Class 14 (Ext)

Saturday, August 20, 2022 10:49 PM

```
int getExp(int a, int b)
{
    if(b==0) return 1;
    if(b%2==0)
    {
        auto t = getExp(a, b/2);
        return (t*t);
    }
    return a*getExp(a, b-1);
}
```

even = জোড়

odd = বিজোড়

5^{31} (a^b)

5×5^{30}

$$^{212}C_{73} = \frac{212!}{73!(139!)} \qquad {}^{n}C_{r} = \frac{n!}{r!(n-r)!}$$

$$= \frac{212!}{73!\,139!} \text{ MOD } M$$

$$= [(212!) \% M] \times [(73!\,139!)^{-1} \%$$

$$= [616613957] \times [(157550195)^{-1}$$

$$= 616613957 \times (157550195)^{M-2}$$

$$= (616613957 \times 419647481)$$

$f(5) = 5 \times f(4) = 24 = 120$

$4 \times f(3) = 6 = 24$

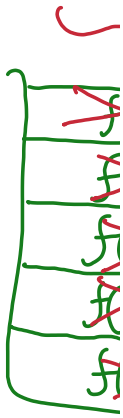
$3 \times f(2) = 2 = 6$

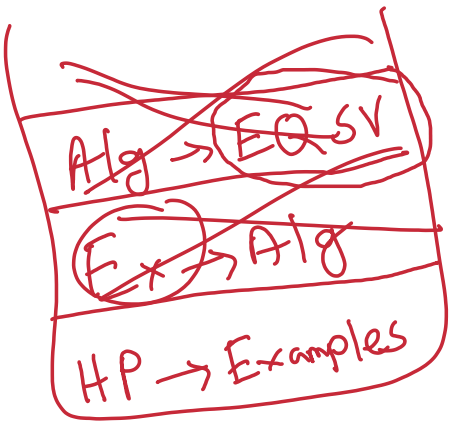
$2 \times f(1)$

$1 \times f(0)$

1

Rezv
1
2
6
24
120





N

$2^{10} \times \log_2 N$

$2^{3^{4^5}} \% M \rightarrow 2^b \% M$

10^{49}

$105 \% 10$

$2^b \rightarrow 2^{b \% \phi(M)}$

$[0, M-1]$

$\phi(11) = 10$

$2^{105} \% 11 = 2^5$

$2^b \% M \rightarrow 2^{b \% \phi(M)} \% M$

$$2^{3} \xrightarrow{k_1} 2^{4} \xrightarrow{k_2} 2^{3} \xrightarrow{k_3} 2 \longrightarrow$$

$$a^{b} \% M = a^{\phi(M)+b \% \phi(M)} \% M$$

$$2^{3} \% 197 = 2^{1024} \% 196 = 2^{25} \%$$

$$2^{b} \% 197$$

$$3^{1024} \% 196$$