Compute time complexity for the following:

1. int[] arr = {1, 2, 3, 4, 5};  
    **for** (int num : arr) {  
    System.**out**.println(num);  
    }

O(n), n is the size of array.

1. int n = 5;  
    **for** (int i = 0; i < n; i++) {   
    **for** (int j = 0; j < n; j++) {   
    System.out.println(i + ", " + j);  
    }  
    }

O(n²), Nested loops, outside loop have n times, inside loop have n times.

1. int a = 10, b = 20;  
    int sum = a + b;  
    System.**out**.println(sum);

O(1), only need one time calculate

1. String str = "Hello";  
    StringBuilder reversed = new StringBuilder();  
    for (**int** i = str.length() - 1; i >= 0; i--) {  
    reversed.append(**str**.charAt(**i**));  
    }  
    System.out.println(**reversed**);

O(n), one for each output, don’t need to add together

1. int[] arr = {3, 7, 2, 9, 5};  
    int max = arr[0];  
     
    **for** (int i = 1; i < arr.length; i++) {  
    **if** (arr[i] > max) {  
    max = arr[i];  
    }  
    }  
   System.**out**.println("Max value: " + max);

O(n), because loop need run (n-1) times to find the max value

1. int num = 29;  
    boolean isPrime = true;  
     
    **for** (int i = 2; i <= Math.sqrt(num); i++) {  
    **if** (num % i == 0) {  
    isPrime = false;  
    **break**;  
    }  
    }  
     
    System.**out**.println(num + " is prime: " + isPrime);

O(√n), loop will run until i = √n

1. int a = 5, **b** = 10;  
     
    a = a + **b;** **b** = a - **b;** a = a - **b;**  
    System.out.println("After swap: a = " + a + ", b = " + **b);**

O(1), every time only calculate one time

1. int num = 12345;  
    int count = 0;  
     
    **while** (num > 0) {  
    num /= 10;  
    count++;  
    }  
     
    System.**out**.println("Number of digits: " + count);

O(log₁₀ n), each time num is reduced by a factor of 10, and the number of executions depends only on the number of digits in num.

1. Write a program to compute factorial of a number and compute its time complexity?
2. Write a program to generate Fibonacci series and compute its time complexity?
3. Write a program to compute mean of an array and compute its time complexity?