Social Networks
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Link Analysis

Lecture – 80
Implementing Page Rank Using Points Distribution Method – 1

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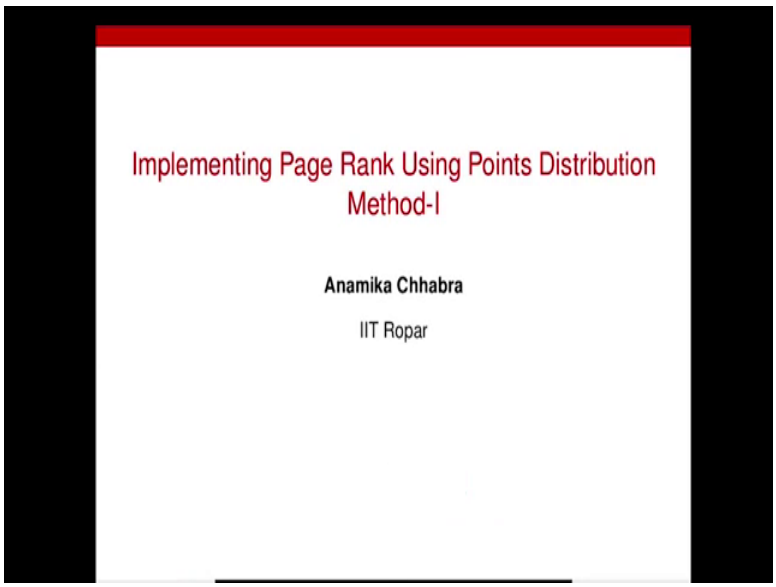

Hey everyone, in this video we are going to implement page rank using points distribution method. I assume, you have been already introduced to this method in the previous videos. So, I will just be briefing out the technique and then we will start the implementation. So, in this method what happens is, we start with the signing of fixed equal number of points to every node in the graph. After that every node distributes its points to its neighbours, by neighbours I mean the nodes that are connected to this node by an out link.

So, basically what we do is we take a node and we look at its out links and the nodes we are connected to this node through an out link get an equal share of points from this node. For example, if there is node which has 100 points and it has 2 out links; so, basically it has 2 neighbours. These 2 neighbours should be getting 50 points each from this node. That is, that is called points distribution in case the node is having 4

neighbours and its having 100 points in that case every neighbour will be getting 25 points each from this node.

Now, that point distribution happens for every node in the graph that is called one iteration. So, every iteration, so, after every iteration the points that every node contains keeps changing. For example, initially if we assign some 100 points to every node and we perform this points distribution after one iteration, the points that every node contains will change. And we keep repeating this process and after every iteration the points will keep changing; however, after some point after some number of iterations what happens? The points do not change, that is even after distributing points the points that the nodes were containing earlier is same as the points that the nodes will be containing after the iteration.

That happens because the number of points that the node distributes is equal to the number points and it gets from the nodes through which it is connected with an in link. So, we basically get a convergence, and as soon as we get the convergence, we stop. And this point every node will be having some number of points after attaining the convergence, every node will be having some points and we can sort the nodes based on that that point distribution. Basically, we can rank the nodes and that ranking is called page rank.

So, that was about the points distribution method. Now let us see the steps that we are going to follow for the implementation.

