ASSIGNMENT 13.2

Problem Statement:

Fibonacci series (starting from 1) written in order without any spaces in between, thus producing a sequence of digits.

Write a Scala application to find the Nth digit in the sequence.

- Write the function using standard for loop
- Write the function using recursion

Solution:

Fibonacci series is a series of numbers in which each number is a sum of two preceding numbers. It starts with base numbers, 0 and 1 in follows a sequence: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89…

- Write a Scala application to find the Nth digit in the sequence using standard for loop:

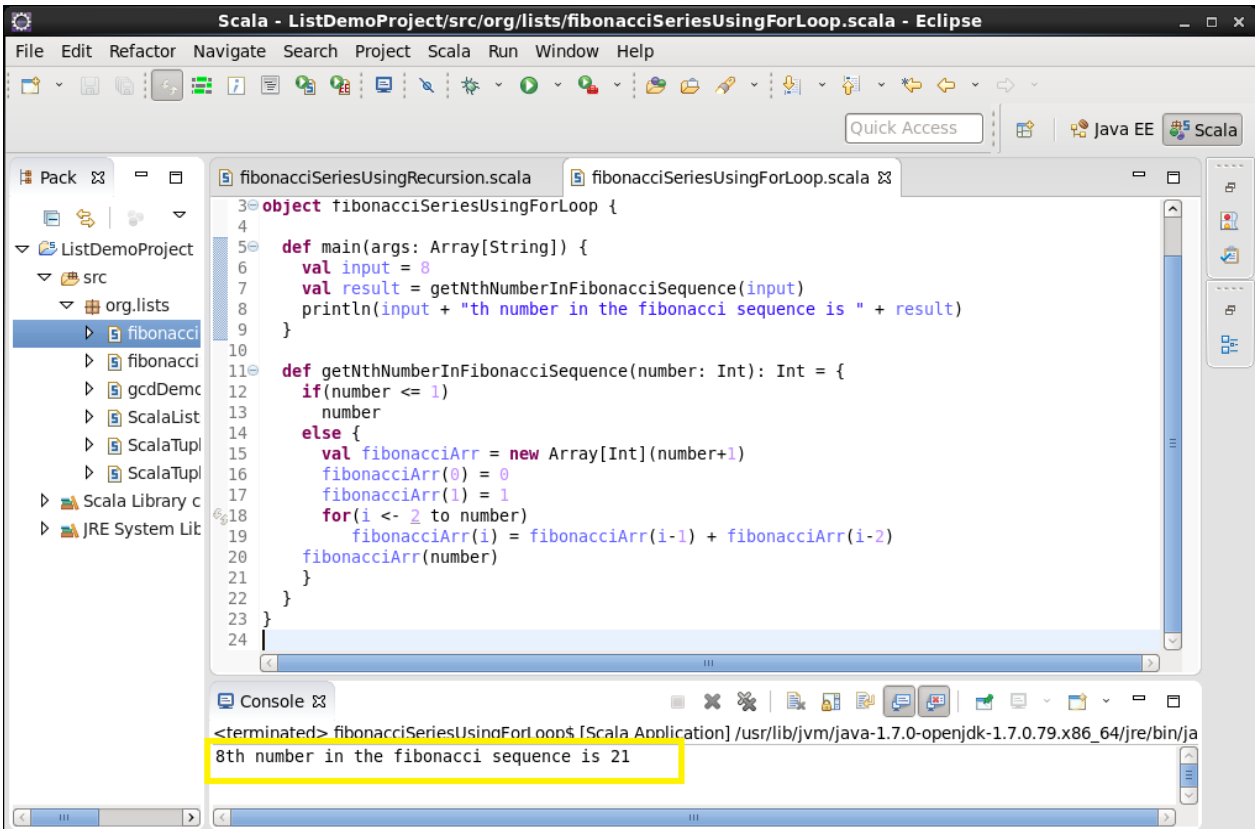
Here is the code snippet I have written using for loop to find out the nth digit in Fibonacci sequence:

```
object fibonacciSeriesUsingForLoop {
	def main(args: Array[String]) {
		val input = 8
		val result = getNthNumberInFibonacciSequence(input)	// method invocation
		println(input + "th number in the fibonacci sequence is " + result) // print result
	}

	def getNthNumberInFibonacciSequence(number: Int): Int = {
		if(number <= 1)			// check for base value condition
		   number
		else {
		   val fibonacciArr = new Array[Int](number+1)//define an array of size number+1
		   fibonacciArr(0) = 0				// first value in the Fibonacci series
		   fibonacciArr(1) = 1				//second value in the Fibonacci series
		   for(i <- 2 to number)			// loop until the given number
		        fibonacciArr(i) = fibonacciArr(i-1) + fibonacciArr(i-2)	// store sum of
		        fibonacciArr(number)		// two preceding values and return result
		}						// from nth element of the array
	}
}
```

