Computer Network Homework 1

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Define the geodesic (short path) distance between two nodes as the minimum number of hops from one node to the other.
Define the diameter of a network as the maximum geodesic distance among all the pairs of two nodes.

1. If the diameter of a network with 100 nodes is 1, what is the minimum number of links in this network?
   Ans: Every node needs to directly connect to the others, so we need: (100)(100-1)/2=100*99/2=4950 links.

2. If the diameter of a network with 100 nodes is 2, what is the minimum number of links in this network?
   Ans: Put a node at the middle and all the others connect to the nodes, so we only need :(100-1)=99 links.

3. For a network of 100 nodes, if the degree of every node is at most 2, what is the minimum diameter of that network?
   Ans: Let all of the nodes be surrounded by a circle, we can get the minimum diameter: 100/2=50 .

4. For a network of 100 nodes, if the degree of every node is at most 3, is it possible that the diameter of this network is not greater than 5?
   Ans: 1+3+6+12+24+48<100. No,impossible.