```
The sum of elements of array: 25.0  
The average of elements of array: 5.0
```

7. Write a Java program that checks if a given element is present in an array of strings. If present, print its index; otherwise, print a message indicating its absence.

```
public static void main(String[] args) {  
    String[] arr = {"apple", "banana", "cherry", "blueberry", "strawberry"};  
    Scanner in = new Scanner(System.in);  
    System.out.println(x:"Enter a string: ");  
    String target = in.nextLine();  
    int index = Arrays.asList(arr).indexOf(target);  
    if (index != -1) {  
        System.out.println("The element " + target + " is present at index " + index + ".");  
    } else {  
        System.out.println("The element " + target + " is not present in the array.");  
    }  
    in.close();  
}
```

```
Enter a string:  
berry  
The element berry is not present in the array.
```

8. Create a Java program that sorts an array of integers in ascending order using the bubble sort algorithm.

```
public static void main(String[] args) {  
    int arr[] = {5, 12, 8, 7, 19, 1};  
    int temp = 0;  
    System.out.println(x:"Elements of original array: ");  
    for (int i = 0; i < arr.length; i++) {  
        System.out.print(" "+arr[i]);  
    }  
    for (int i = 0; i < arr.length; i++) {  
        for (int j = i+1; j < arr.length; j++) {  
            if(arr[i] > arr[j]) {  
                temp = arr[i];  
                arr[i] = arr[j];  
                arr[j] = temp;  
            }  
        }  
    }  
    System.out.println(x:"\nElements of array sorted in ascending order: ");  
    for (int i = 0; i < arr.length; i++) {  
        System.out.print(" "+arr[i]);  
    }  
}
```

```
Elements of original array:
5 12 8 7 19 1
Elements of array sorted in ascending order:
1 5 7 8 12 19
```

Enhanced For Loop:

9. Develop a Java program that uses the enhanced for loop to iterate through an array of characters and count the number of vowels.

```
public static void main(String[] args) {
    int count = 0;
    char[] arr = { 'a', 'f', 'k', 'e', 'o', 'y' };
    for (char c : arr) {
        if (c == 'a' || c == 'e' || c == 'i' || c == 'o' || c == 'u' || c == 'A' || c == 'E' || c == 'I' || c == 'O' || c == 'U') {
            count++;
        }
    }
    System.out.println("Number of vowels in the array: " + count);
}
```

```
Enter a string: riddhimaskey
Number of vowels in the string: 4
```

10. Write a Java program that uses the enhanced for loop to find the maximum value in an array of doubles.

```
public static void main(String[] args) {
    double [] arr = {7.0, 5.7, 9.8, 14.6, 7.9};
    double max = Double.MIN_VALUE;
    for (double d : arr){
        if (d > max){
            max = d;
        }
    }
    System.out.println("The maximum value in an array is "+ max);
}
```

```
The maximum value in an array is 14.6
```

11. Implement a Java program that initializes a 2D array and uses an enhanced for loop to calculate the sum of all elements.

```
public static void main(String[] args) {  
    int sum=0;  
    int [][] arr = {{1, 3, 5, 7}, {2, 4, 6, 8}};  
    for (int i[]: arr){  
        for (int j : i){  
            sum +=j;  
        }  
    }  
    System.out.println("The sum of all elements in 2D array: "+sum);  
}
```

```
The sum of all elements in 2D array: 36
```

12. Create a Java program that utilizes the enhanced for loop to concatenate all strings in an array and print the result.

```
public static void main(String[] args) {  
    String [] arr = {"Hello, ", "This ", "is ", "OOP ", "Module."};  
    String result= "";  
    for (String str : arr){  
        result += str;  
    }  
    System.out.println(result);  
}
```

```
Hello, This is OOP Module.
```