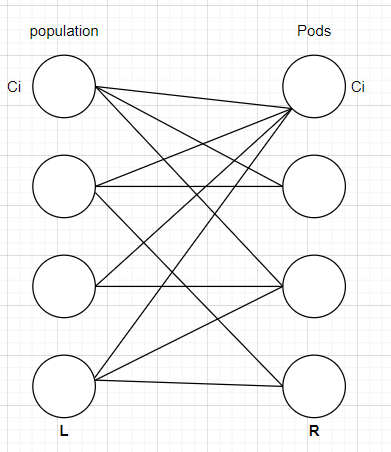
## Question 1

A directed graph could be constructed where is the city of Krypton and is the time cost between two cities. For each city , Using Breadth-first search to obtain the minimum time cost  from city to city .

Then, constructing a bipartite graph which has a set of representing the population of each city and a set of representing the number of pods that each city has. Connecting the two vertexes from respectively only when minimum time cost is less than days. It could be represented by following diagram.



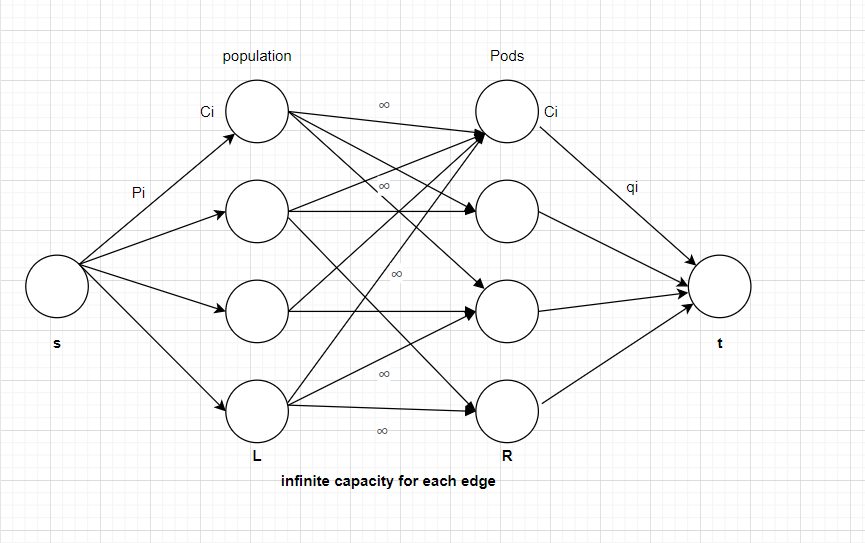
**Example**

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Where set is the set of population of each city and set is the number of pods of each city.

To obtain the largest population that could take the pods to earth, we need to find the maximum matching of . Thus, constructing a network flow that respect to . The capacity of the path from to the vertex in and the path from the vertex in to sink should be the population of the city and the number of pods of each city. It makes sense because source can only “transfer” to where is the population of and each vertex in set could only “transfer” to sink where is the number of pods of .

In addition, the capacity of edge between and should be infinity because there is not such a limitation about the maximum population flow between each city. Therefore, could be represented by following diagram.



**Example**

Finally, applying ***Ford-Fulkerson algorithm*** to obtain the maximum flow of and the number of edge from to is the maximum number of invaders the Earth will have to deal with.