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Primitive Root Modulo n

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Hey folks,

Today we are going to talk about the concept of *primitive root modulo n* and a <u>codeforces</u> problem on it.

Definition

x is a primitive root modulo of a number n if for all 'a' such that 'a' is coprime to 'n' there exist a 'k' for which the following condition holds true.

$x^k = a \pmod{n}$

Actually the above condition can also be written in simpler words like:

let A is a set of all numbers coprime to 'n' and are less than 'n' then for every 'x' in A if <u>multiplicative order</u> of 'x' is equal to the <u>euler_totient_function(n)</u> then 'x' is primitive root modulo 'n'.

Fyamnle:

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if n=14 then A= {1,3,5,9,11,13}

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x x, x2, x3, ... (mod 14)

1:1

3 : 3, 9, 13, 11, 5, 1

5 : 5, 11, 13, 9, 3, 1

9:9,11,1

11:11,9,1

13 : 13, 1

only 'x' = 3 and 5 satisfied the given condition so they are primitive root modulo 'n'.

Note: It is possible that there is no primitive root modulo 'n' for example there is no primitive root modulo 'n' for 15.

Finally, the no of primitive root modulo 'n' of a give number are

euler_totient_function(euler_totient_function(n))

the problem on codeforces is also the same in which we have to calculate the no of primitive root modulo 'n'.

External Links:

My Solution

primitive root modulo

euler totient function

multiplicative order

return 42;

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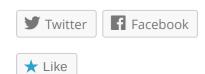
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