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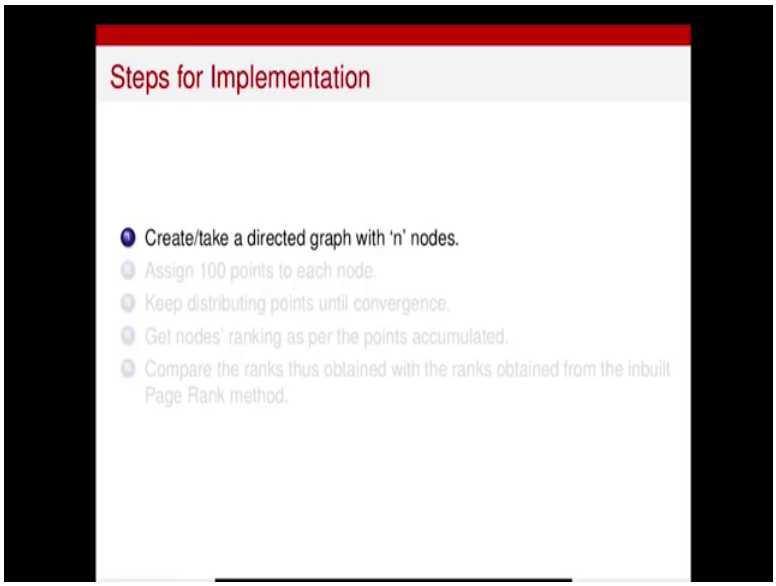

So, as a first step we are going to take a directed graph as you might be knowing for page rank it is better to take a directed graph because the points are distributed based on the out links. So, we are going to create a directed graph, we can also take make use of a function from network x to generate the directed graph, but we will be creating a graph here by ourselves.

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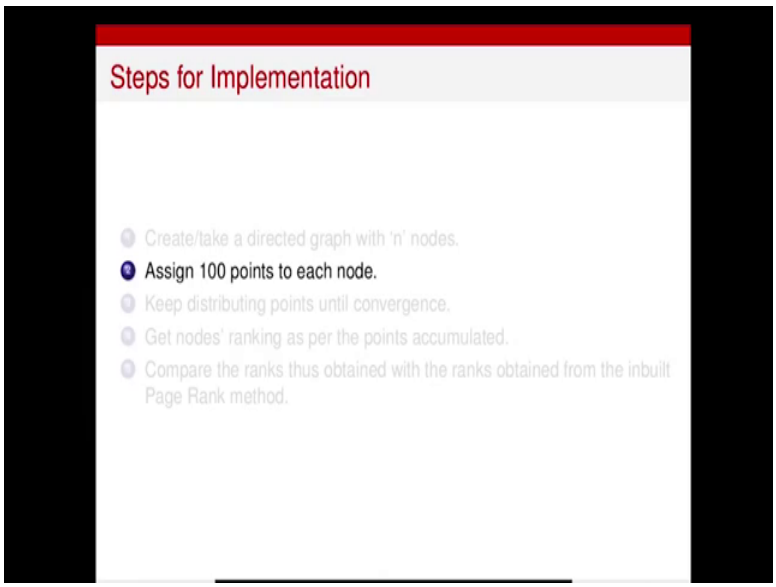

After that we will be assigning 100 points to each node. So, that is the initialisation of the points to every node. As I told you after that every node will distribute the points.

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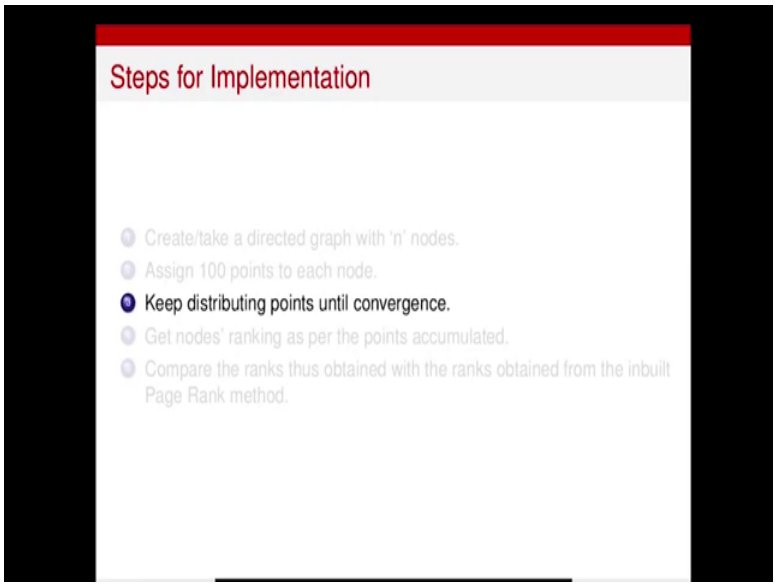

So, as a third step every node will keep distributing its points to its neighbours and this process will keep repeating until, we get a convergence that is, until a point where the nodes points stop changing, that is where we will stop.

