

Perfect Number

Greek mathematicians took a special interest in numbers that are equal to the sum of their proper divisors, which is simply any divisor less than the number itself. They called such numbers perfect numbers. For example, 6 is a perfect number because it is the sum of 1, 2, and 3, which are integers less than 6 that divide evenly into 6. Similarly, 28 is a perfect number because it is sum of 1, 2, 4, 7, and 14.

Write a predicate function `isPerfect()` that takes an unsigned integer `n` and returns true if `n` is perfect, and false otherwise. Test your implementation by writing a main program in C++ that uses the `isPerfect()` function to check for perfect numbers in the range 1 to 9999 by testing each number in turn. When a perfect number is found, your program displays it on stdout and also displays its divisors. The first two lines of the output should be `6 = 1 + 2 + 3` and `28 = 1 + 2 + 4 + 7 + 14`. Your program should find two other perfect numbers in the range as well.

Each perfect number `n` should be displayed as `n = d1 + d2 + ... + dm`, where `d1, d2, ..., dm` are the divisors of `n` with `d1 = 1`. Generate such sequence as a C++ string by a `divisors` function. To convert each divisor (an integer) to a string, you can use the conversion function `to_string()` from the C++ library.

* Programming Notes:

- Name your source file as `prog2.cc` and your header file as `prog2.h`.
- Guard the statements in your header file using the following format:

```
#ifndef H_PROG2 // not defined any place else
#define H_PROG2 // same const value as for ifndef directive
// put all statements for your header file here
#endif
```
- Include all system header files (you need in your program) in your header file `prog2.h`. For example, to gain access to the `iostream` library, which defines a set of simple I/O operations, insert the line `#include` in your header files, and to use the strings in your program, insert the line `#include` in your header file; and at the top of your source file `prog2.cc`, insert your header file by the statement: `#include "prog2.h"`. Define the constant value 9999 as an unsigned integer and put its definition in the program header file. Also put the prototypes of all your functions in the header file as well.