JIE MEI z5173405

Question 1

Construct a flow network as a directed bipartite graph where left hand side vertices represent populations of the corresponding cities and right hand side represent the set of pods in the corresponding cities. Then we will add a super source and a super sink T and connect S with left hand side vertices with edges of populations capacity and connect T with right hand side vertices with edges of pods capacity. Then we need to connect all two vertices on the left-hand side and the right-hand side whose transit time is less than X days and make their capacity infinite. We now run the Edmonds-Karp algorithm to find the maximal flow through that network. The number of such edges determines the largest number of invaders the Earth needed to deal with the total flow from S to T.