

CMSC 131 Fall 2004 Quiz 2 Solution

Here is one possible solution. Remember that the `JOptionPane` returns a string value, and so it must be converted to an `int` using either `Integer.parseInt()`. We declared a variable `product` to be a long integer (since the product of numbers can be very large). In this variable we hold a “running product” of the values from `lowerBound` up to `upperBound`. We initialize its value to 1. We explicitly chose 1 rather than 0 as the initial value, because if `upperBound` is less than `lowerBound`, we will not execute the loop at all, and 1 is the desired result in this case. (General hint: When a loop involves computing a running sum, 0 is a good initial value, when it involves computing a running product, 1 is a good initial value.) We could have created a new counter variable that runs from `lowerBound` to `upperBound`, but instead we just chose to increment `lowerBound` until it exceeds `upperBound`.

Note that we used a `while` loop (not a `do-while`) because it is possible that the loop may not be executed at all (which happens if `upperBound < lowerBound`). As usual, because we use `JOptionPane`, we explicitly terminate the program using `System.exit(0)`.

Also observe that the expression “`product *= lowerBound`” is implicitly computing the product of a long and an `int`. Recall that, by the process of *arithmetic promotion*, Java converts the `int` into a long before performing the multiplication.

```
public class RangeProduct {
    public static void main(String[] args) {
        String lowerBoundStr, upperBoundStr;
        lowerBoundStr = JOptionPane.showInputDialog("Enter lower bound");
        upperBoundStr = JOptionPane.showInputDialog("Enter upper bound");

        int lowerBound = Integer.parseInt(lowerBoundStr);
        int upperBound = Integer.parseInt(upperBoundStr);

        long product = 1;
        while (lowerBound <= upperBound) {
            product *= lowerBound;
            lowerBound++;
        }

        JOptionPane.showMessageDialog(null, "Range Product is " + product);
        System.exit(0);
    }
}
```