Social Networks
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How to go Viral on Web
Lecture - 154
Plotting changes in diameter

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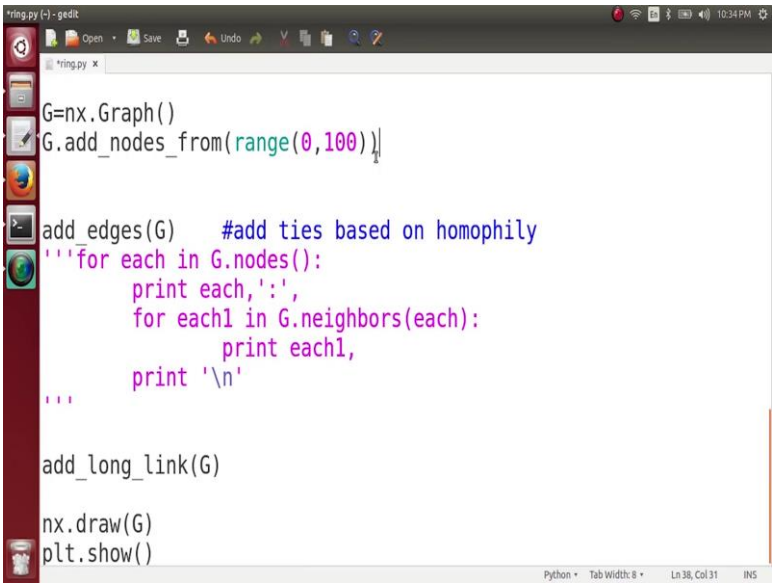

So, what we have done till now is we have created a network having 100 nodes and, on this network, we have created edges based on homophily, that is what we can say is strong ties. Next, we want to look at we have created a function which adds 1, when we call this function once we get 1 long range link in this network. Now, what we want to do is we want to see as we add more and more number of long range ties in this network, how does the diameter of this network reduces.

And, that is easy what we want is on the x axis we want the number of links, number of long range links which have been added to the network and on the y axis we want to plot a diameter of the network. And, please note since we are only adding the edges and initially this network is connected. So, this network is always going to be connected and hence, the diameter will be a positive number which is not infinity ok.

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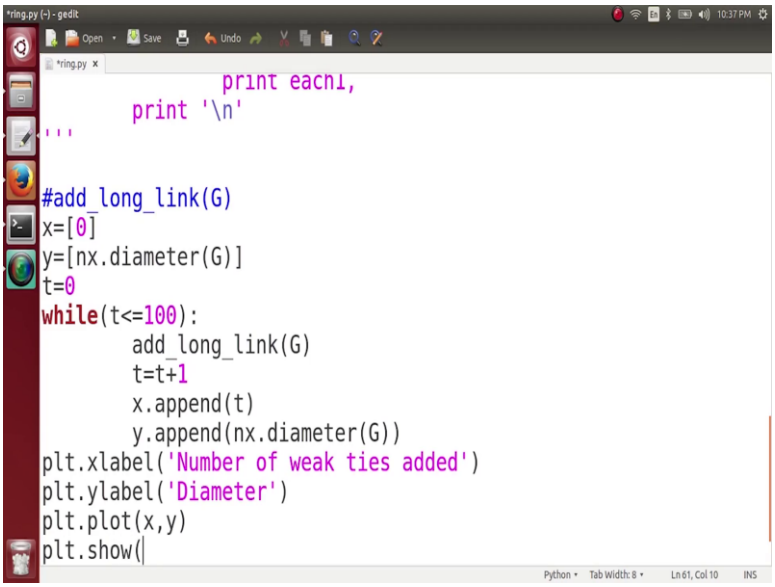

So, what I am going to do now is we need 2 axis 2 let 2 lists; one for the x axis and another for the y axis. So, this is the list for the x axis and we know that the first value for x axis will be 0; x axis shows the number of long range links added. So, when x is 0 that is when there is no long range link added in the network we know that at that time what is the diameter of my network. So, I am going to commend this over here, we have added no long range tie as of now and here the value which will be appended to the y axis is nothing, but the diameter of the network. So, this is the function which tells me the diameter of the graph G.

So, we got 1 1 value for x and y and now we starts from times equals to 0 and at every time step I am going to add 1 long rang link to this network and let say we repeat this process for 100 times. So, when t is less than 100 less than or equals to 100. So, for 100 times since I am going to do this process, what I am going do is I am going to add 1 long link in this network. And, as soon as I add 1 long link in this network what I am going to do is, I am going to increment t by 1. And, then I am going to append t to y sorry t to the list x which means that 1, which means which shows me how many long-range links have been added.

So, at this time when t is 1, 1 long range tie has been added here and simply we know what has to append to the y axis is nothing, but nx.diameter(G). So, we can get here x axis and y axis and we can simply plot them. So, let me set the labels so, plt.xlabel is

nothing, but what we are having on x axis is the number of weak ties added. And, what we are having on y axis is the diameter of the network and then we are simply going to plot plt.plot(x, y) and then plt.show ok.

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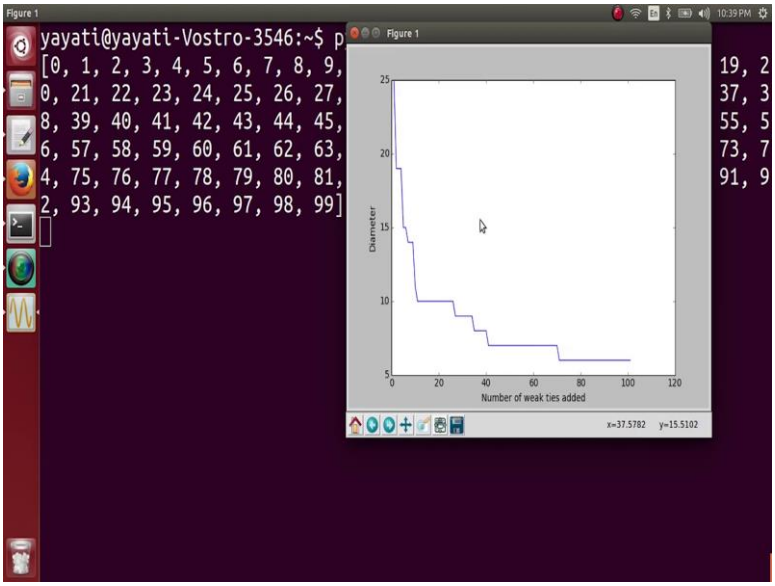

Let execute it and see ok. So, we can see here what is happening the initially you know the diameter of this network was 25. We know it is going to be 25 because, there are 100 nodes and every node is connecting to 2 nodes towards the left and 2 nodes towards the right. So, we can make a jump of 2 in we can make a jump of 2 hopes in 1 hope. So, in 25 jumps we can reach from one end of the network to another and you see that just on the addition of 1; just on the addition of 1 or 2 weak ties the diameter drastically reduces to 18. And, then and we can see that as we add more and more long range ties the diameter reduces drastically, it is not something linear. It reduces very quickly right and then the diameter of the network finally, reaches some 4 or 3 and we have added some 80 weak ties. So, this is how the curve which we wanted to look that looks like.