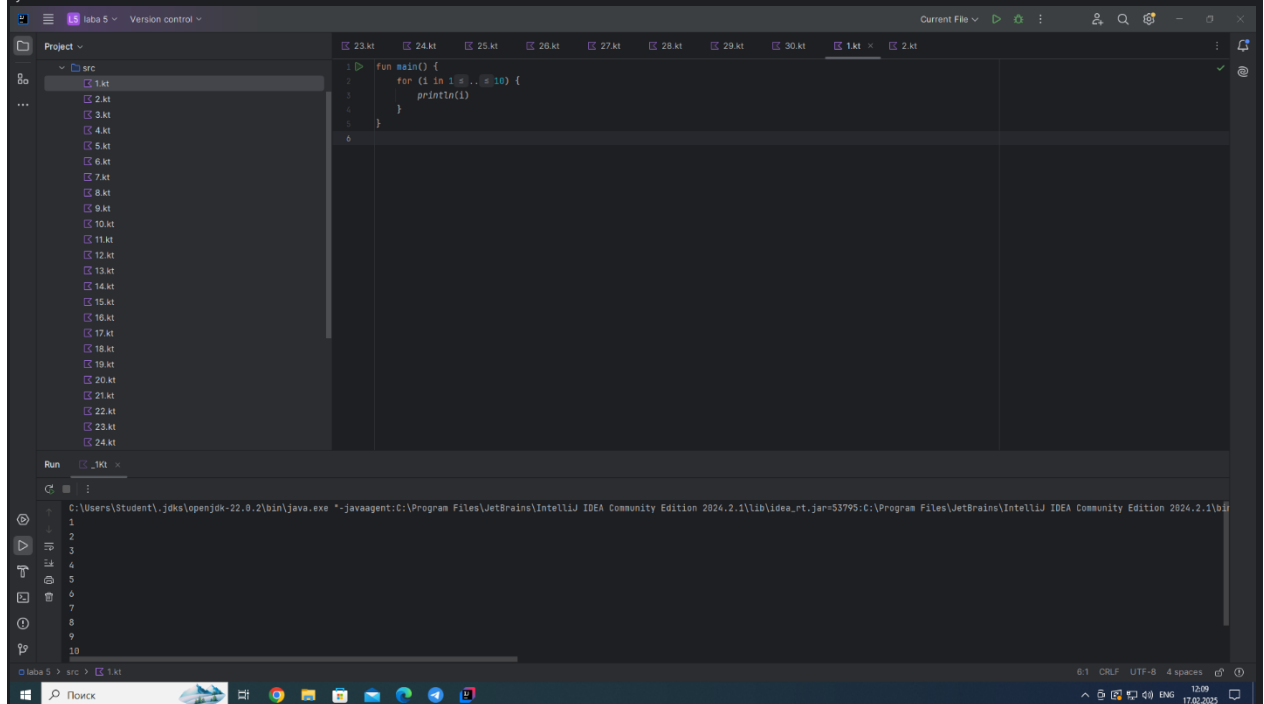


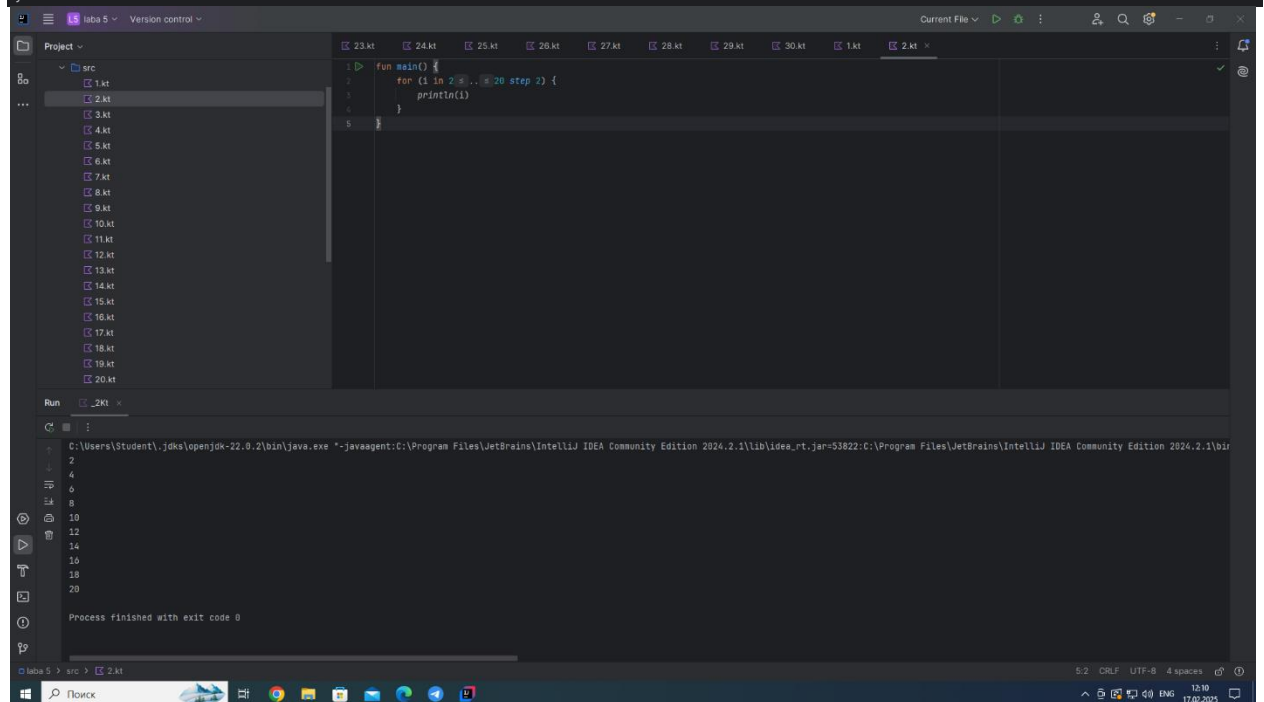
Задание 1:

```
fun main() {  
    for (i in 1..10) {  
        println(i)  
    }  
}
```



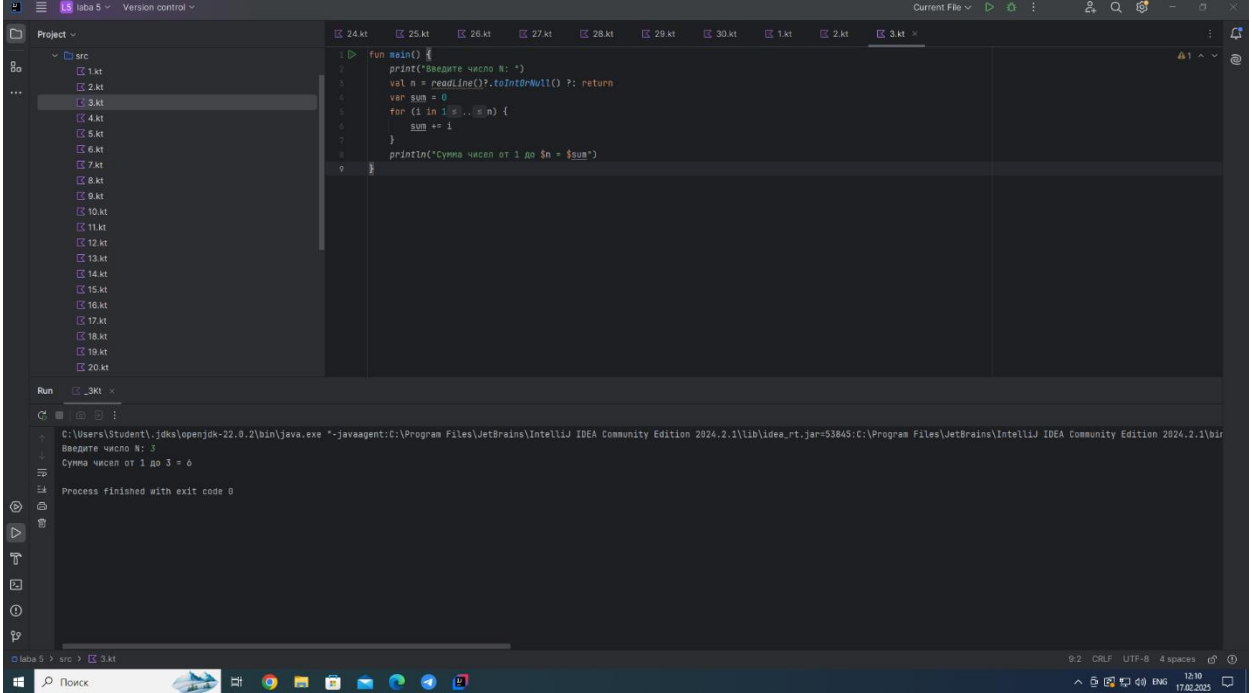
Задание 2:

```
fun main() {  
    for (i in 2..20 step 2) {  
        println(i)  
    }  
}
```



### Задание 3:

```
fun main() {
    print("Введите число N: ")
    val n = readLine()?.toIntOrNull() ?: return
    var sum = 0
    for (i in 1..n) {
        sum += i
    }
    println("Сумма чисел от 1 до $n = $sum")
}
```

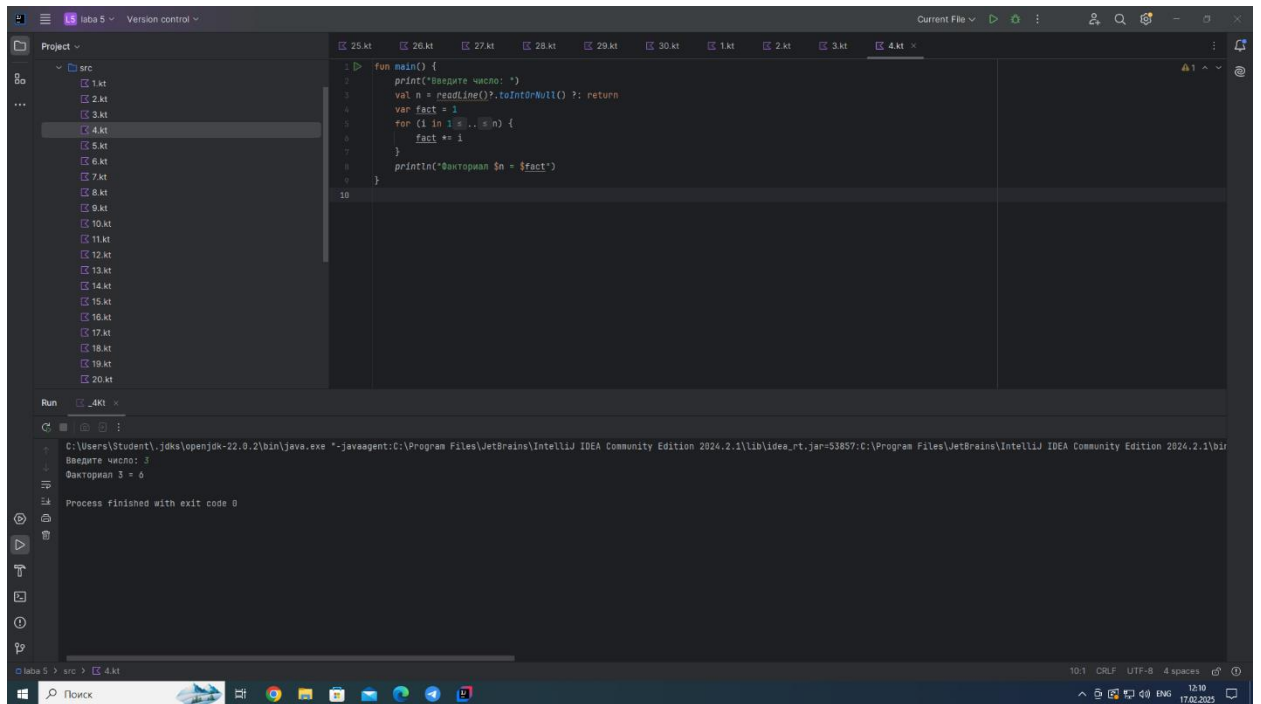


The screenshot shows the IntelliJ IDEA interface. The main editor displays the Kotlin code for Task 3. The left sidebar shows a project view with a list of files from 1.kt to 20.kt. The bottom panel shows the Run configuration and the output of the program. The output indicates that the user entered the number 3, and the program calculated the sum of numbers from 1 to 3, which is 6.

```
C:\Users\Student\jdk\openjdk-22.0.2\bin\java.exe -javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2024.2.1\lib\idea_rt.jar=53845:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2024.2.1\bin
Введите число N: 3
Сумма чисел от 1 до 3 = 6
Process finished with exit code 0
```

### Задание 4:

```
fun main() {
    print("Введите число: ")
    val n = readLine()?.toIntOrNull() ?: return
    var fact = 1
    for (i in 1..n) {
        fact *= i
    }
    println("Факториал $n = $fact")
}
```



