1. We should construct a corresponding bipartite graph. Vertices on left side are the patients in cities. Vertices on right side are available beds in cities. Also, we need a super source at left and a super sink at right.
2. The edges between super source and left nodes are the limitation to patients in cities, which is the number of patients in particular cities. The edges between super sink and right nodes are the limitation to beds in cities, which is the number of available beds in particular cities. The edges between left nodes and right nodes mean Transportation of patients living in a particular city to a hospital in a particular city. Thus, an edge should be constructed only if a city is within K kilometers from another city.
3. The capacities of edges between super source and left nodes are the number of patients in particular cities. The capacities of edges between super sink and right nodes are the number of available beds in particular cities. The capacities between left nodes and right nodes should be infinity, since there is no limitation to number of patients that can be transported.
4. For each edge between two cities, If the flow of the edge between two cities, let’s say city i and city j, is k, not zero, then we should transport k patients from city i to hospital in city j.
5. Compare the max flow of the network to the sum of p(i) for 1<= i <= N. If the max flow is equal to the sum of p(i), all patients has been allocated in a hospital, which means the output is “possible”. Otherwise, the output is “impossible”.