**Exercise 2**

Fibonacci sequence is a sequence such that each number is the sum of the two preceding ones, starting from 0 and 1.

1. **non-recursive code**

public class fib {

public static void main(String[] args) {

System.out.println(fib(10));

}

static int fib(int n) {

if (n == 1 || n == 2) {

return 1;

} else {

int fib1 = 1;

int fib2 = 1;

int fib3 = 0;

for (int i = 3; i <= n; i++) {

fib3 = fib1 + fib2;

fib1 = fib2;

fib2 = fib3;

}

return fib3;

}

}

}

1. **non-tail recursive code**

public class fib\_non\_tail {

public static void main(String[] args) {

System.out.println(fib(10));

}

static int fib(int n) {

if (n == 1 || n == 2) {

return 1;

} else {

return fib(n - 1) + fib(n - 2);

}

}

}

1. **tail recursive code**

public class fib\_tail\_rec {

public static void main(String[] args) {

System.out.println(fibonacci(5));

}

static int fibonacci(int n) {

return fib(n, 1);

}

static int fib(int n, int k) {

if (n == 1 || n == 2) {

return k;

} else {

return fib(n - 1, k) + fib(n - 2, k);

}

}

}