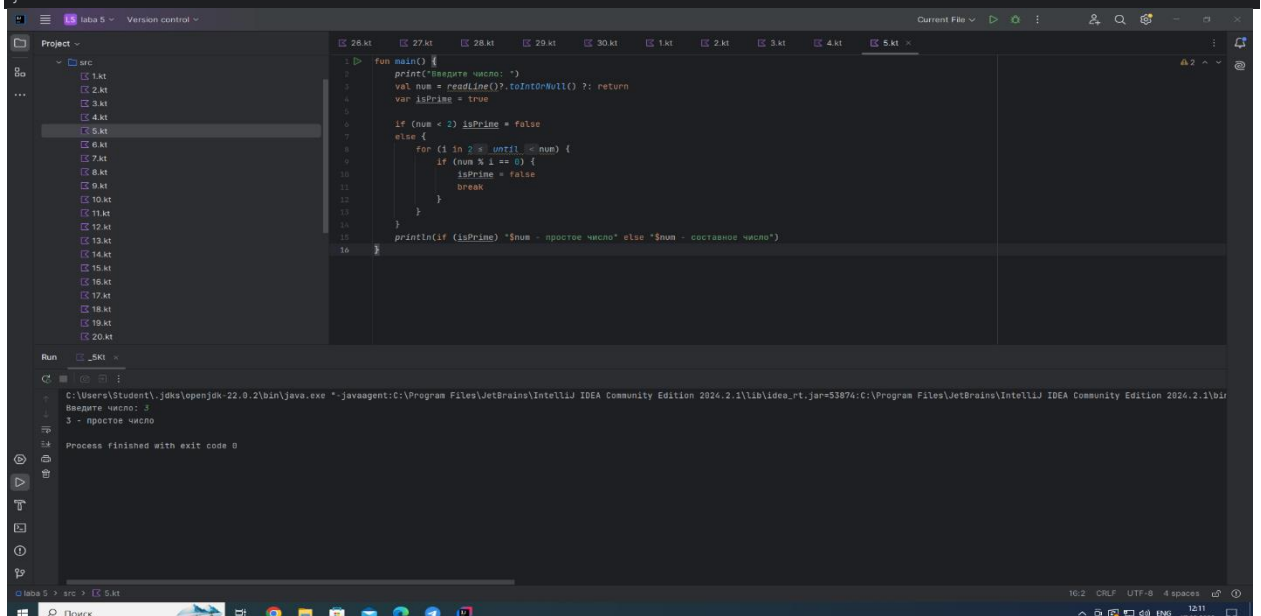
## Задание 5:

```

fun main() {
    print("Введите число: ")
    val num = readLine()?.toIntOrNull() ?: return
    var isPrime = true

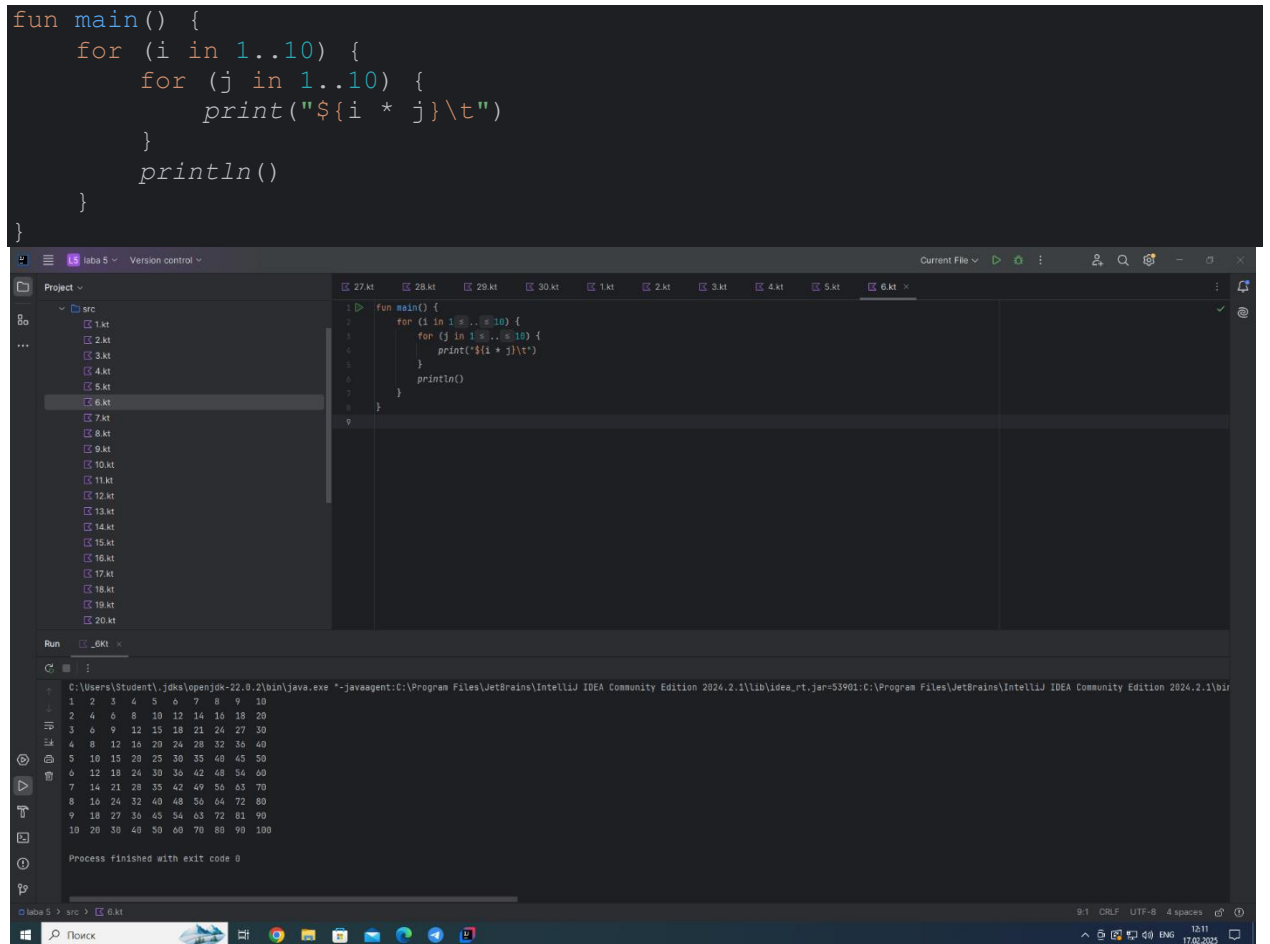
    if (num < 2) isPrime = false
    else {
        for (i in 2 until num) {
            if (num % i == 0) {
                isPrime = false
                break
            }
        }
    }
    println(if (isPrime) "$num - простое число" else "$num - составное число")
}

```



## Задание 6:

```
fun main() {
    for (i in 1..10) {
        for (j in 1..10) {
            print("${i * j}\t")
        }
        println()
    }
}
```

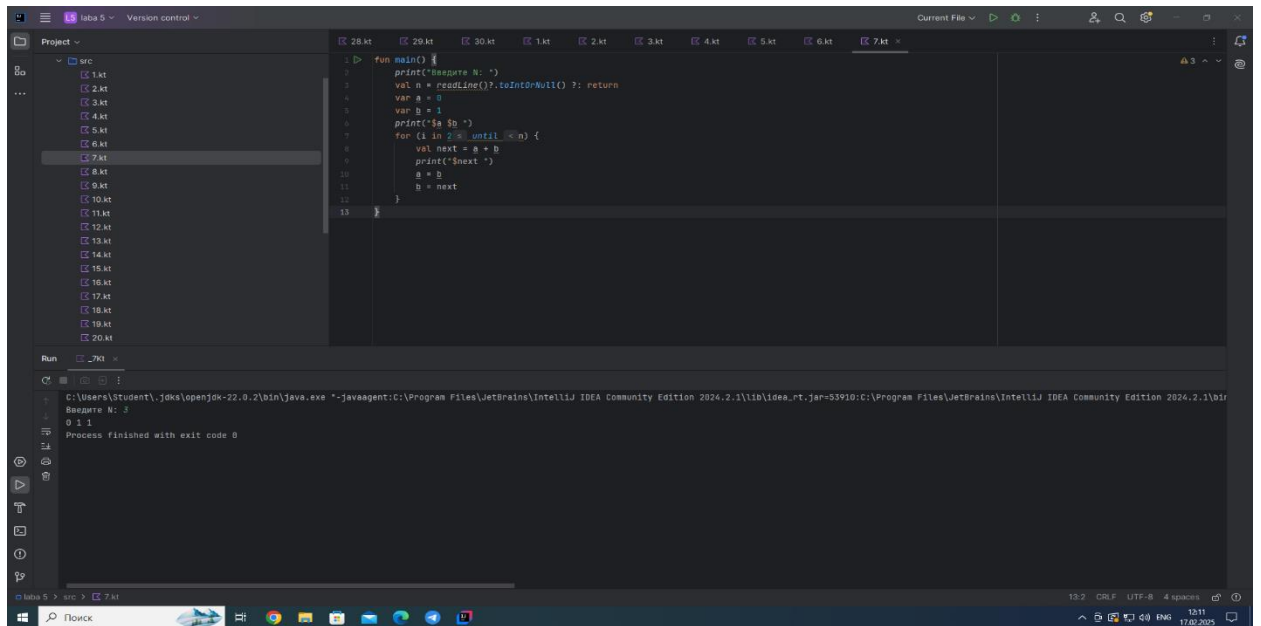


The screenshot shows the IntelliJ IDEA IDE with a Kotlin file named 6.kt. The code is a simple nested loop that prints a 10x10 multiplication table. The output in the Run console is as follows:

```
C:\Users\Student\jdk\openjdk-22.0.2\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2024.2.1\lib\idea_rt.jar=53901:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2024.2.1\bin" 1 2 3 4 5 6 7 8 9 10
2 4 6 8 10 12 14 16 18 20
3 6 9 12 15 18 21 24 27 30
4 8 12 16 20 24 28 32 36 40
5 10 15 20 25 30 35 40 45 50
6 12 18 24 30 36 42 48 54 60
7 14 21 28 35 42 49 56 63 70
8 16 24 32 40 48 56 64 72 80
9 18 27 36 45 54 63 72 81 90
10 20 30 40 50 60 70 80 90 100
Process finished with exit code 0
```

## Задание 7:

```
fun main() {
    print("Введите N: ")
    val n = readLine()?.toIntOrNull() ?: return
    var a = 0
    var b = 1
    print("$a $b ")
    for (i in 2 until n) {
        val next = a + b
        print("$next ")
        a = b
        b = next
    }
}
```

