this Maple code is a procedure to find the proper divisors of a given positive whole number.

Very exciting

```
ProperDivisors := proc(n);
 local d, count;
 count := 0 :
 for d from 1 to n/2 do
 if mod(n, d) = 0 then count := count + 1 : print("   One proper divisor of ", n, " is the number ", d);
      end if;
 end do;
 print(" and that is all of them.  ");
 print(" count of proper divisors is ", count);
 end proc;
```

```
proc(n)                                                                                   (1)
    local d, count;
    count := 0;
    for d to 1/2*n do
        if mod(n, d) = 0 then
            count := count + 1; print("   One proper divisor of ", n, " is the number ", d)
        end if
    end do;
    print(" and that is all of them.  ");
    print(" count of proper divisors is ", count)
end proc
```

Yeah compiles

```
ProperDivisors(3)
>
                        "   One proper divisor of ", 3, " is the number ", 1
                                 " and that is all of them.  "
                               " count of proper divisors is ", 1                          (2)
> ProperDivisors(19)
                        "   One proper divisor of ", 19, " is the number ", 1
                                 " and that is all of them.  "
                               " count of proper divisors is ", 1                          (3)
```

#We see that count of proper divisors for a prime number is always one. By observation.

```
ProperDivisors(5·7·11·13·17)
>
                     "   One proper divisor of ", 85085, " is the number ", 1
```

"   One proper divisor of ", 85085, " is the number ", 5
"   One proper divisor of ", 85085, " is the number ", 7
"   One proper divisor of ", 85085, " is the number ", 11
"   One proper divisor of ", 85085, " is the number ", 13
"   One proper divisor of ", 85085, " is the number ", 17
"   One proper divisor of ", 85085, " is the number ", 35
"   One proper divisor of ", 85085, " is the number ", 55
"   One proper divisor of ", 85085, " is the number ", 65
"   One proper divisor of ", 85085, " is the number ", 77
"   One proper divisor of ", 85085, " is the number ", 85
"   One proper divisor of ", 85085, " is the number ", 91
"   One proper divisor of ", 85085, " is the number ", 119
"   One proper divisor of ", 85085, " is the number ", 143
"   One proper divisor of ", 85085, " is the number ", 187
"   One proper divisor of ", 85085, " is the number ", 221
"   One proper divisor of ", 85085, " is the number ", 385
"   One proper divisor of ", 85085, " is the number ", 455
"   One proper divisor of ", 85085, " is the number ", 595
"   One proper divisor of ", 85085, " is the number ", 715
"   One proper divisor of ", 85085, " is the number ", 935
"   One proper divisor of ", 85085, " is the number ", 1001
"   One proper divisor of ", 85085, " is the number ", 1105
"   One proper divisor of ", 85085, " is the number ", 1309
"   One proper divisor of ", 85085, " is the number ", 1547
"   One proper divisor of ", 85085, " is the number ", 2431
"   One proper divisor of ", 85085, " is the number ", 5005
"   One proper divisor of ", 85085, " is the number ", 6545
"   One proper divisor of ", 85085, " is the number ", 7735
"   One proper divisor of ", 85085, " is the number ", 12155
"   One proper divisor of ", 85085, " is the number ", 17017
" and that is all of them. "
" count of proper divisors is ", 31 **(4)**

> *ProperDivisors*(5·7)

"   One proper divisor of ", 35, " is the number ", 1
"   One proper divisor of ", 35, " is the number ", 5
"   One proper divisor of ", 35, " is the number ", 7
" and that is all of them. "
" count of proper divisors is ", 3 **(5)**

> # $2^2 - 1 = 3$ *so every semi − prime will have three proper divisors.*
#*Given a composite number that is the product of distinct prime numbers,*
That is, no prime powers,
So $c = p1 \cdot p2 \cdot p3 \cdot ...pn$ *then*
count of proper divisors of c is $2^n - 1$. *Quite an insight.*
we try 5 distinct prime factors and find count to be $31 = 2^5 - 1$
The count is $2^n - 1$ *just like Mersenne numbers. Weeee Houray.*
That is probrably in a textbook somewhere.
Insight by Matt C Anderson
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