Power Using Recursion

PERA

Exponent $(n)^n$

$2^5 = 2*2*2*2*2$

$n^n = n * n * n * n$ --- for n times

pow $(n,n) = (n * n * n * n$ --- $*$ n-1 times $) * n$

$pow(n,n) = pow(n,n-1) * n$

$$pow(n,n) = \begin{cases} 1 & , n=0 \\ pow(n,n-1)*n & , n>0 \end{cases}$$

```
int pow(int n, int n)
if(n==0)
 return 1;
return pow(n,n-1)*n
}
```

pow(2,9)
↓ 512
pow(2,8) * 2 = 512
↓ 256
pow(2,7) * 2 = 256
↓ 128
pow(2,6) * 2 = 128
↓ 64
pow(2,5) * 2 = 64
↓ 32
pow(2,4) * 2 = 32
↓ 16
pow(2,3) * 2 = 16
↓ 8
pow(2,2) * 2 = 8
↓ 4
pow(2,1) * 2 = 4
↓ 2
pow(2,0) * 2 = 1
↓ 1
(1)

9 tane

carpma

işlemi gerçekleştir

işlem bitir ve bana daha ekle ihtiyacın olduğunu söyle

kalıtım evet

$2^9 = (2^2)^4$ 4

$2^9 = 2.(2^2)^4$ 4

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```
int pow(int m, int n) {
    if (n==0)
        return 1;
    if (n%2==0)
        return pow(m*m, n/2);
    else
        return m*pow(m*m, (n-1)/2);
}
```

pow(2,9) = 2^9

5 ↓ $2 * pow^{6}(2^2, 4) = 2^9$ ⟩ 6 kere

$2^2 * 2^2$ ↑ $pow^{4}(2^4, 2) = 2^8$ çağrılır

$2^4 * 2^4$ ↑ $pow^{3}(2^8, 1) = 2^8$ gerçekleşir

$2^8 * 2^8$ ↑ $2 * pow^{1}(2^{16}, 0) = 2^8$

↓

1

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