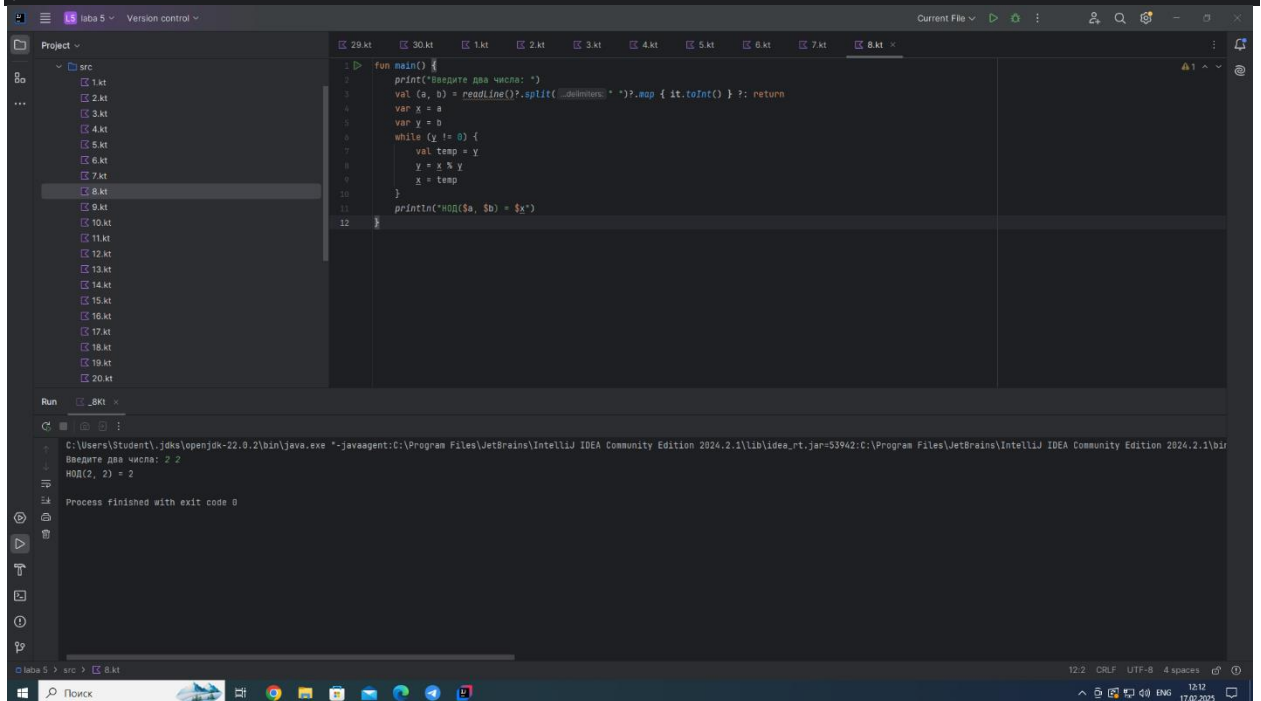


## Задание 8:

```

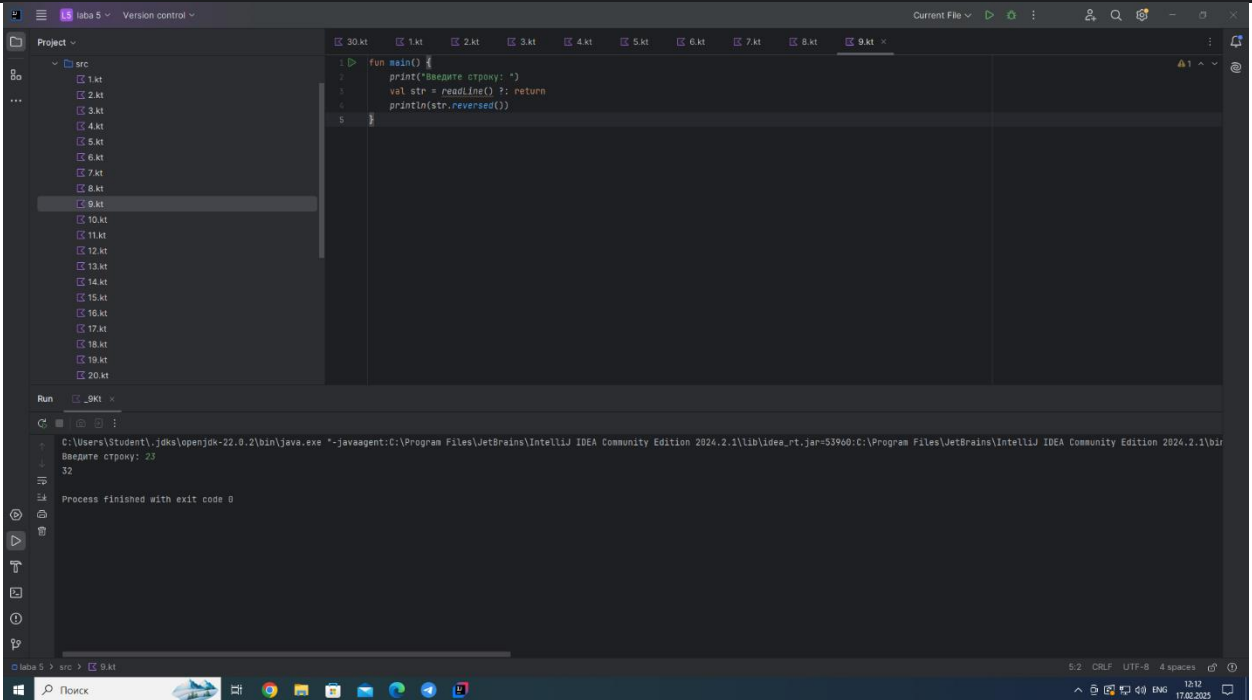
fun main() {
    print("Введите два числа: ")
    val (a, b) = readLine()?.split(" ")?.map { it.toInt() } ?: return
    var x = a
    var y = b
    while (y != 0) {
        val temp = y
        y = x % y
        x = temp
    }
    println("НОД($a, $b) = $x")
}

```



## Задание 9:

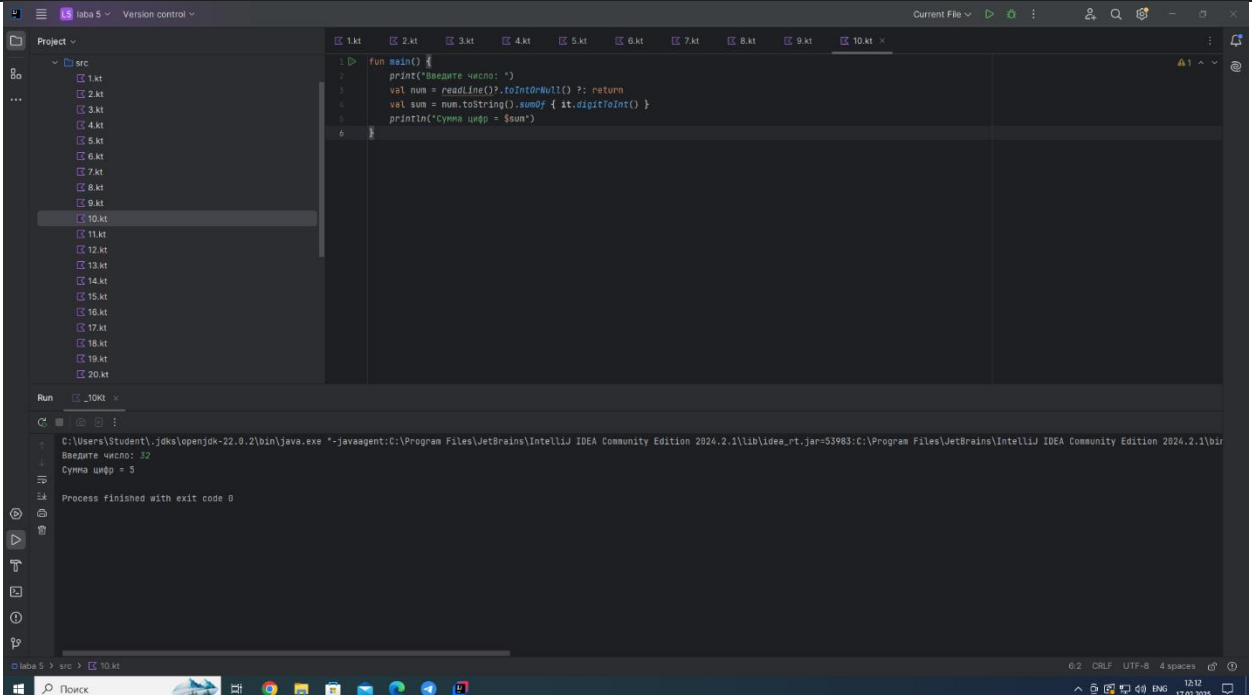
```
fun main() {
    print("Введите строку: ")
    val str = readLine() ?: return
    println(str.reversed())
}
```



The screenshot shows the IntelliJ IDEA interface. The left sidebar displays a project structure with a 'src' directory containing files from 1.kt to 20.kt. The main editor shows the code for 9.kt. The Run window at the bottom shows the command: `C:\Users\Student\jdk\openjdk-22.0.2\bin\java.exe -javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2024.2.1\lib\idea_rt.jar=53960:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2024.2.1\bin`. The output is: `Введите строку: 23` followed by `32`. The process finished with exit code 0.

## Задание 10:

```
fun main() {
    print("Введите число: ")
    val num = readLine()?.toIntOrNull() ?: return
    val sum = num.toString().sumOf { it.digitToInt() }
    println("Сумма цифр = $sum")
}
```

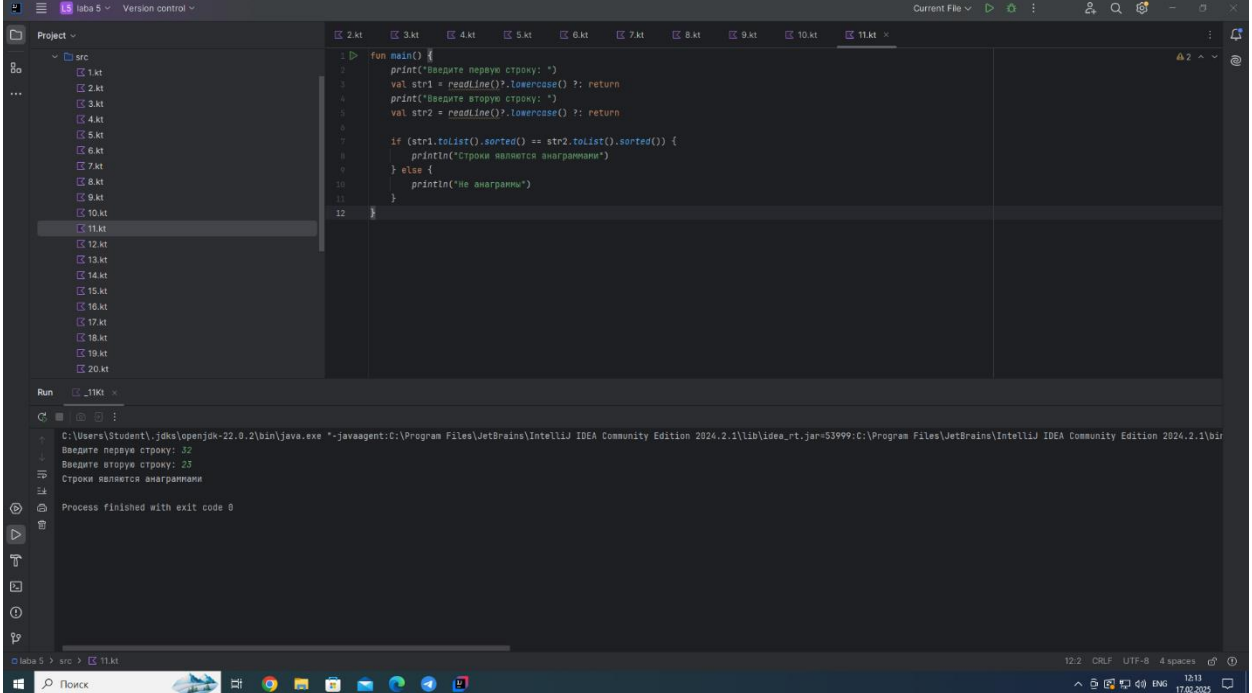


The screenshot shows the IntelliJ IDEA interface. The left sidebar displays a project structure with a 'src' directory containing files from 1.kt to 20.kt. The main editor shows the code for 10.kt. The Run window at the bottom shows the command: `C:\Users\Student\jdk\openjdk-22.0.2\bin\java.exe -javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2024.2.1\lib\idea_rt.jar=53963:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2024.2.1\bin`. The output is: `Введите число: 32` followed by `Сумма цифр = 5`. The process finished with exit code 0.

## Задание 11:

```
fun main() {
    print("Введите первую строку: ")
    val str1 = readLine()?.lowercase() ?: return
    print("Введите вторую строку: ")
    val str2 = readLine()?.lowercase() ?: return

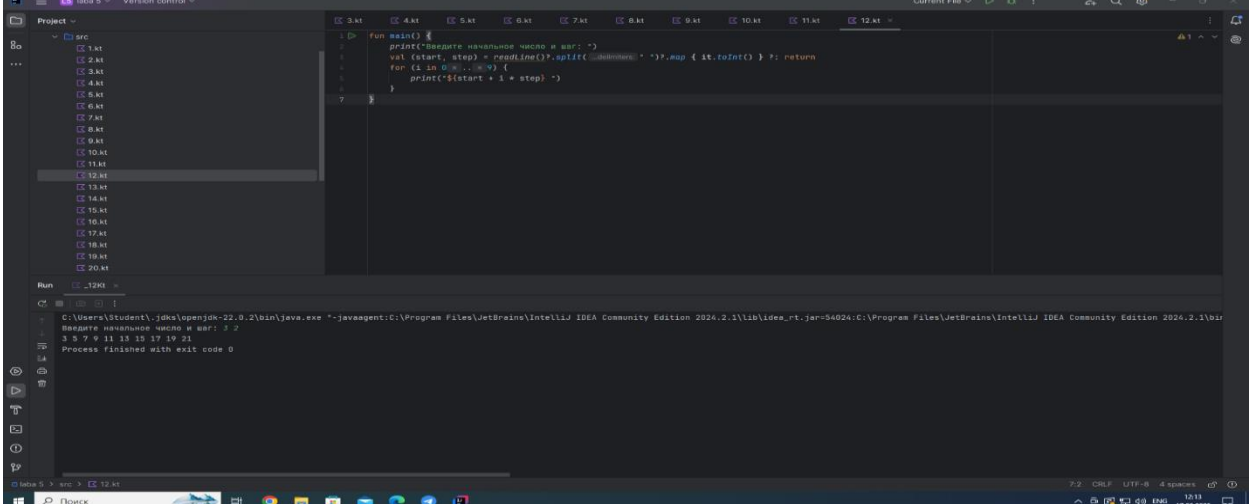
    if (str1.toList().sorted() == str2.toList().sorted()) {
        println("Строки являются анаграммами")
    } else {
        println("Не анаграммы")
    }
}
```



The screenshot shows the IntelliJ IDEA interface. The code editor displays the Kotlin code for Task 11. The left sidebar shows the project structure with files 1.kt through 20.kt. The bottom panel shows the Run output, which includes the command used to run the program and the output messages: "Введите первую строку: 32", "Введите вторую строку: 23", and "Строки являются анаграммами". The status bar at the bottom indicates the file is 11.kt, 12 lines, 111 characters, with 4 spaces and UTF-8 encoding.

