Class 21

Tuesday, August 10, 2021 10:20 PM

$$8! = \underline{2} \times \underline{3} \times \underline{2} \times \underline{2} \times \underline{5} \times \underline{2} \times \underline{3} \times \underline{7} \times \underline{2} \times \underline{2} \times \underline{2}$$

$$= 2^{(7)} \times 3^{(2)} \times 5^{(1)} \times 7^{(1)}$$

$$= 7 + 2 + 1 + 1$$

$$= 11$$

—o—

$n!$ $\longleftrightarrow$ p

$$count(p,n) = \left\lfloor \frac{n}{p} \right\rfloor + \left\lfloor \frac{n}{p^2} \right\rfloor + \left\lfloor \frac{n}{p^3} \right\rfloor + \dots + 0$$

$$= \left\lfloor \frac{8}{2} \right\rfloor + \left\lfloor \frac{8}{4} \right\rfloor + \left\lfloor \frac{8}{8} \right\rfloor + \left\lfloor \frac{8}{16} \right\rfloor$$

$$= 4 + 2 + 1 + 0 = (7)$$

$$\left(\frac{n}{\ln N}\right) \times \log N \approx n$$

$$= n \cdot \frac{\log N}{\ln N}$$

$$= n \cdot \frac{\log_2 N}{(\log_e N)} = n \cdot \frac{\log_2 N}{\left(\frac{\log_2 N}{\log_2 e}\right)} = n \cdot \log_2 N \cdot \frac{\log_2 e}{\log_2 N}$$

$$= n \cdot \log_2 e$$

$$= 2 \cdot n \approx n$$

—o—

n	
2	1
3	2
4	4
5	5
6	

$5 = 2 \times 3 \times 2 \times 2 \times 5$

$= 2^3 \times 3^1 \times 5^1$ → $3+1+1 = 5$

$6 = 2 \times 3 \times 4 \times 5 \times 6$

$4 \to 2^2$, $6 \to 2 \times 3$

$= 2^4 \times 3^2 \times 5^1$ → $5+2 \to 7$

2 × 3

$f(2) = 1$

$f(3) = f(2) + pc(3)$

$f(5) = 5$

$f(6) = f(5) + 2$

$f(6) = 7$

$$\left(\sqrt{2} + \sqrt{3} + \sqrt{4} + \sqrt{5} + \sqrt{6} + \cdots + \sqrt{N}\right)$$

$$\frac{1}{H_N^{1/2}} = \frac{1}{\sqrt{H_N}} =$$

15 × MAX

1 +