Social Networks
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Link Analysis (Continued)
Lecture - 107
PageRank Revisited - Conservation and Convergence

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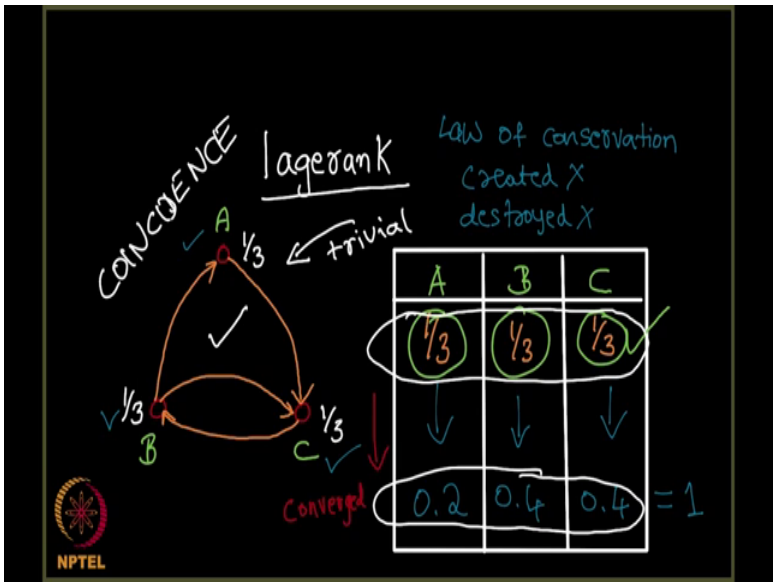

So, let us look at what exactly happened, we took Google sheets and tried seeing what happens as we repeat this process alright. What is the process? Initially you give 1 by 3, 1 by 3 and 1 by 3 to all the notes correct you start with the same values, it is the resources that you have, we have used the example of gold coins if you remember I repeat.

We have used the example of gold coins I am saying resources, from now onwards I will say just an assignment right it is the value that I assigned and every time in every iteration what you do is you the value of let us say A is transferred to C, the value of C is transferred to B the value of B is transferred equally to A and C right we understand this so far so good.

Now when I observed where it converges, we observed that it indeed converges do you remember the values, the values where 0.2, 0.4 and 0.4 you see that the total is equal to 1, why is that? That is very easy to see the resources that you have distributed to these

nodes do not go out anywhere, they just remain in the network itself. This is like the law if you remember let me write this down this is like the law of conservation of energy correct, the law of conservation of energy says energy can neither be created, it cannot be created nor can it be destroyed. What is happening here is exactly analogous to the law of conservation of energy.

The sum total was 1 that is how you started off with right and it remains 1 until the end, but what just happened this process has actually converged that is what you need to understand. How did it converge? I suspect this was a coincidence that it converged. It may not so happen for all the graph, will it happen for any random graph? If I take and then see assign values to it and I will observe that it converges, may not be true.

Let us check for another graph to understand this. In this case the graph, that I considered here look slightly trivial, by trivial I mean what is it just 3 vertices and some 4 edges maybe it looked very symmetric and that is why the convergence happened. Maybe it may not converge, just in case I took some other graph; let us take some other graph and then see whether it converges or not.