## Задание 12:

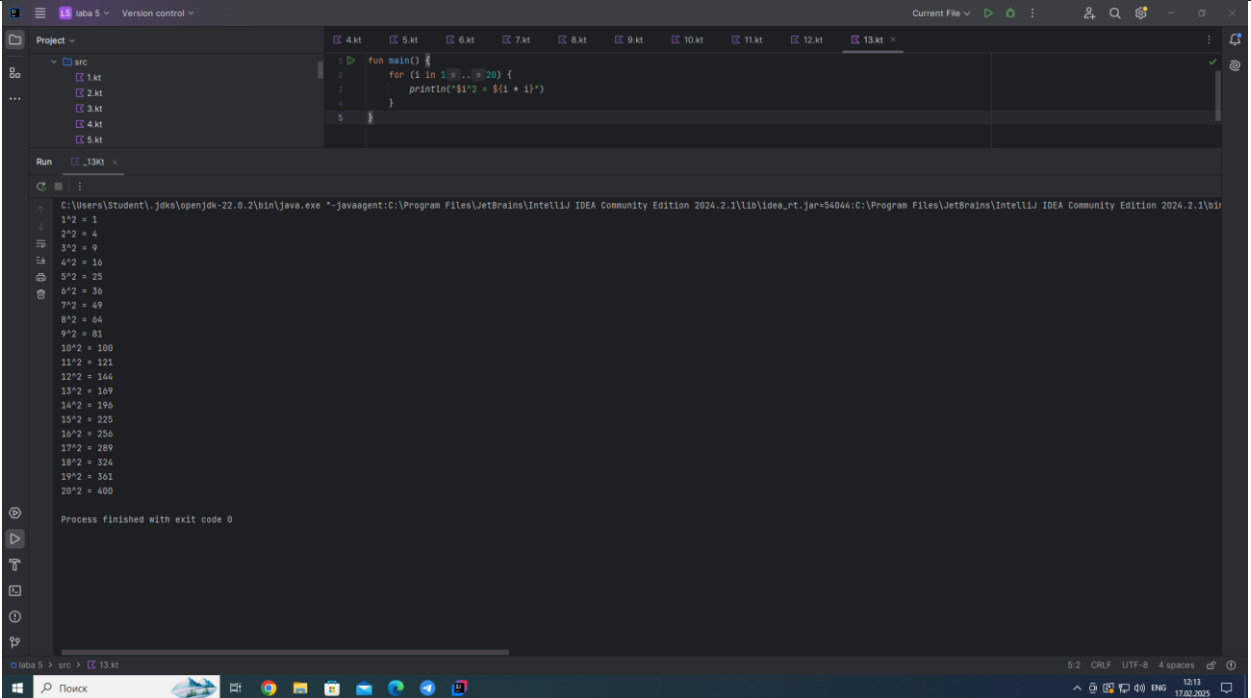
```
fun main() {
    print("Введите начальное число и шаг: ")
    val (start, step) = readLine()?.split(" ")?.map { it.toInt() } ?: return
    for (i in 0..9) {
        print("${start + i * step} ")
    }
}
```



The screenshot shows the IntelliJ IDEA interface. The code editor displays the Kotlin code for Task 12. The left sidebar shows the project structure with files 1.kt through 20.kt. The bottom panel shows the Run output, which includes the command used to run the program and the output messages: "Введите начальное число и шаг: 3 2", "3 5 7 9 11 13 15 17 19 21", and "Process finished with exit code 0". The status bar at the bottom indicates the file is 12.kt, 7 lines, 124 characters, with 4 spaces and UTF-8 encoding.

### Задание 13:

```
fun main() {
    for (i in 1..20) {
        println("$i^2 = ${i * i}")
    }
}
```

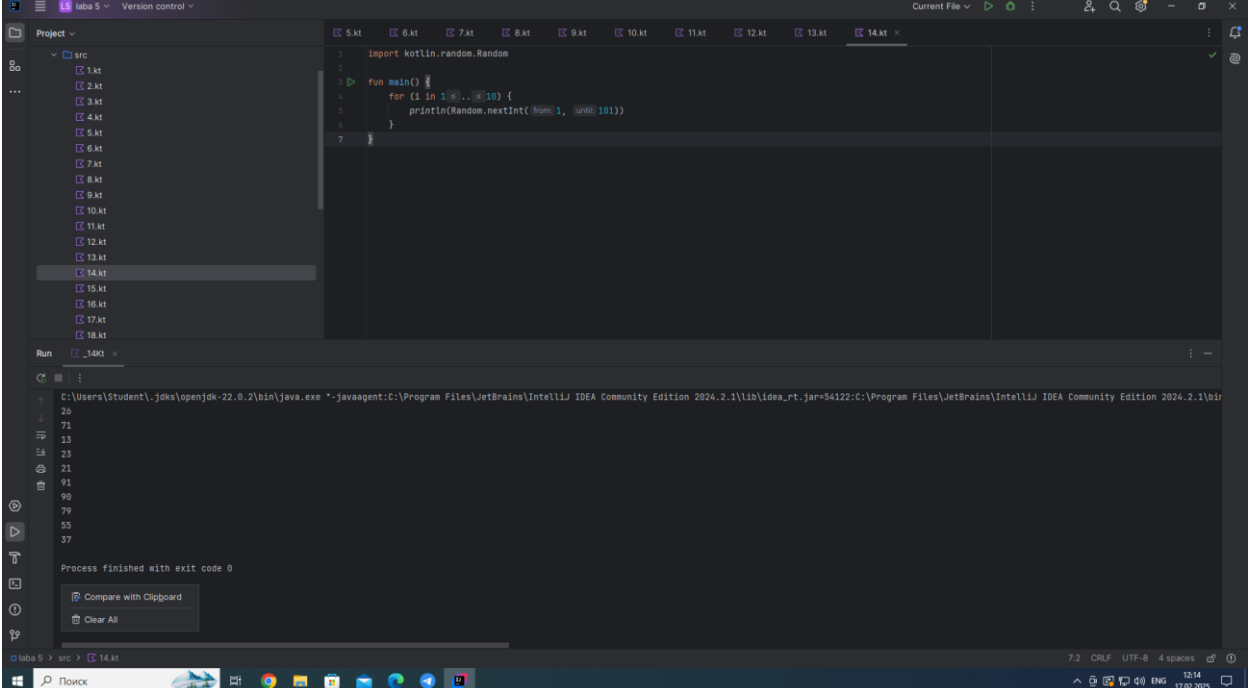


The screenshot shows the IntelliJ IDEA interface. The top editor displays a Kotlin function `main` with a `for` loop from 1 to 20, printing `$i^2 = ${i * i}`. The Run console at the bottom shows the output of the program, listing squares from 1 to 20. The process finished with exit code 0.

### Задание 14:

```
import kotlin.random.Random

fun main() {
    for (i in 1..10) {
        println(Random.nextInt(1, 101))
    }
}
```

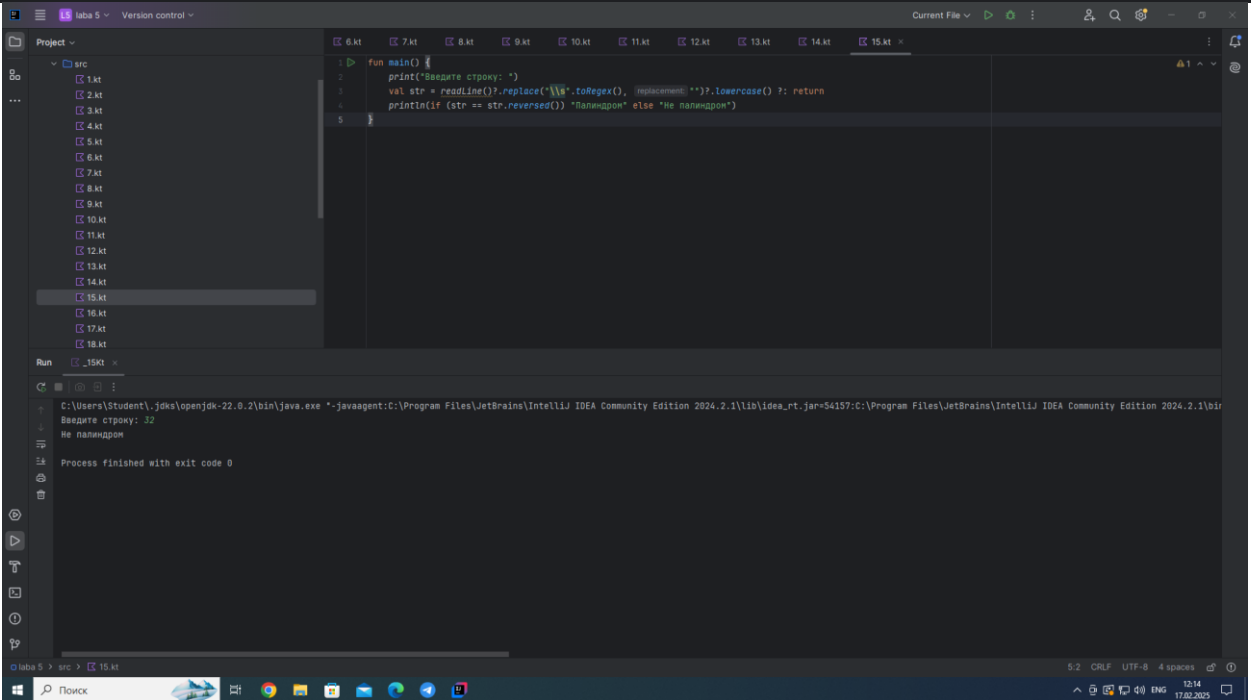


The screenshot shows the IntelliJ IDEA interface. The top editor displays a Kotlin function `main` with a `for` loop from 1 to 10, printing `Random.nextInt(1, 101)`. The Run console at the bottom shows the output of the program, listing 10 random integers. The process finished with exit code 0.



## Задание 15:

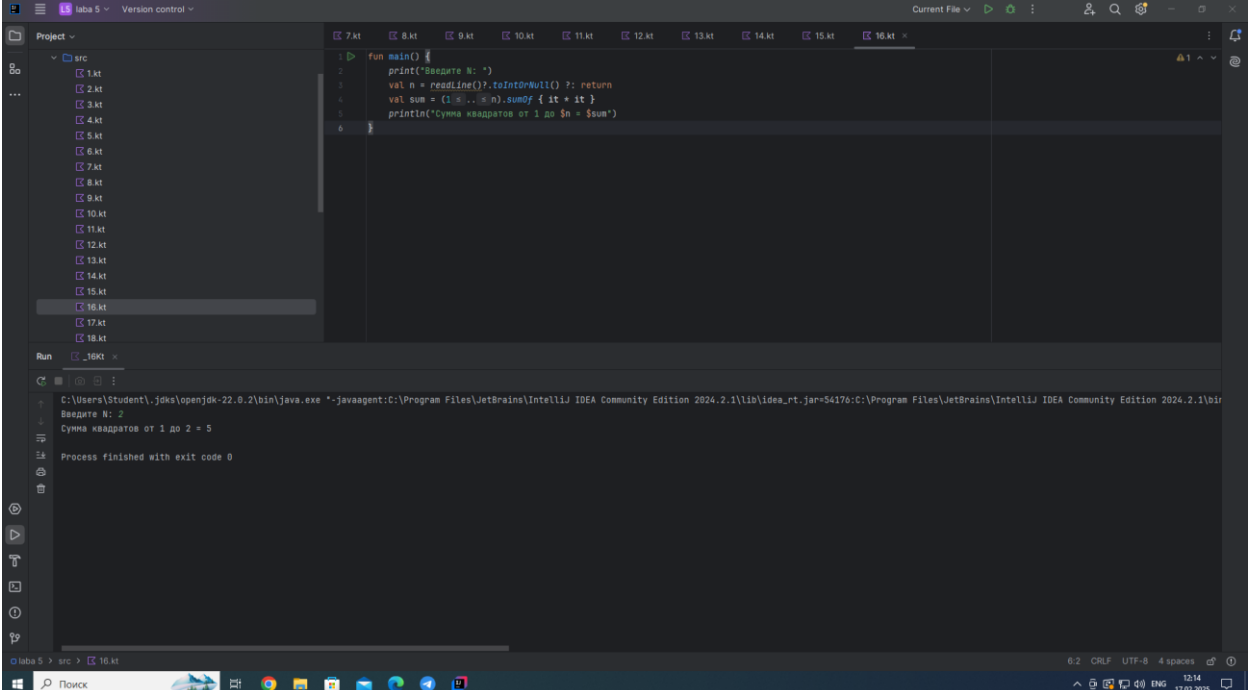
```
fun main() {
    print("Введите строку: ")
    val str = readLine()?.replace("\\s".toRegex(), "")?.lowercase() ?: return
    println(if (str == str.reversed()) "Палиндром" else "Не палиндром")
}
```



The screenshot shows the IntelliJ IDEA interface. The code editor displays a Kotlin function `main` that prompts the user to enter a string, removes spaces using `replace("\\s".toRegex(), "")`, and checks if the resulting string is a palindrome using `str == str.reversed()`. The Run window shows the execution output: "Введите строку: 32" and "Не палиндром".

