Social Networks
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Link Analysis (Continued)
Lecture - 106
PageRank Revisited – Convergence in the Example

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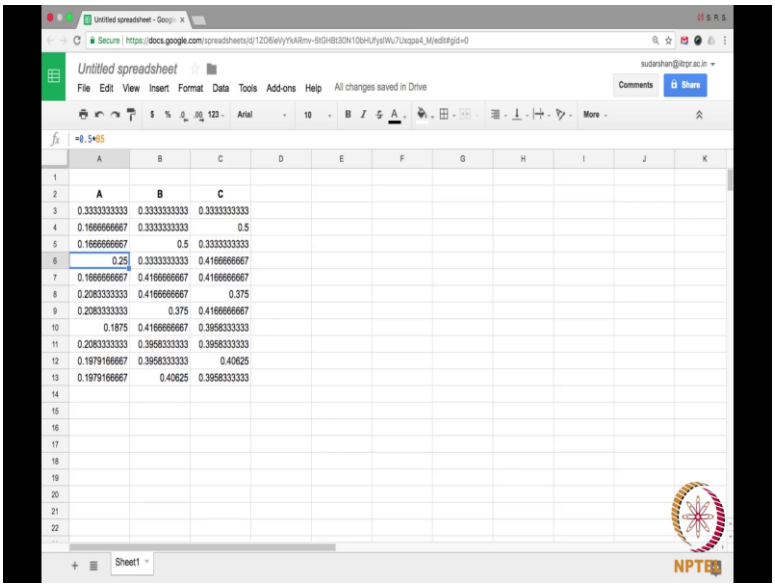

We just now saw graph with three vertices A B and C and now going to use a spreadsheet to see the convergence question that I post in the previous lecture. So, if you recollect A was the node on top, B was the node on the left and C was the node on the right. So, the value of C completely the value of all these three vertices started off with 1/3, 1/3 and 1/3 correct. And the value of C if you remember if you do not, maybe you should watch the previous lecture and make note of the graph there right the value of C completely dependent on the value of A.

So, I will say is equal to A as value which is A 3 that is how that is how you use a spreadsheet. So, I am sort of bored using python interpreter for such easy and trivial things so, I am using spreadsheet. That is one reason one reason is because I find it very easy that is why I am using a spreadsheet, the second reason is that when you want to observe convergence it is very easy to use a excel sheet and then see the convergence, especially when it comes to topic such as this.

So, getting back C's value will be same as A 3 correct C was the bottom right node and the value of B if you remember was simply the value of C right, but then the value of A was half has let me just write this down was equal to what is that this I am sorry B's value was simply the value of C fine. And the value of A was half of the value of B, I write B3; B3 stands for this the column B and then row3. So, 0.5 times B 3 was the value of A, but then the value of C also had 0.5 times the value of B 3 correct.

Please not what I am doing here the formulas are visible here 0.5 times B3, the value of A is half of B3. And then the value of B is exactly the value of C 3 in the previous iteration whatever that was. And the value of C turns out to be the value of A3, if you remember from A it takes everything and half of what B 3 had B had which is this much right.

So, this is perfect so what I do is the facility that a spreadsheet gives is, when I just select this and come down and paste it. It will do the same thing that you did here for the next step. For example, A was equal to 0.5 as you can see A was equal to 0.5 times B3 right this should be 0.5 times B 4 you will observe it will automatically, see look at this it became B 4.

When you copy paste it excel gives you that liberty to automatically repeat the pattern of formula. So, B 5 happens to be C 4 and C 5 as you can see happens to be whatever was in A 4 plus half of whatever was in B 4. The best part now is if you just select these things and then pull this down it will populate the rest of the values. Now, you see the values are changing tremendously of a let us see when you look at A it is so on, so on, so on and you see the sort of values are same here, values are same here, it looks like it is converging right. So, let us look at it, let us continue this formula for more and then see whether it converges.

