Editorial:

m n j C_j i $S_i \subseteq \{1, \ldots, m\}$ q i $D_{t,i}$ t

1. j C_j
2. i $D_{t,i}$
3.

- S j C_j
- j i $j \in S_i$ $+\infty$
- i T $D_{t,i}$

$\sum_{i=1}^{n} D_{t,i}$

$\rightarrow$ $O(q \cdot \text{maxflow})$

CDQ

1.
2.
3.
4.

1.

$G = (V, E)$

$$
\begin{aligned}
V &= \{S, T\} \cup \{R_1, \ldots, R_m\} \cup \{P_1, \ldots, P_n\} \\
E &= \{(S, R_j) \mid j = 1, \ldots, m\} \\
&\quad \cup \{(R_j, P_i) \mid j \in S_i\} \\
&\quad \cup \{(P_i, T) \mid i = 1, \ldots, n\}
\end{aligned}
$$

$$c(S, R_j) = C_j$$
$$c(R_j, P_i) = +\infty$$
$$c(P_i, T) = D_{t,i} \quad ()$$

Dinic $V = n + m + 2 \leq 102E \leq n \cdot m + n + m \leq 2600$

2.

(P_i, T)

c_{old} $c_{\text{new}} > c_{\text{old}}$ P_i T $\Delta = c_{\text{new}} - c_{\text{old}}$

c_{old} $c_{\text{new}} < c_{\text{old}}$ $f \leq c_{\text{new}}$ $\Delta = f - c_{\text{new}}$

1. (P_i, T) c_{new}
2. T P_i Δ “” P_i
3. T P_i

3. CDQ

Algorithm 1 CDQ

```
1: procedure CDQ(l, r)
2:     if l = r then
3:         l
4:         ∑_i D_{l,i}
5:         return
6:     end if
7:     mid ← ⌊(l + r)/2⌋
8:     CDQ(l, mid)                                   ▷
9:
10:    for t = l to mid do
11:        for  i do
12:            (P_i, T)  D_{t,i}  D_{t+1,i}
13:        end for
14:    end for
15:     mid + 1
16:    CDQ(mid + 1, r)                               ▷
17:
18: end procedure
```

- (P_i, T)
-
-

4.

1. $D_{1,i}$
2. Dinic 1
3. CDQ(1, q)
4.

- **CDQ**$O(\log q)$
- $[l, r]$ n $O(n \cdot (mid - l + 1))$
- // $O(V \cdot E)$ Dinic
  - /
  -
  -
- $O(q \log q \cdot (n + m) \cdot E)$

- $O(V + E) = O(nm)$
- $O(\log q)$
- $O(q \cdot n)$
- $O(qn + nm)$

CDQ

1.
2. CDQ
3. /

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