## Задание 16:

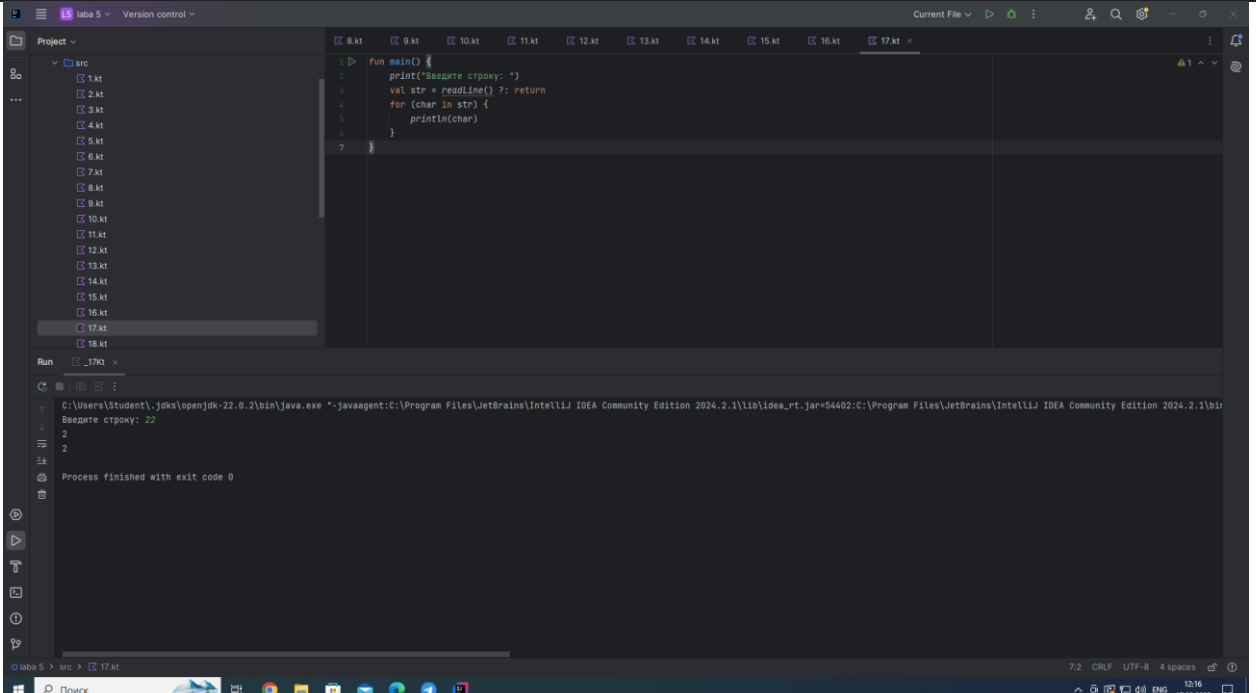
```
fun main() {
    print("Введите N: ")
    val n = readLine()?.toIntOrNull() ?: return
    val sum = (1..n).sumOf { it * it }
    println("Сумма квадратов от 1 до $n = $sum")
}
```



The screenshot shows the IntelliJ IDEA interface. The code editor displays a Kotlin function `main` that prompts the user to enter a number `N`, converts it to an integer using `toIntOrNull()`, and calculates the sum of squares from 1 to `N` using `(1..n).sumOf { it * it }`. The Run window shows the execution output: "Введите N: 2" and "Сумма квадратов от 1 до 2 = 5".

## Задание 17:

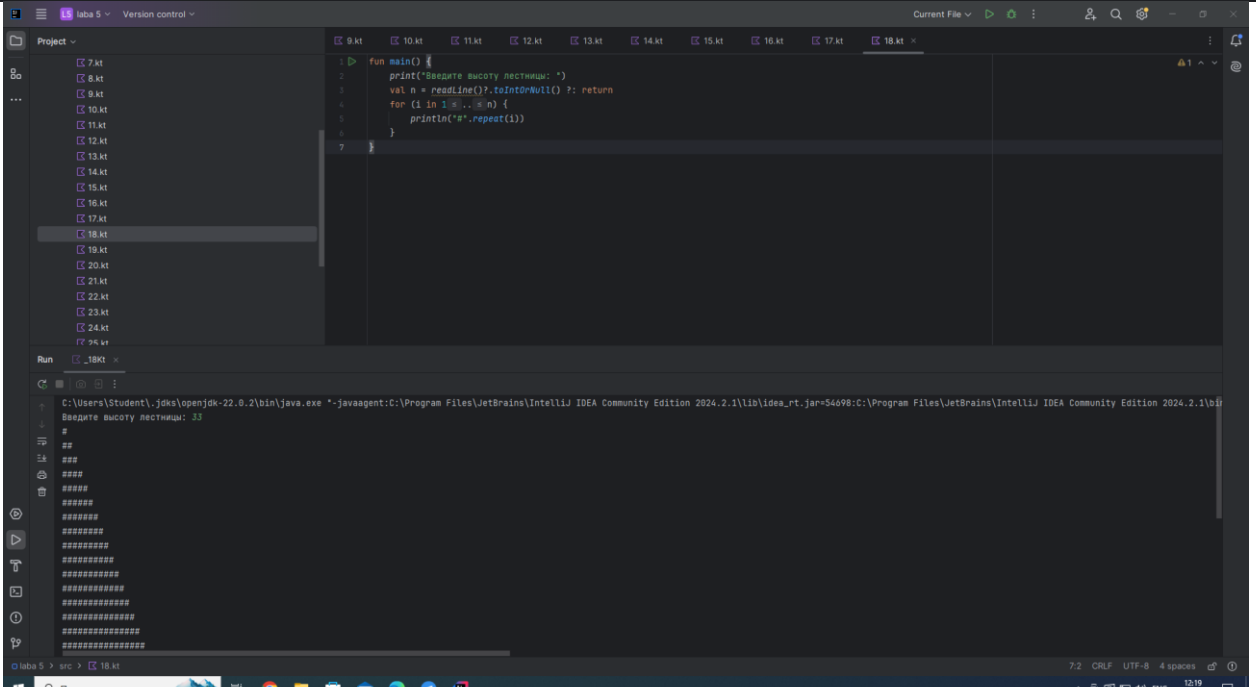
```
fun main() {
    print("Введите строку: ")
    val str = readLine() ?: return
    for (char in str) {
        println(char)
    }
}
```



The screenshot shows the IntelliJ IDEA interface. The top editor displays the Kotlin code for Task 17. The left sidebar shows the project structure with a file named 17.kt selected. The bottom Run console shows the execution of the program. The command executed is `C:\Users\Student\jdk\openjdk-22.0.2\bin\java.exe -javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2024.2.1\lib\idea_rt.jar=S4602:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2024.2.1\bin`. The output is `Введите строку: 22` followed by two lines of `2`. The process finished with exit code 0.

## Задание 18:

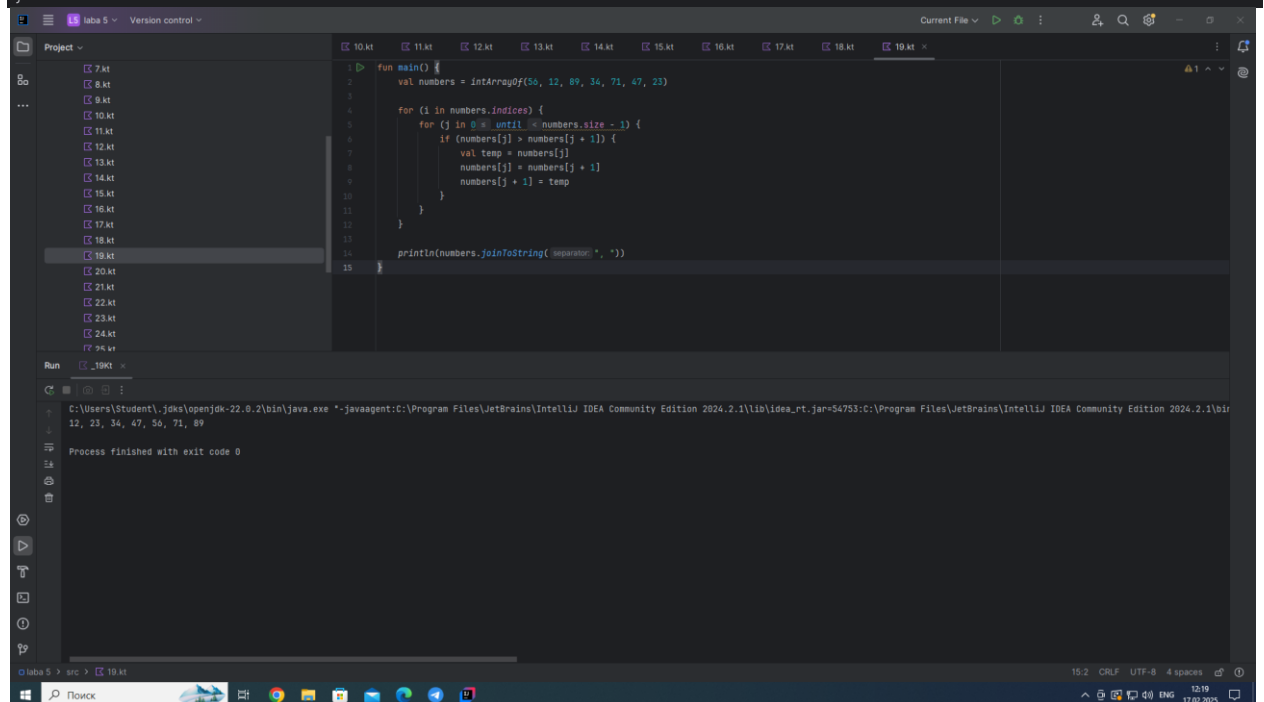
```
fun main() {
    print("Введите высоту лестницы: ")
    val n = readLine()?.toIntOrNull() ?: return
    for (i in 1..n) {
        println("#".repeat(i))
    }
}
```



The screenshot shows the IntelliJ IDEA interface. The top editor displays the Kotlin code for Task 18. The left sidebar shows the project structure with a file named 18.kt selected. The bottom Run console shows the execution of the program. The command executed is `C:\Users\Student\jdk\openjdk-22.0.2\bin\java.exe -javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2024.2.1\lib\idea_rt.jar=S4698:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2024.2.1\bin`. The output is `Введите высоту лестницы: 33` followed by a staircase pattern of '#' characters. The first line has 1 '#' and the last line has 33 '#' characters. The process finished with exit code 0.

