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Alright guys so in the previous videos we had seen about what is called the directed graphs and few terminologies and we have seen how we can use networkx package to work with directed graph so now in this lecture will get started with what is the points distribution method as the title says what is that actually is? What are we going to do? For this example let us take the same graph the same very simple graph with just three nodes for demonstration purposes while programming may be we take complex network as well. We can do that also will take a simple graph for demonstration purpose just this graph having three nodes will be taking this for demonstration and while programming we van have the complex network as well we can take that as an example. So let's gets started so before starting i would just assume ask you to assume just ask you to assume that this is a network social network as you can say of people liking each other. So you can considered this as probably i have collected a data about your family and friends so this are your family members or friends the nodes are the people and this person likes this person the person A likes the person B in that case will have a directed edge from A to B this is how the network as been constructed. If you by if you would assume this way it would be easier for you if i explain the points distribution method so assume that this is our network a simple network, simple network having just three nodes just assume the network is there is a node between two people if person A likes person B there is a directed edge from person A to B so for demonstration purpose will be taking this simple network containing just three nodes while we are actually programming we can construct a complex network as well having many nodes and edges you can construct any network and you can run your algorithm on in. For demonstration purpose will take a very simple network so just assume that these nodes are people and there is a directed edge from person A to person B if person A likes person B something like that. So will gets started with the points distribution method. So initially all the nodes are given equal points so points you can also consider it as some gift items or gold coins anything some item is given to all the three people something equally has been given and they have been ask to play a sort of a game something like that the rule of this game is whatever you are having you should share it equally with all your out edges so we had collected the data of who all you like right so out edge is who all this A likes person B and person C person B likes just person C, person C just likes person A so this is the data right so you are suppose to share whatever you have to equally to all you like so that is the rule so you have to play the game. So initially they have equal number of points but due to this exchange of the points the next iteration the points may not be equal to all the three, the one thing is guarantee is the sum of points will be the same the initially let us say we have given some x points to each person so three x is the sum right? So the same three x the sum three x would be maintain throughout but the individual values each person is having will differ. So let us see, let us see node A node A has got two neighbours, by neighbours i mean those people to whom there is a outward edge that is person A lies these two people, person B and C so there are these are the neighbours. So given that there are two people you should divided into one by two since there are two people that's why it's one by two if there are three people it will be one by three if there are k people it will be one by k. You should partition your total points into that many fragments and you should be giving it too all those people, that is the rule for node A let us see for node B is

having you should give entirely to node C one by one so it's one so you should give entirely to node C node and node C if you considered he just has one neighbours he just likes one person node A so whatever he is having he should give entirely to node A so i guess do you sense something that we have started with equal points each but even after just one exchange in this passion obeying this rule there is more points will be acquired by node C given that node A will also give something to him node C node B will also give something to him even that two people are giving he will acquire more something like that one node will acquire more one node will acquire less but the sum of the points will be the same that is the if you add up the points with A B and C initially whatever was the sum we started with equal number of points let us say x points to node A node B node C the sum is the addition of all these three values are three x same three x will be maintain after all this iteration like this you have to repeat this process for multiple number of times. So this is how you have to give so now a day's giving to someone as well as getting to someone right so will see the getting details now. So node A will get something so that will be his new points initially if i give a equal number of points let us say hundred number of points for simplicity they were given hundred points each node A hundred node B had hundred and node C has got hundred so three hundred points total in the system so node each node has hundred points initially so following that rule they had to share their points along with their neighbour who the node when have to give it to his neighbours as well as get some points from someone who likes him, for example let's say node B he like node C so he would give his points to node C as well as node A likes node B right so he will also give so node B will be getting something as well so each node will be giving something as well as getting something. So we will see what if gets that's what i mean by new points initially everything was equal following this exchange rule they had exchanged their points and what is the new points. Node A will get everything from node C right so whatever was the old points of C that will entirely come to A that is the new points then for node B he will get half from A because A likes B and C so he has to as per the rule he has to share it equally with both the people right so he will get half of it so do you see that? Initially there was hundred points now even that he is getting just half of it now B will be settled with fifty points after this one exchange. Same like that for node C the new points is he will get half from node A as well as from B entirely he will be getting. So this is how the game has to played game where initially all the nodes were given equal points say hundred points and the points has to be exchanged between the parties following this rule that how many ever outgoing edges you have, how many ever points you have you should share it equally among all the people. So that is the rule following that they should play the game but if you keep playing this game if you keep doing it so after one iteration as i have said we can say iteration one exchanged one round after one round as we had said node A had some hundred points, node B had some fifty points as you could see, node C will be having fifty points if our math you can work out and you will get to know that so this is the status after one exchange. Now with this state there are again following the same rule and node A had hundred points so he will divide into fifty fifty node B had fifty he will give that fifty entirely they follow the same rule and they play this what happens if you play this for say some thousand iterations or ten thousand iterations if you keep doing this what happens? Let us see that in the next part.