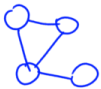


$3^n + 2^n \to 2.44^n$

$O(2^n n^2)$

$O(2.0001^n)$

```
for m = 1..2^n - 1:
    dp[m] = +∞
    for (s = m; s ≠ 0; s = (s-1) & m)
        if ok[s]:
            dp[m] ← dp[m\s] + 1
```

for (m)

for(s⊆m)

$2^{|m|}$

$\sum_{k=0}^{n} 2^k \binom{n}{k} =$

$= 3^k$

$\sum_{k=0}^{n} 1.44^k \binom{n}{k} =$

$= 2.44^n$

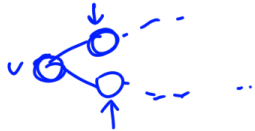
```
def List(Cur, Rem) {
    if (Rem==0)
        print(cur)
        return
```

$\forall$: $v \in Rem$, $deg_{Rem}[v] \to min$ (n)

① List(Cur+{v}, Rem\{v}\G[v])

② for $u \in (G[v] \cap Rem)$:
List(Cur+{u}, Rem\{u}\G[u])

}



$$T(n) \leftarrow (k+1)\, T(n-(k+1))$$

$k = \deg[v]$

$$T(n) = \max_{k'} k' T(n-k')$$

$$T(n) = \Theta(\lambda^n)$$

$$\lambda^n = k' \lambda^{n-k'}$$

$$\lambda^{k'} = k'$$

$$\lambda = (k')^{1/k'}$$

$\max_{k'} (k')^{1/k'}$ $\qquad (x^{1/x})'$ $\quad x = e$

$k' = 1 \Rightarrow 1$

$k' = 2 \Rightarrow 2^{1/2} = 1.4142\ldots$ $< e$

$k' = 3 \Rightarrow 3^{1/3} = 1.4422$ $\qquad 2.4423$

$k' = 4 \Rightarrow 4^{1/4} = 1.4142$

$k' = 5 \Rightarrow 5^{1/5} = 1.37$

Meet In The Middle

Subset Sum

$x_1 \dots x_n$

Эли подмнво суммы S?

nS

2^n ~

$dp[i][S] = 1/0$

$1 \dots i, S$ => можно или нельзя

$dp[i][S] = dp[i-1][S]$

OR $dp[i-1][S-x_i]$

$n = 42$

$S = 10^8$

$2^{n/2}$

$2^{n/2}$ L $\quad 2^{n/2}$ R

X y | Z w

0 0

X z

y w

x+y Z+w

for $\ell \in L$: 1) Хешмин. $O(2^{n/2})$

if $S - \ell \in R$: 2) Сортируем $(R) + BS/2^{yk}$.

print (Yes) $O(2^{n/2} n)$

Рюкзак с стоимостями:

$x_1, \ldots, x_n$

$y_1, \ldots, y_n$

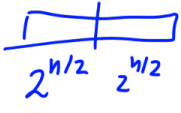
$x_{i_1} + \ldots + x_{i_k} \le S$

$y_{i_1} + \ldots + y_{i_k} \to \max$

$O(nS)$

2^n,

$2^{n/2}$.



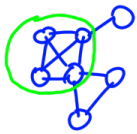
for $(x_{sum}, y_{sum}) \in L$:

when $(x', y') \in R$: $\quad x' \leq S - x_{sum}$

$y' \to max$

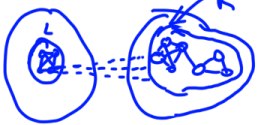
$$2^{n/2} \cdot n$$

Клики



$2^n \cdot poly(n)$

$2^{n/2}$



$2^{n/2} \cdot poly(n)$

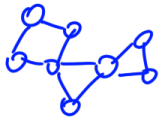
MAXCLIQUE[R] = {
|R|, R - клика
max(MAXCL[R-v]), иначе
v∈R

3

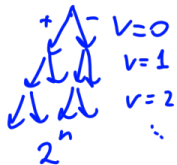
F[msk] = & G[v]
v∈msk

$2^{n/2} \cdot poly(n)$

|L| + |MAXCLIQUE[F[L]]|



2^h



findClique(Set){ if(cache) return

curV

if (Set==0)

return 0;

v ← min (1) nonadjacency element set

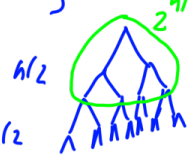
return MAX(FindClique(Set \ {v}), 1 + FindClique(Set ∩ G[v]))

v deleted

v edges

Cache[Set]

3



$2^{n/2}$

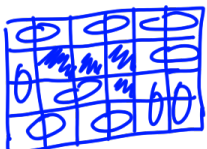
set = 1111111111 (n/2 ones)

0000010101000

$2^{n/2}$

$\Rightarrow 2^{n/2} \cdot n$

ДР по изломанному (скошенному) профилю.



Перебор.

Visited()

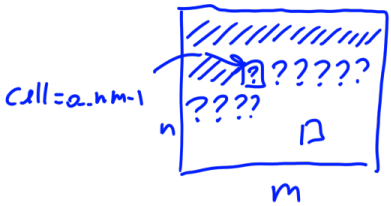
$2^{nm/2} \cdot nm$

2^m

```
brute(state) if state in cache:
                  ret cache[state]
    if full:
        return 1
    cell ← next bus ne 3. stanica
ret cache[st] = brute(state + 19) +
                + brute(state + 10)
```

```
0 1 0 1
0 1 1 1
0 1 1 0
```

$2^m \cdot \text{poly}(n, m)$



$nm \quad 2^m$

$dp[cell][mask]$

$0..2^{m+1}-1$