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Today was just a regular day for everyone in Krypton until a news flashed that a meteor is going to destroy Krypton in X days. Krypton has N cities, some of which are connected by bidirectional roads. You are given a road map of Krypton; for every two cities C_i and C_j which are connected by a (direct) road from C_i straight to Cj you are given the value $t(i, j)$ which is the number of days to travel from city C_i to city C_j. (You can of course also go from a city C_m to city C_k without a direct road from C_m to C_k by going through a sequence of intermediate cities connected by direct roads.) In each city C_i the Krypton Government built q_i pods to carry inhabitants in case of any calamity, which will transport them to Earth. City C_i has population p_i. As soon as the people hear this news they try to save themselves by acquiring these pods either at their own city or in other city before the meteor destroys everything. Note that a pod can carry only one person. Find the largest number of invaders the Earth will have to deal with.

> **Step 1: deal with cities:**
> We can assume there is a graph with N vertices, every vertex has two elements(p_i, q_i)
>
> - Separate vertices as three part:
>
> 1. $p_i > q_i$ as excess population set(P).
> 2. $p_i = q_i$ as completed set(Z).
> 3. $p_i < q_i$ as excess pods set(Q).
>
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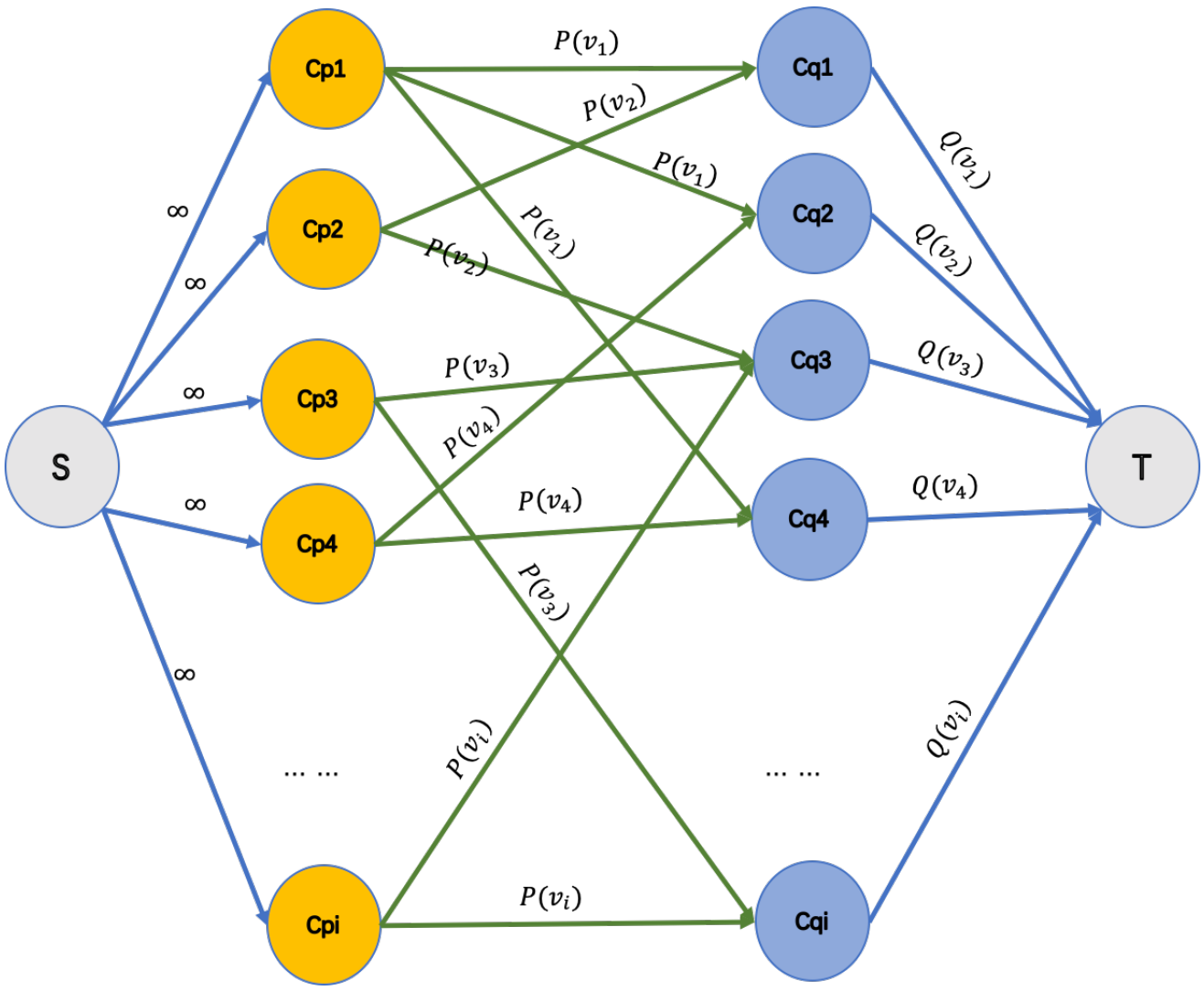
>
> -Delete vertices in completed part(**Z**).
> $Ze(v_i) = p_i$ (the number of people have left)
> -The value of every vertex in P are
> $P(v_i) = p_i - q_i$ (the number of people do not leave)
> $Pe(v_i) = q_i$ (the number of people have left)
> -The value of evert vertex in Q are
> $Q(v_i) = q_i - p_i$. (remaind number of pods)
> $Qe(v_i) = p_i$ (the number of people have left)
>
> - Determining cities in set Q of cities can reach within X days from the city of P.
>
> If the shortest path(**Dijkstra algorithm**) from Cp_i to Cq_j is smaller than X days, keeped Cq_j, else deleted Cq_j

Step 2: create the flow network:

> - create virtual Source(S) and sink(T)
>
> 
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>
> - Use Ford-Fulkerson method count maximal flow M

> **Step 3: calculate the total number of people:**
>
> > The largest number of invaders the Earth will have to deal with is:
> > $Sum = M + Ze + Qe + Pe$