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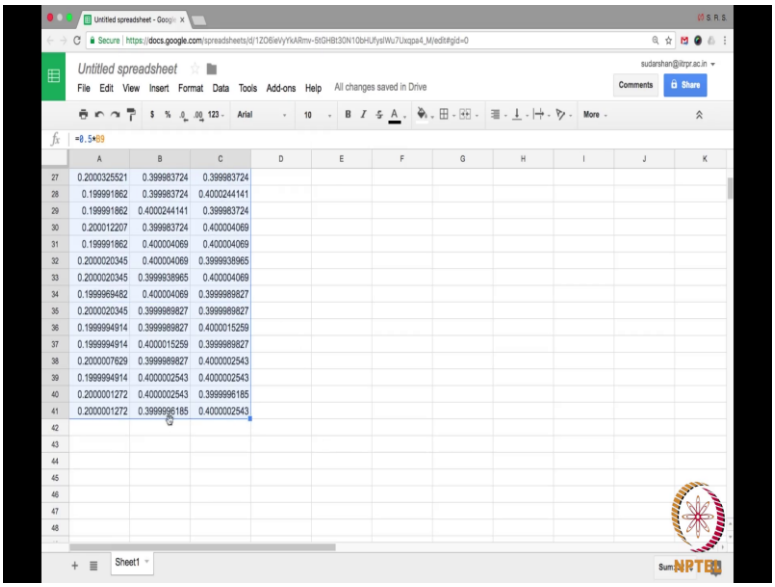

Well, look at this it is almost0.2, 0.39, 0.4 the values are not changing. Let me continue it even further right, its getting more and more sort of refined and even further let me go even further keep going, keep going, please note excel this just Google spreadsheet approximates the values here right.

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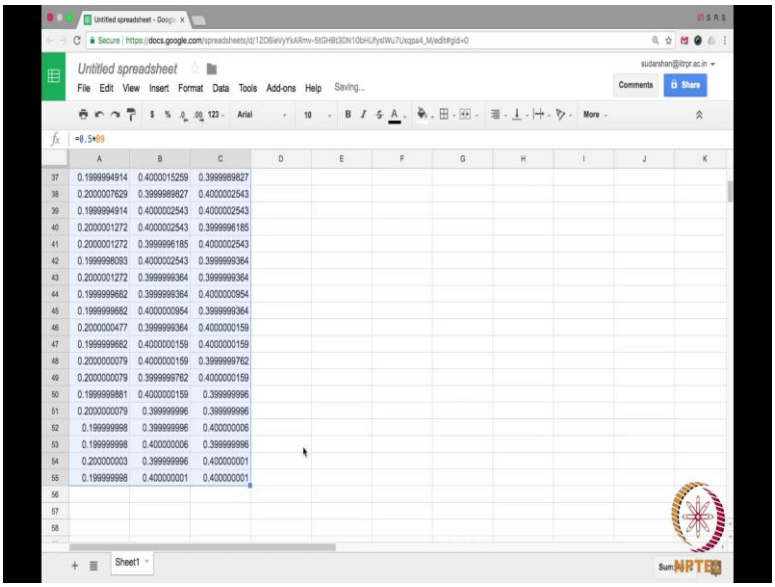

Eventually, let us see what happens not much of a change. You still have 0.2 0.4 0.4 happening, but then you see what is happening here this is very, very, close to 0.2very

close to 0.4,, very close to 0.4 A's I keep continuing it you will be surprised to see that it will converge to the exact value.

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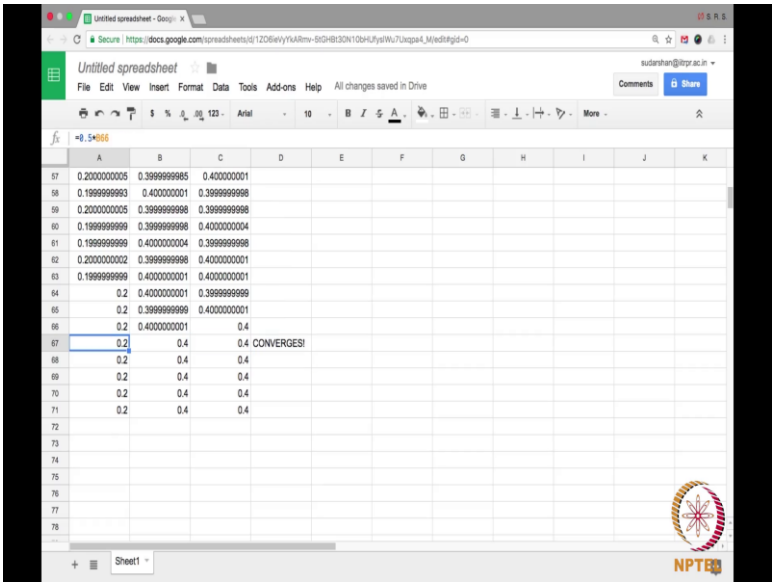

Now look at this hip; hip hooray there is 0.2 here, 0.4 here, and 0.4 here. And this is the place where I would say it converges not just here; here itself right converges that is right. So, what just happened? Let us switch back to the screen cast, in my next lecture and then see what exactly we did here and what did we observe. Please note the values A turned out to be 0.2, B turned out to be 0.4 and C turned out to be 0.4.