Question 3

Applying max flow to solve this problem. Based on the one-direction link of computers, a directed network flow $G(V, E)$ could be constructed where V is the set of vertex that represent the computers and E represented the on-direction link between two computer.
Because only computer 1 send virus and computer N only do receive. Therefore, s is the source and t is the sink which represent computer 1 and computer N respectively. The capacity of each link $c(u, v)$ would be the cost of disconnecting it.

Each link $e \in E$ is associated with a cost. To obtain the minimum cost, the minimum cut is needed. Thus, we use ***Ford-Fulkerson method*** to find the residual network G_f which respect to the maximum flow of network G.
According to the ***max-flow min-cut theorem,*** the value of the maximum flow is equal to some cut (S, T) of network G.
We need to find the minimum cut. Using deep-first search to traverse G_f can store a set of vertexes $u \in S$ could be reached such that the rest of vertexes would be $v \in (V - S) = T$. In such way, we find the min-cut (S, T). Then, the link which has direction $S \to T$ could be removed and the cost would be minimum.