## how can we tell if a number has an even or odd number of factors? For every factor *n* has below \sqrt{n}it has one above \sqrt{n}. This suggests that unless *n* is a perfect square, it has an even number of factors.

## fzort: This problem also has a O(1) solution. It's easy to compute the index *d* of the diagonal a given number *n* is in. The number of elements before diagonal *d* is

n={\frac  {d(d+1)}{2}}

, so the number *n* is in diagonal

d=\left\lfloor {\frac  {1+{\sqrt  {1+8n}}}{2}}\right\rfloor 

## **the smallest factor (other than 1) of a composite number is a prime.** 2.**we can express any composite number as the product of  prime factors in one way only.**

using these theory we can actually get prime factors of a number quite easily. how? again go through these two bold lines and think lil bit.  well, i’m saying how .  
 no need to  
1.generate prime.  
2.check for primality  
3. declare array.