Assignment 6: Divisor Sum

EC602 Design by Software

Fall 2021

Contents

1 Introduction

1.1 Assignment Goals

The assignment goals are to help you learn about

- arithmetic operators
- proper choice of integer types
- iteration
- formatting output

1.2 Group Size

The maximum group size is 2 students.

1.3 Due Date

The assignment is due 2021-11-12 at 23:59:59

1.4 Assignment Value

This assignment is worth 5 points.

1.5 Late policy

Late assignments will be accepted until the beginning of the lecture immediately following the due date, or for 48 hours, whichever is less.

If the *natural grade* on the assignment is g, the number of hours late is h, and the number of hours between the assignment due time and the next class is H, the new grade will be

```
(h > H) ? 0 : g * (1- h/(2*H))
```

If the same assignment is submitted ontime *and* late, the grade for that component will be the maximum of the ontime submission grade and the scaled late submission grade.

1.6 Submission Link

You can submit here: divsum hw6 submit link

2 Divisor Sums

2.1 Definition

- a divisor of an integer n is an integer m that may be multiplied by some other integer p to produce n.
- the proper divisors of an integer n are all positive divisors of n not including n itself.
- the *proper divisor sum* of n is the sum of all of its proper divisors.

The proper divisor sum of 1 is not well defined.

2.2 The program

Write a C++ program `divsum.cpp` which which reads numbers, one at a time, from the terminal input, and outputs the proper divisors and the proper divisor sum for that integer in an equation format.

Here is an example:

```
> divsum
6
6: 1+2+3 = 6
888
888: 1+2+3+4+6+8+12+24+37+74+111+148+222+296+444 = 1392
0
```

```
>
```

Note: spaces will be ignored, but punctuation symbols (`:+=`) must be in the correct places.

Your program should handle the calculation of proper divisor sums for all numbers between 2 and 2147483647.

Your program should continue answering about the proper divisor sums of numbers until 0 is entered, at which time the program should exit silently.

2.3 Restrictions

You may include `iostream` and `cstdint` but no other library is allowed.

2.4 Checker

There is a checker available here:

hw6_divsum_check.py