Exercises on loops

Exercise 1: Print numbers from 1 to 10 using a **for** loop.

for (int i = 1; i <= 10; i++) {

System.out.println(i);

}

Exercise 2: Print even numbers from 2 to 20 using a **for** loop.

for (int i = 2; i <= 20; i += 2) {

System.out.println(i);

}

Exercise 3: Calculate the sum of numbers from 1 to 100 using a **while** loop.

int sum = 0;

int i = 1;

while (i <= 100) {

sum += i;

i++;

}

System.out.println("Sum: " + sum);

Exercise 4: Calculate the factorial of a given number using a **for** loop.

int number = 5;

int factorial = 1;

for (int i = 1; i <= number; i++) {

factorial \*= i;

}

System.out.println("Factorial of " + number + " is " + factorial);

Exercise 5: Print the Fibonacci series up to a specified limit using a **while** loop.

int limit = 10;

int a = 0, b = 1;

System.out.print("Fibonacci series: " + a + " " + b + " ");

while (a + b <= limit) {

int c = a + b;

System.out.print(c + " ");

a = b;

b = c;

}

Exercise 6: Print a pattern of stars in a right-angled triangle using nested **for** loops.

int rows = 5;

for (int i = 1; i <= rows; i++) {

for (int j = 1; j <= i; j++) {

System.out.print("\* ");

}

System.out.println();

}

Exercise 7: Check if a number is prime or not using a **for** loop.

int number = 17;

boolean isPrime = true;

for (int i = 2; i <= Math.sqrt(number); i++) {

if (number % i == 0) {

isPrime = false;

break;

}

}

if (isPrime) {

System.out.println(number + " is prime.");

} else {

System.out.println(number + " is not prime.");

}

Exercise 8: Print the reverse of a given string using a **for** loop.

String input = "Hello, World!";

String reversed = "";

for (int i = input.length() - 1; i >= 0; i--) {

reversed += input.charAt(i);

}

System.out.println("Reversed: " + reversed);

Exercise 9: Calculate the sum of even numbers and the sum of odd numbers within a range using a **for** loop.

int start = 1, end = 10;

int sumEven = 0, sumOdd = 0;

for (int i = start; i <= end; i++) {

if (i % 2 == 0) {

sumEven += i;

} else {

sumOdd += i;

}

}

System.out.println("Sum of even numbers: " + sumEven);

System.out.println("Sum of odd numbers: " + sumOdd);

Exercise 10: Find the factorial of a number using a **do-while** loop.

int number = 6;

int factorial = 1;

int i = 1;

do {

factorial \*= i;

i++;

} while (i <= number);

System.out.println("Factorial of " + number + " is " + factorial);

Exercise 11: Print the first 10 terms of the geometric progression with a common ratio of 2 using a for loop.

int terms = 10;

int a = 1;

int commonRatio = 2;

for (int i = 0; i < terms; i++) {

System.out.print(a + " ");

a \*= commonRatio;

}

Exercise 12: Calculate the sum of the squares of numbers from 1 to 5 using a for-each loop.

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

int sumOfSquares = 0;

for (int num : numbers) {

sumOfSquares += num \* num;

}

System.out.println("Sum of squares: " + sumOfSquares);

Exercise 13: Print a pyramid pattern using nested for loops.

int rows = 5;

for (int i = 1; i <= rows; i++) {

for (int j = 1; j <= rows - i; j++) {

System.out.print(" ");

}

for (int k = 1; k <= 2 \* i - 1; k++) {

System.out.print("\* ");

}

System.out.println();

}

Exercise 14: Calculate the sum of all prime numbers between 1 and 50 using a for loop.

int sum = 0;

for (int number = 2; number <= 50; number++) {

boolean isPrime = true;

for (int i = 2; i <= Math.sqrt(number); i++) {

if (number % i == 0) {

isPrime = false;

break;

}

}

if (isPrime) {

sum += number;

}

}

System.out.println("Sum of prime numbers: " + sum);

Exercise 15: Print the following pattern using nested for loops:

1

12

123

1234

12345

int n = 5;

for (int i = 1; i <= n; i++) {

for (int j = 1; j <= i; j++) {

System.out.print(j);

}

System.out.println();

}

Exercise 16: Calculate the factorial of a number using a recursive function.

public static int factorial(int n) {

if (n == 0) {

return 1;

} else {

return n \* factorial(n - 1);

}

}

int number = 4;

int result = factorial(number);

System.out.println("Factorial of " + number + " is " + result);

Exercise 17: Print the reverse of a given array of integers using a for loop.

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

int[] reversedArray = new int[array.length];

for (int i = 0; i < array.length; i++) {

reversedArray[i] = array[array.length - 1 - i];

}

System.out.print("Reversed array: ");

for (int num : reversedArray) {

System.out.print(num + " ");

}

Exercise 18: Calculate the sum of digits of a given number using a while loop.

int number = 12345;

int sumOfDigits = 0;

while (number != 0) {

int digit = number % 10;

sumOfDigits += digit;

number /= 10;

}

System.out.println("Sum of digits: " + sumOfDigits);

Exercise 19: Check if a string is a palindrome (reads the same forwards and backwards) using a for loop.

String str = "racecar";

boolean isPalindrome = true;

for (int i = 0; i < str.length() / 2; i++) {

if (str.charAt(i) != str.charAt(str.length() - 1 - i)) {

isPalindrome = false;

break;

}

}

if (isPalindrome) {

System.out.println(str + " is a palindrome.");

} else {

System.out.println(str + " is not a palindrome.");

}

Exercise 20: Find the greatest common divisor (GCD) of two numbers using a while loop.

int num1 = 48, num2 = 36;

int gcd = 1;

int smaller = (num1 < num2) ? num1 : num2;

while (smaller >= 1) {

if (num1 % smaller == 0 && num2 % smaller == 0) {

gcd = smaller;

break;

}

smaller--;

}

System.out.println("GCD of " + num1 + " and " + num2 + " is " + gcd);