

```

1 /**
2  * Gets a command-line argument (int), and checks if the given number is perfect.
3  * (30 points) A number is said to be perfect if it equals the sum of all its divisors.
4  * For example, the
5  * divisors of 6 are 1, 2, and 3, and  $6 = 1 + 2 + 3$ . Therefore 6 is a perfect number.
6  * Write a program
7  * ( perfect.java ) that takes an integer command-line argument value, say N, and checks
8  * if the
9  * number is perfect. Here are some examples of the program's execution:
10
11  * Test your program on, at least, the following numbers: 6, 24, 28, 496, 5002, 8128.
12  * Hint: four of
13  * these numbers are perfect. You can find a list of perfect numbers in the Internet,
14  * and use your
15  * program to verify that some of them are indeed perfect.
16
17  * Implementation tips: We suggest the following strategy. When you get a number, say
18  * 24, start
19  * by building the string " 24 is a perfect number since  $24 = 1 + \dots$ ". Next, enter a loop
20  * that looks for
21  * all the divisors of 24. This loop can be identical to what you did in the Divisors
22  * program. When
23  * you find a divisor, append " + " and this divisor to the end of the string. At the
24  * end of the loop,
25  * you will know if 24 is indeed a perfect number. If so, print the string that you've
26  * constructed all
27  * along. If 24 is not a perfect number, ignore the string that you've constructed and
28  * print instead
29  * " 24 is not a perfect number ".
30  */
31 public class Perfect {
32     public static void main (String[] args) {
33         int numToInspect = Integer.parseInt(args[0]);
34         int divisor = 1;
35         int divisorsSum = 0;
36         String divisorsSumCalculation = "";
37
38         while (numToInspect > divisor) {
39             if (numToInspect % divisor == 0) {
40                 divisorsSum = divisorsSum + divisor;
41
42                 String stringedDivisor = "" + divisor;
43
44                 if (divisorsSumCalculation == "") {
45                     divisorsSumCalculation = divisorsSumCalculation + stringedDivisor;
46                 } else {
47                     divisorsSumCalculation = divisorsSumCalculation + " + " +
48 stringedDivisor;
49                 }
50             }
51             divisor++;
52
53             String message = "";
54
55             if (numToInspect == divisorsSum) {
56                 message = numToInspect + " is a perfect number since " + numToInspect + " = "
57 + divisorsSumCalculation;
58             } else {
59                 message = numToInspect + " is not a perfect number";
60             }
61
62             System.out.println(message);
63         }
64     }
65 }

```