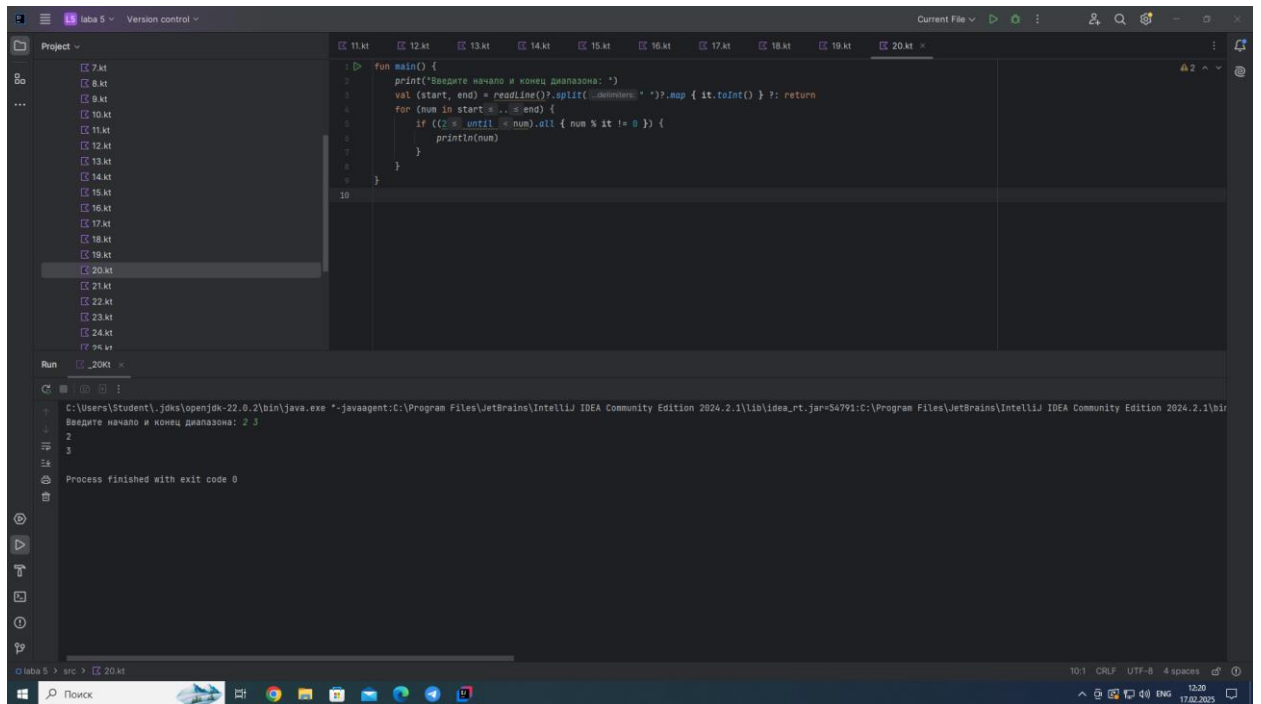
### Задание 19:

```
fun main() {  
    val numbers = intArrayOf(56, 12, 89, 34, 71, 47, 23)  
  
    for (i in numbers.indices) {  
        for (j in 0 until numbers.size - 1) {  
            if (numbers[j] > numbers[j + 1]) {  
                val temp = numbers[j]  
                numbers[j] = numbers[j + 1]  
                numbers[j + 1] = temp  
            }  
        }  
    }  
  
    println(numbers.joinToString(", "))  
}
```

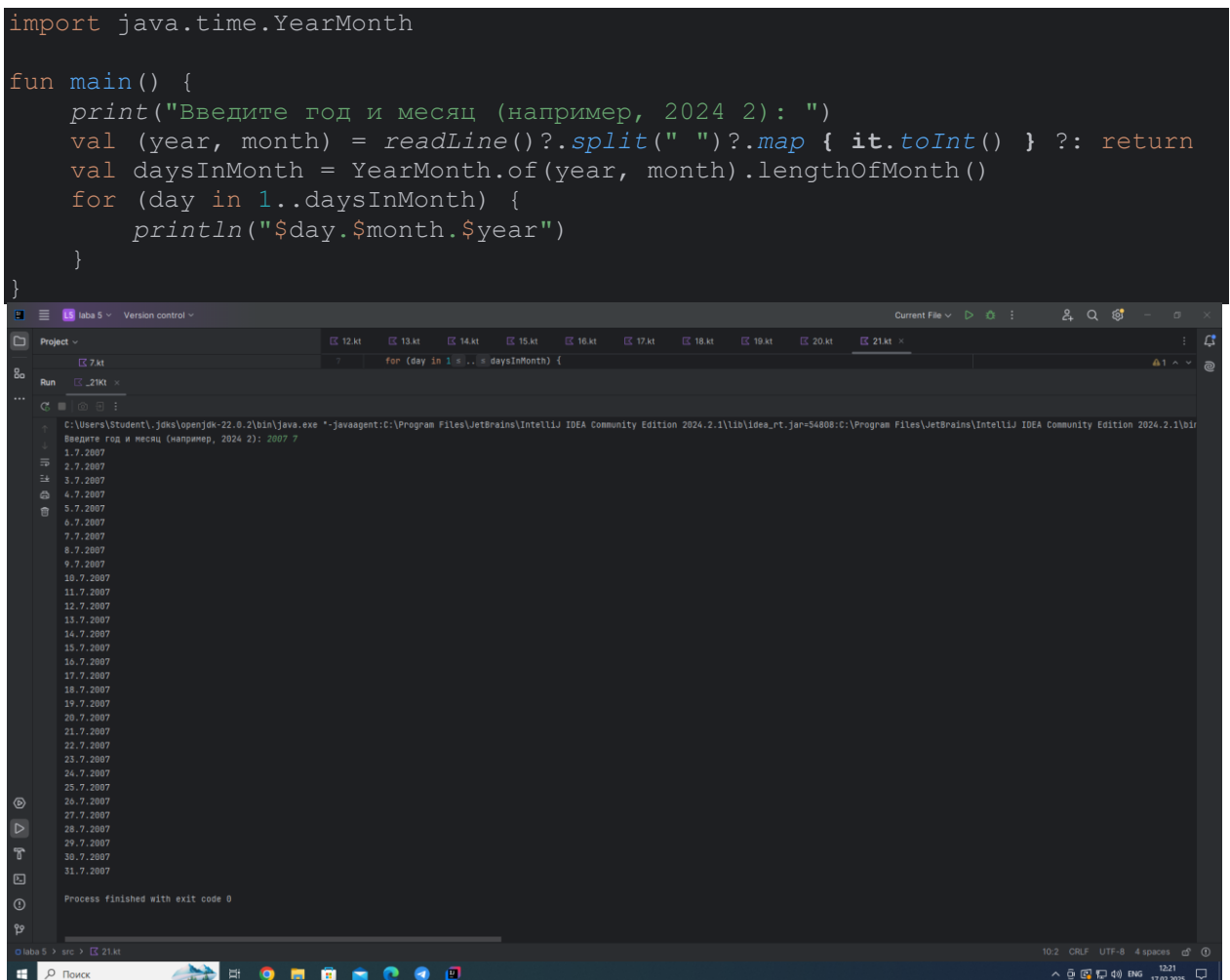


### Задание 20:

```
fun main() {  
    print("Введите начало и конец диапазона: ")  
    val (start, end) = readLine()?.split(" ")?.map { it.toInt() } ?: return  
    for (num in start..end) {  
        if ((2 until num).all { num % it != 0 }) {  
            println(num)  
        }  
    }  
}
```



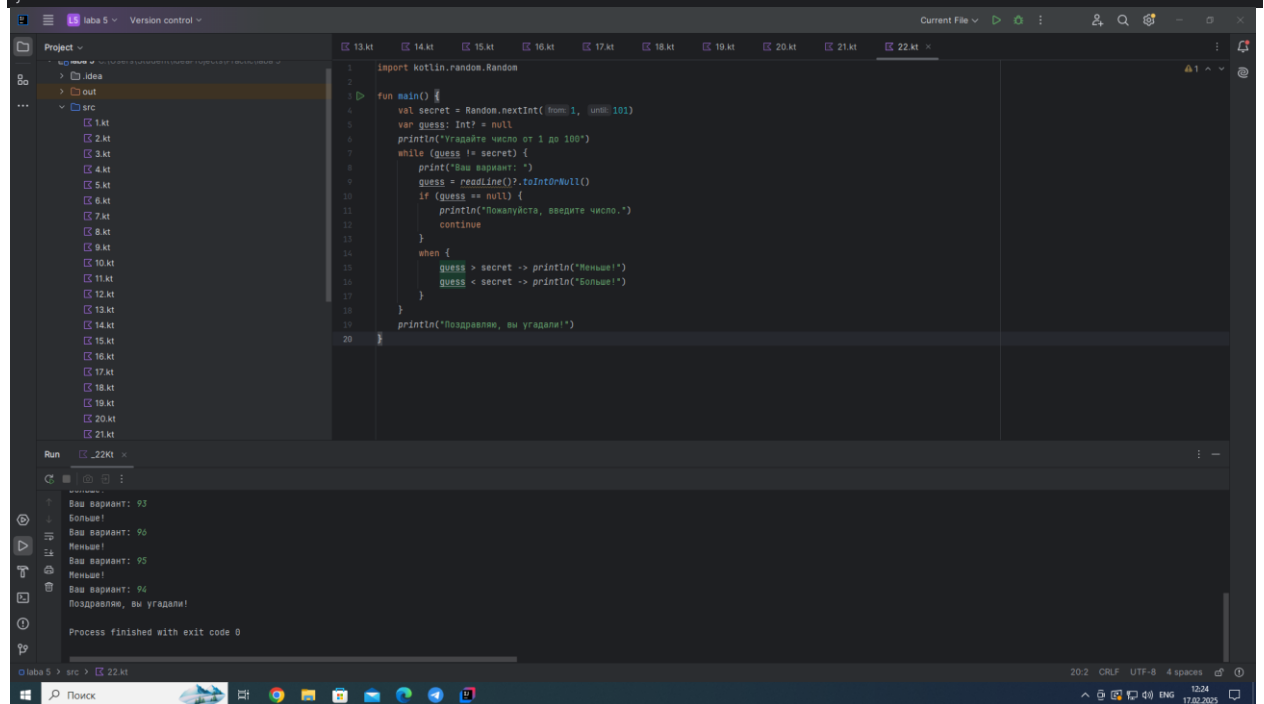
## Задание 21:



## Задание 22:

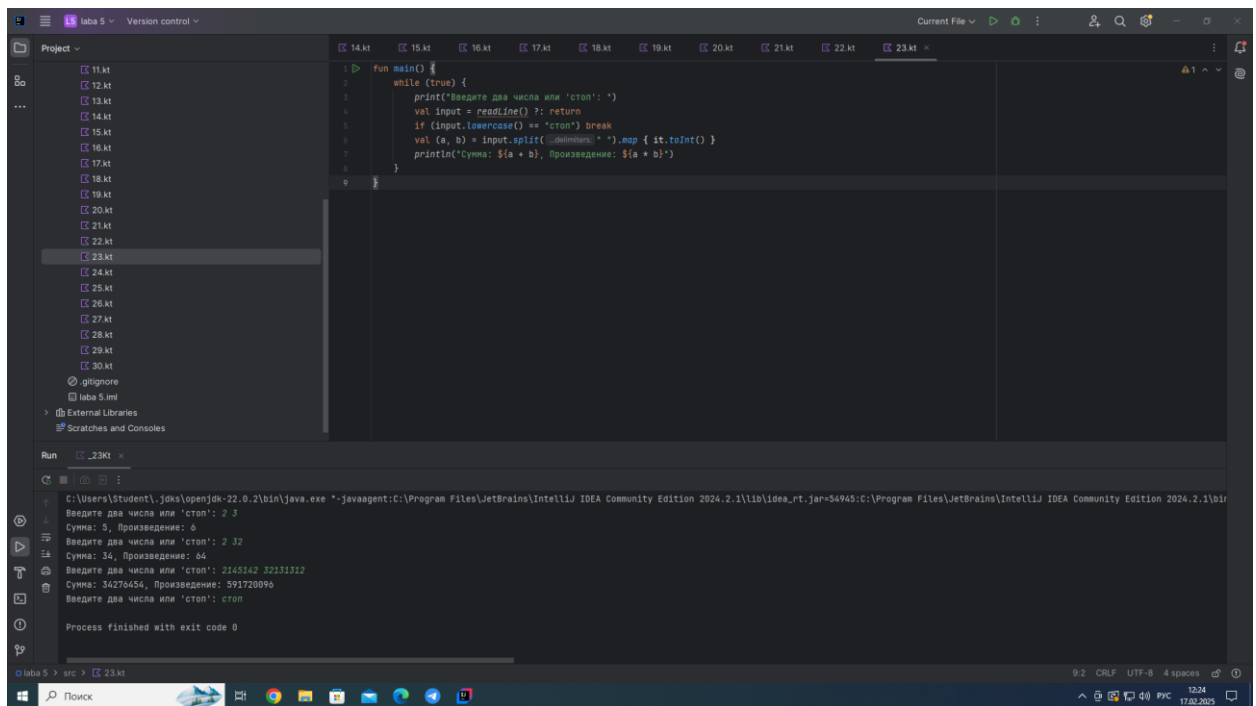
```
import kotlin.random.Random

fun main() {
    val secret = Random.nextInt(1, 101)
    var guess: Int? = null
    println("Угадайте число от 1 до 100")
    while (guess != secret) {
        print("Ваш вариант: ")
        guess = readLine()?.toIntOrNull()
        if (guess == null) {
            println("Пожалуйста, введите число.")
            continue
        }
        when {
            guess > secret -> println("Меньше!")
            guess < secret -> println("Больше!")
        }
    }
    println("Поздравляю, вы угадали!")
}
```