Output:

8th number in the fibonacci sequence is 21



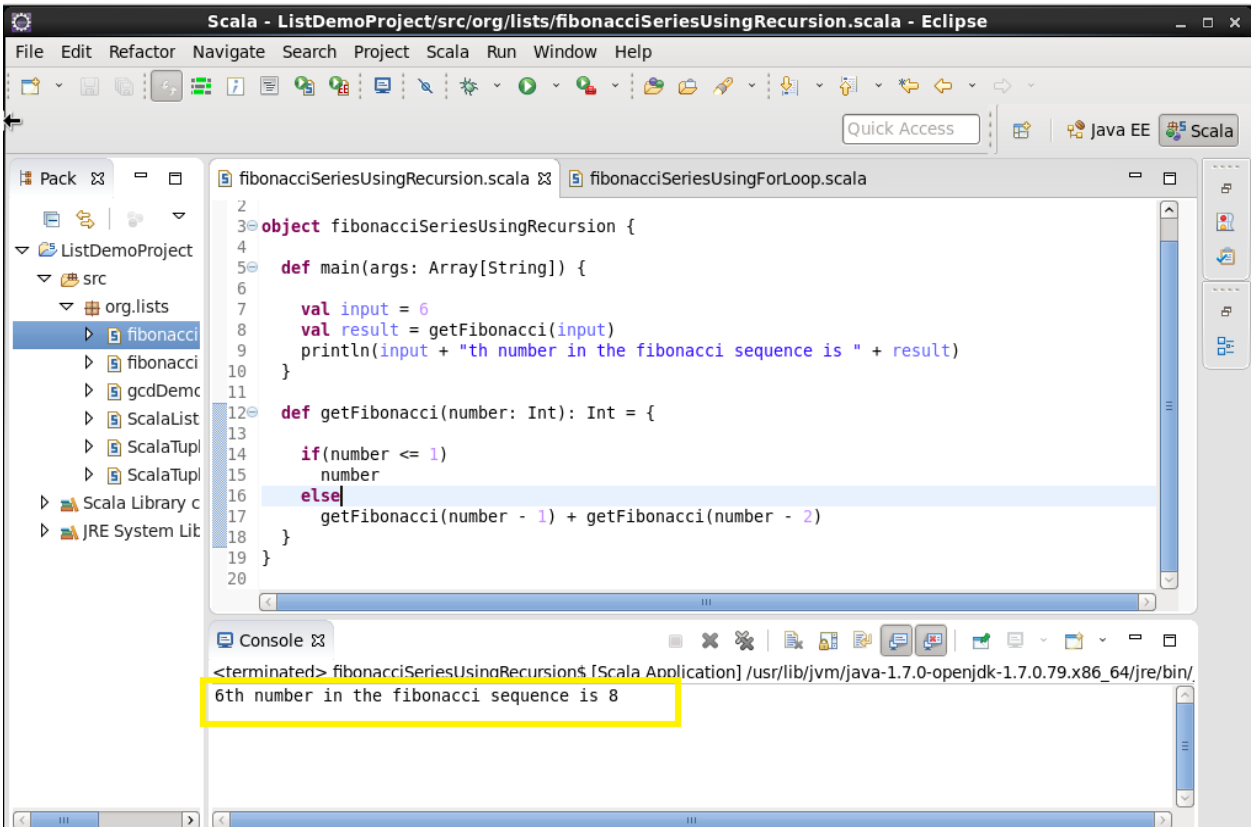
- Write a Scala application to find the Nth digit in the sequence using recursion:

```
object fibonacciSeriesUsingRecursion {

        def main(args: Array[String]) {
                val input = 6
                val result = getFibonacci(input)                  // method invocation
                println(input + "th number in the fibonacci sequence is " + result)   // print result
        }
        def getFibonacci(number: Int): Int = {
                if(number <= 1)                                   // check for base value condition
                        number
                else
                        getFibonacci(number - 1) + getFibonacci(number - 2) // invoke the function
                        // itself recursively taking two preceding values as input and calculate sum
                        of them
  }
}
```

Output:

6th number in the fibonacci sequence is 8



Known values:

getFibonacci(0) = 0

getFibonacci(1) = 1