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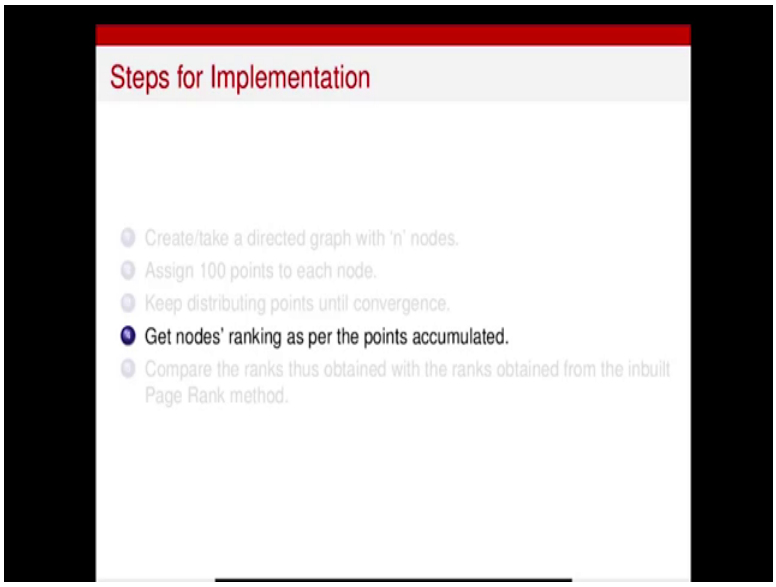

Now, after that we will be getting some distribution of points amongst these nodes and we can rank the nodes based on the points that they have accumulated. That ranking will be called page ranking; page rank basically, in order to validate whether the method is working fine or not.

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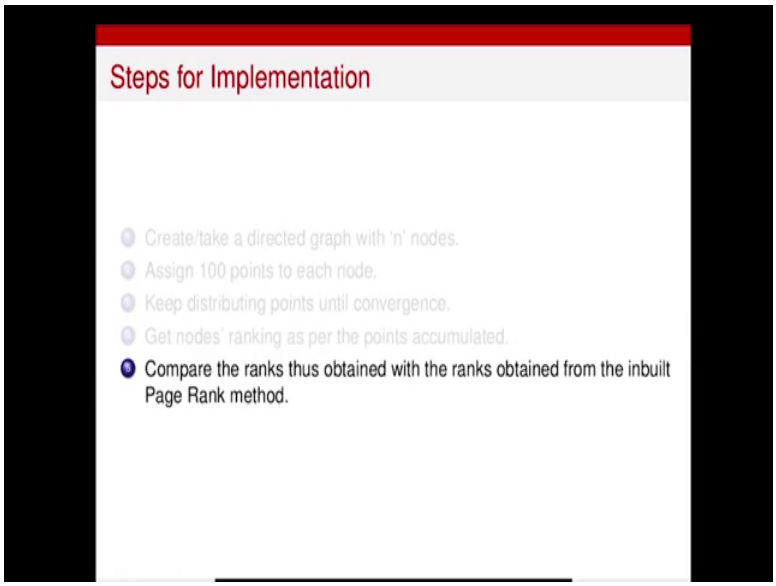

What we will do is as the last step is, we will make use of the inbuilt page rank method from network x and we will see the ranking that we get from that method and we will compare the ranking that we got from our implementation. So, these are the steps that we are going to implement. Let us get started with implementation.