## Задание 23:

```
fun main() {
    while (true) {
        print("Введите два числа или 'стоп': ")
        val input = readLine() ?: return
        if (input.lowercase() == "стоп") break
        val (a, b) = input.split(" ").map { it.toInt() }
        println("Сумма: ${a + b}, Произведение: ${a * b}")
    }
}
```

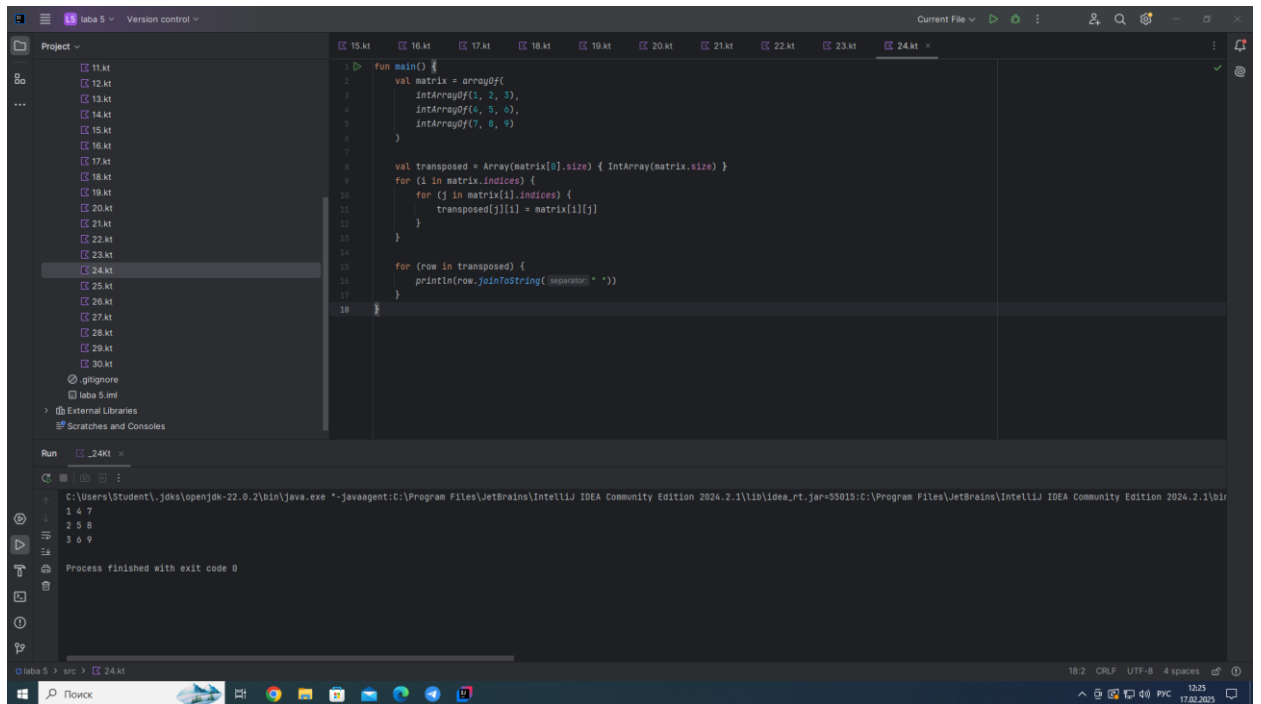


## Задание 24:

```
fun main() {
    val matrix = arrayOf(
        intArrayOf(1, 2, 3),
        intArrayOf(4, 5, 6),
        intArrayOf(7, 8, 9)
    )

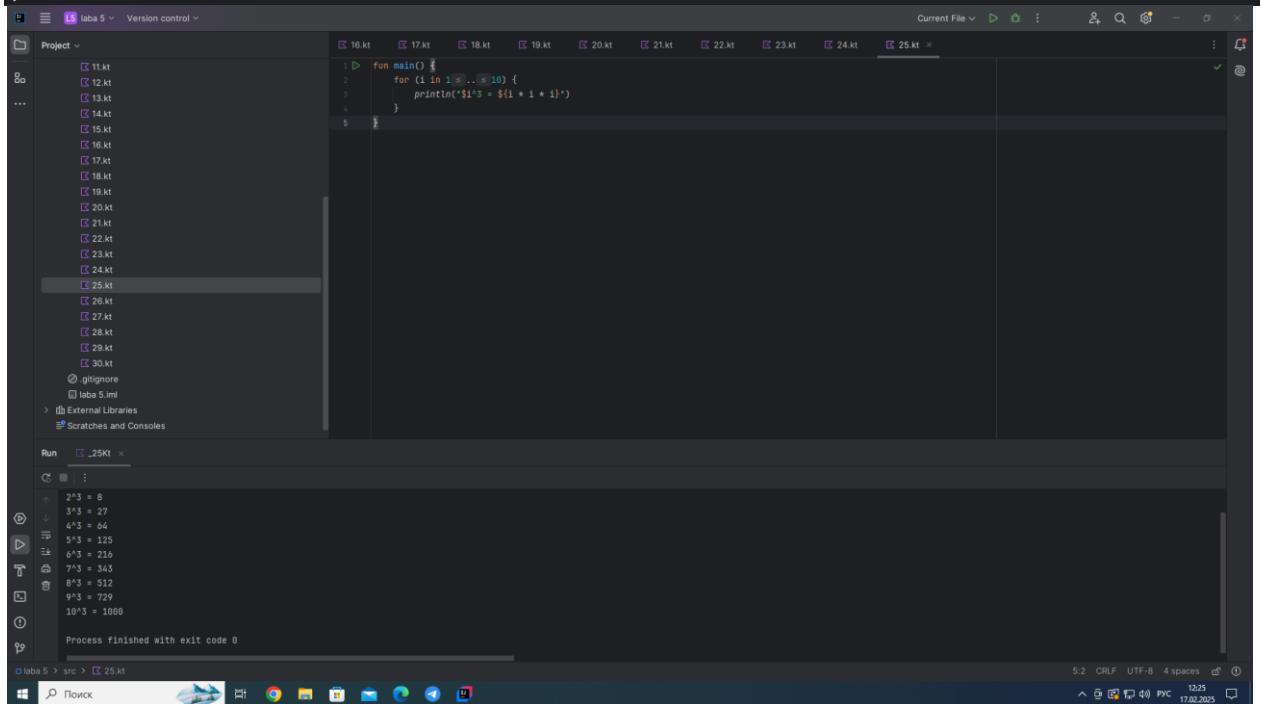
    val transposed = Array(matrix[0].size) { IntArray(matrix.size) }
    for (i in matrix.indices) {
        for (j in matrix[i].indices) {
            transposed[j][i] = matrix[i][j]
        }
    }

    for (row in transposed) {
        println(row.joinToString(" "))
    }
}
```



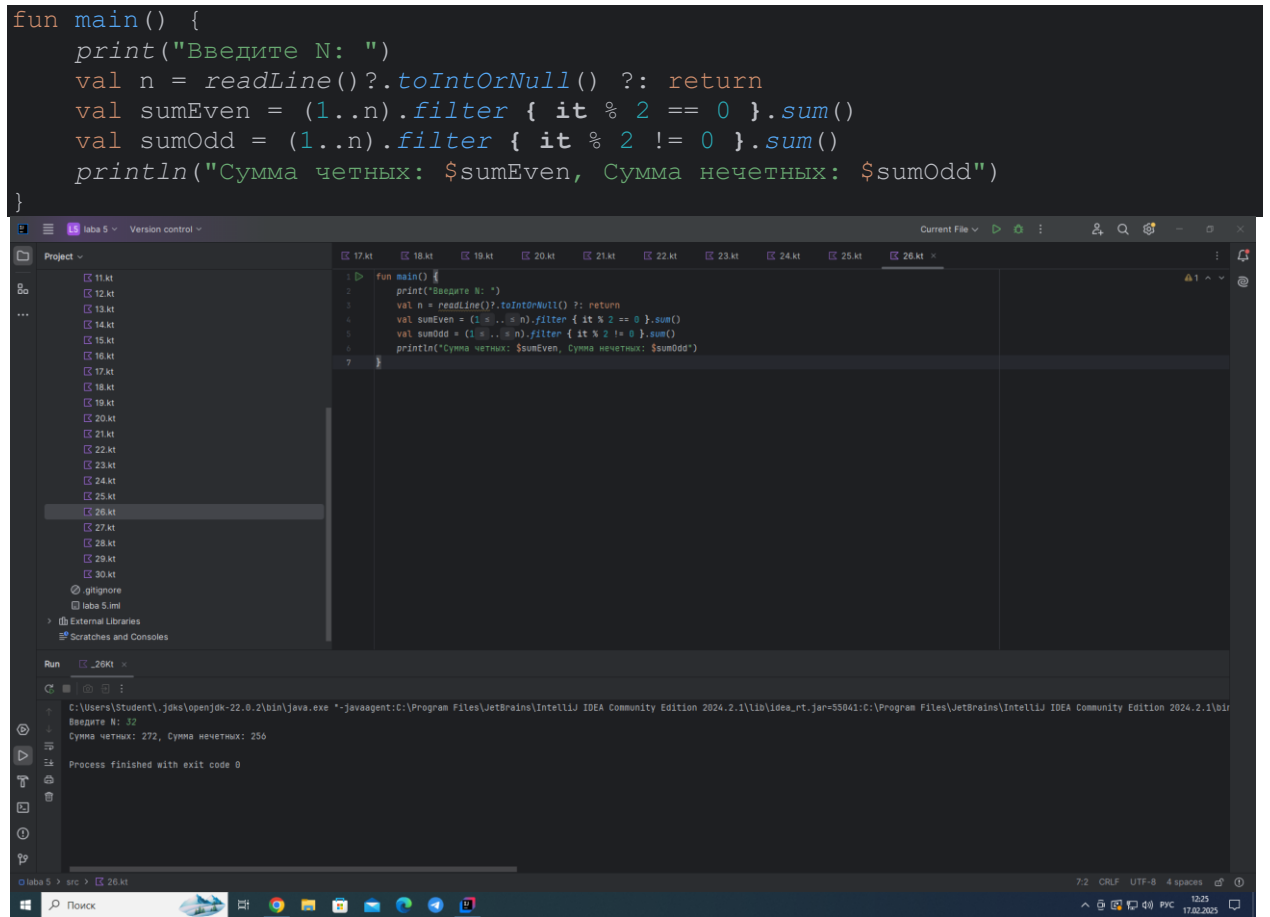
## Задание 25:

```
fun main() {  
    for (i in 1..10) {  
        println("$i^3 = ${i * i * i}")  
    }  
}
```



## Задание 26:

```
fun main() {
    print("Введите N: ")
    val n = readLine()?.toIntOrNull() ?: return
    val sumEven = (1..n).filter { it % 2 == 0 }.sum()
    val sumOdd = (1..n).filter { it % 2 != 0 }.sum()
    println("Сумма четных: $sumEven, Сумма нечетных: $sumOdd")
}
```



The screenshot displays the IntelliJ IDEA IDE interface. The top pane shows the Kotlin source code for a program that calculates the sum of even and odd numbers from 1 to N. The bottom pane shows the Run console output, which displays the input value N=32 and the resulting sums: Сумма четных: 272, Сумма нечетных: 256. The Run console also shows the process finished with exit code 0.

