5-1 Permutation 分数 8

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In mathematics, a permutation of a set is, loosely speaking, an arrangement of its members into a sequence or linear order, or if the set is already ordered, a rearrangement of its elements. The word "permutation" also refers to the act or process of changing the linear order of an ordered set.

The simplest example of permutations is permutations without repetitions where we consider the number of possible ways of arranging n items into n places.

In a similar manner, the number of arrangements of r items from n objects is considered a partial permutation. It is written as P_r^n (which reads "n permute r"), and is equal to the number $n(n-1)\cdots(n-r+1)$ (also written as $\frac{n!}{(n-r)!}$).

The following program reads two numbers n and r in, and prints out the value of P_r^n.

```
import java.util.Scanner;
import java.util.stream.IntStream;

public class Main {
    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        int n = in.nextInt();
        int r = in.nextInt();
        int res = IntStream.range( 1 2 分 , r 2 分 ).
            reduce( n 2 分 , (acc, k)-> acc*(n-k) 2 分 );
        System.out.println(res);
        in.close();
    }
}
```

FYR: In Java Doc, the `reduce` function of `Stream` is described as:

```
T reduce(T identity, BinaryOperator<T> accumulator)
```

It performs a reduction on the elements of this stream, using the provided identity value and an associative accumulation function, and returns the reduced value.

答案正确：8 分

5-2 模拟通信 分数 6

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1.训练目标

本题目考查Lambda表达式的使用。

2.业务要求

本题涉及一个接口Listener，代表监听器接口。一个类Communication，代表通信器类，依赖Listener接口。

3.输出内容

通过调用通信器类Communication的方法，打印消息发送和接收过程，类似如下

```
开始发送
收到3条信息
发送结束
```

4.需填空的代码

```
public class Communication {// 通信器类
    private Listener listener;// 监听器对象

    void send(String[] infos) {// 发送消息方法
        System.out.println("开始发送");
        System.out.println(listener.receive(infos));// 调用监听器listener的接收消息方法，传入消息数组infos参数
        System.out.println("发送结束");
    }

    public static void main(String[] args) {
        Communication communication = new Communication();// 创建通信器类对象
        communication.listener = infos -> "收到" + infos.length + "条信息"; 4 分 ;// 使用Lambda表达式配置监听器，Lambda表达式中返回形如"收到X条信息"的字符串，X为入参数组内元素的个数
        String[] infos = new String[]{"XA", "YB", "OO"};
        communication.send(infos);
    }
}

@FunctionalInterface 2 分 // 使用注解标记函数式接口
interface Listener {// 监听器类
    String receive(String[] infos);// 接收消息方法
}
```

答案正确：6 分