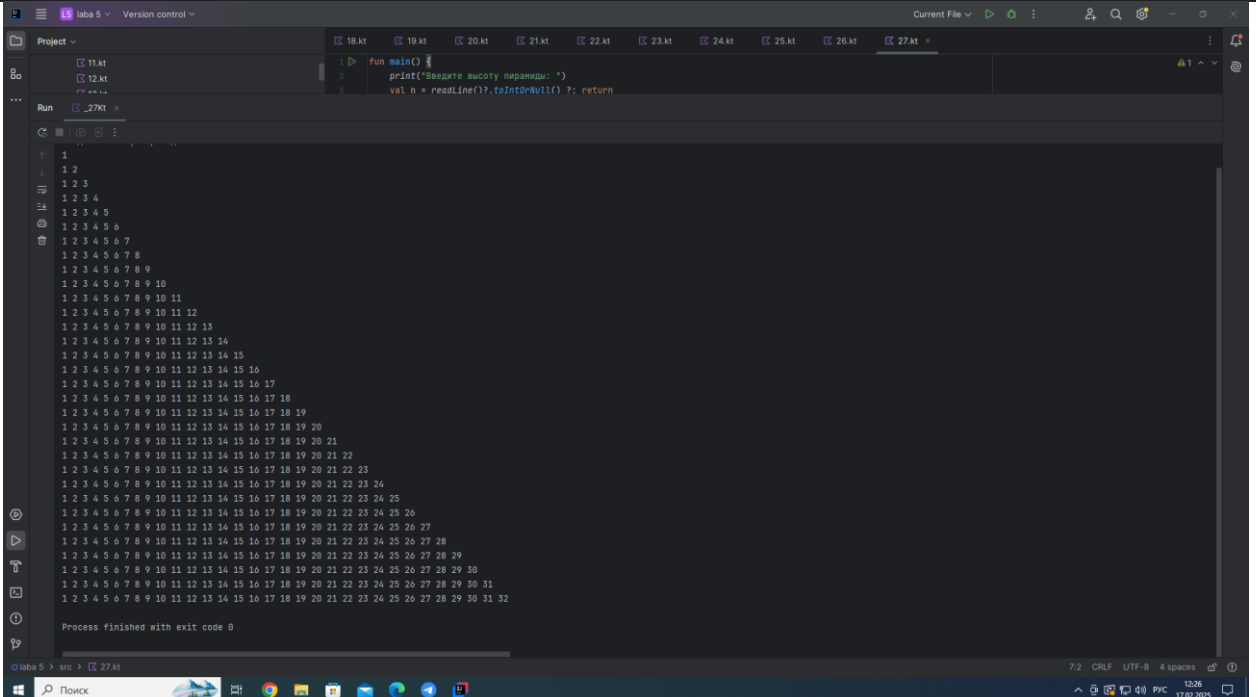
Run console output:

```
C:\Users\Student\jdk\openjdk-22.0.2\bin\java.exe -javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2024.2.1\lib\idea_rt.jar-55041:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2024.2.1\bin
Введите N: 32
Сумма четных: 272, Сумма нечетных: 256
Process finished with exit code 0
```



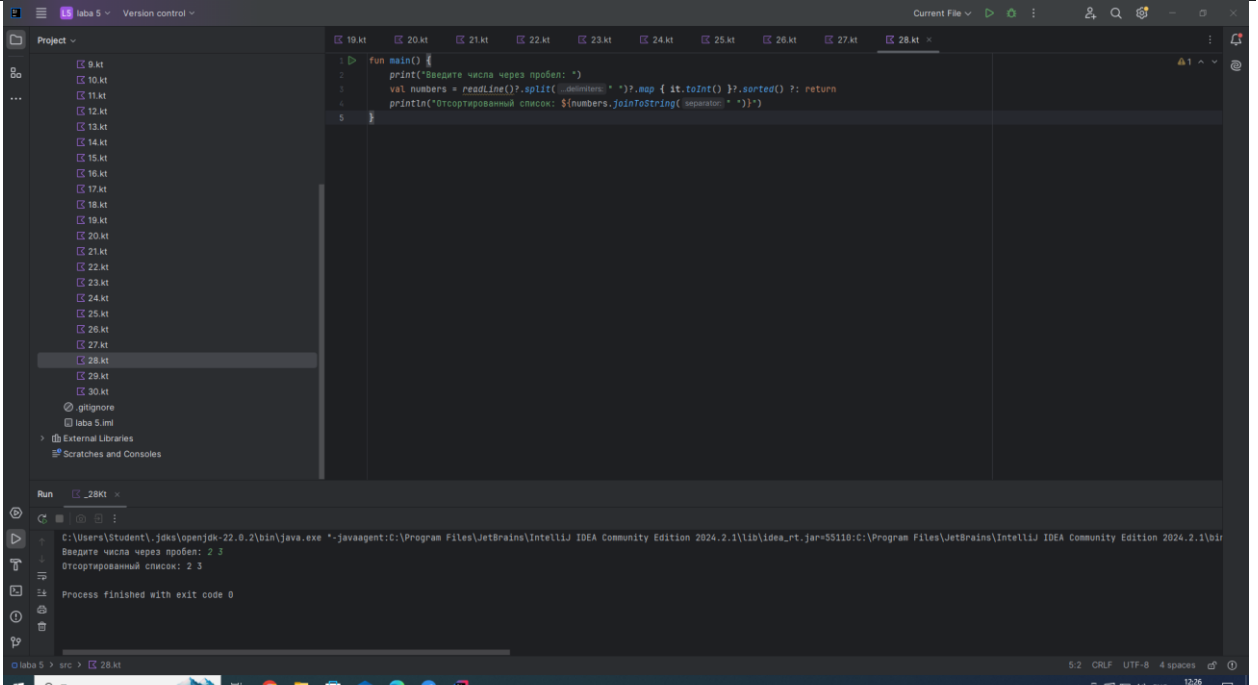
## Задание 27:

```
fun main() {
    print("Введите высоту пирамиды: ")
    val n = readLine()?.toIntOrNull() ?: return
    for (i in 1..n) {
        println((1..i).joinToString(" "))
    }
}
```



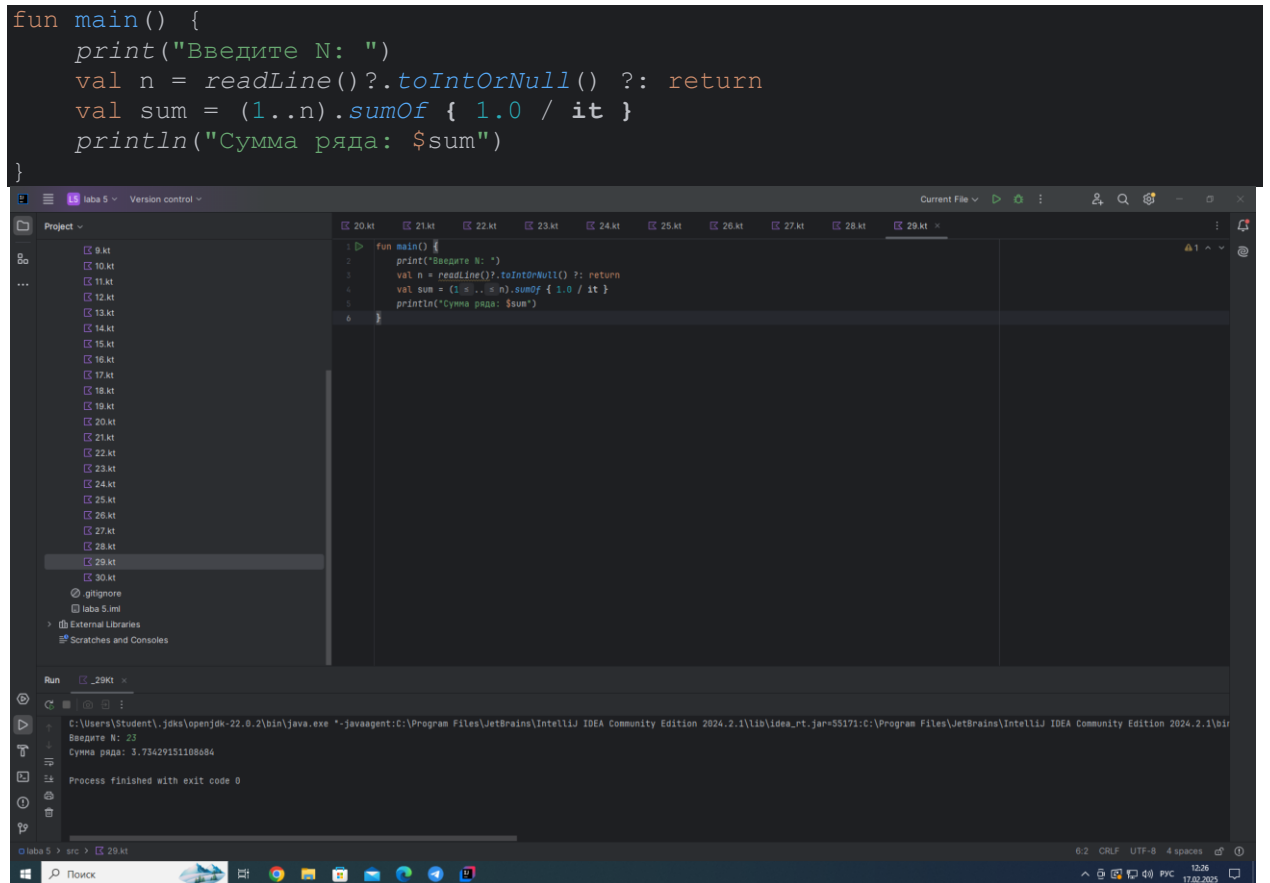
## Задание 28:

```
fun main() {
    print("Введите числа через пробел: ")
    val numbers = readLine()?.split(" ")?.map { it.toInt() }?.sorted() ?: return
    println("Отсортированный список: ${numbers.joinToString(" ")}")
}
```



## Задание 29:

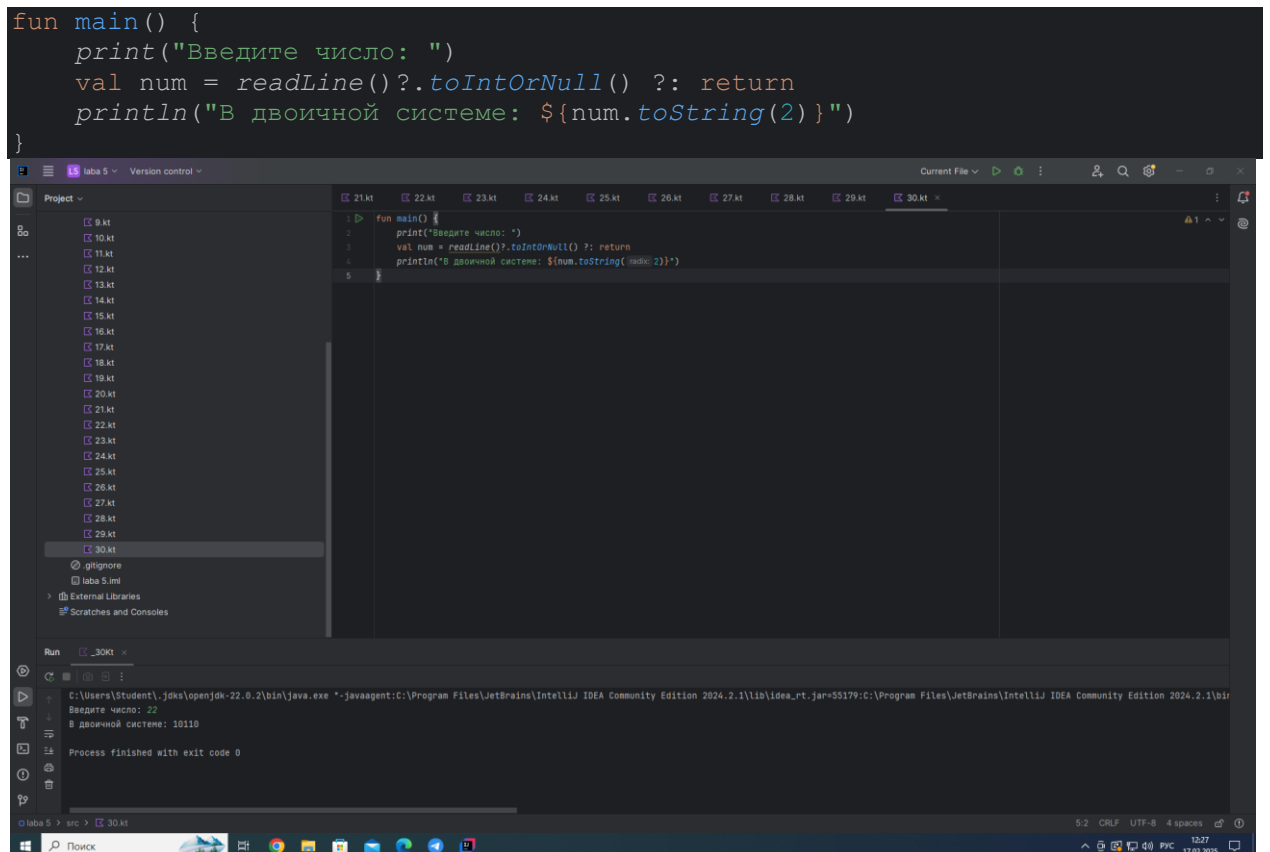
```
fun main() {
    print("Введите N: ")
    val n = readLine()?.toIntOrNull() ?: return
    val sum = (1..n).sumOf { 1.0 / it }
    println("Сумма ряда: $sum")
}
```



The screenshot shows the IntelliJ IDEA interface with a Kotlin file named 'lab5.kt'. The code defines a `main` function that prompts the user to enter a value `N`. It then calculates the sum of the harmonic series  $\sum_{i=1}^n \frac{1}{i}$  and prints the result. The Run console shows the output: 'Сумма ряда: 3.73429151108884'.

## Задание 30:

```
fun main() {
    print("Введите число: ")
    val num = readLine()?.toIntOrNull() ?: return
    println("В двоичной системе: ${num.toString(2)}")
}
```



The screenshot shows the IntelliJ IDEA interface with a Kotlin file named 'lab5.kt'. The code defines a `main` function that prompts the user to enter a number. It then converts the number to its binary representation using `toString(2)` and prints the result. The Run console shows the output: 'В двоичной системе: 10110'.