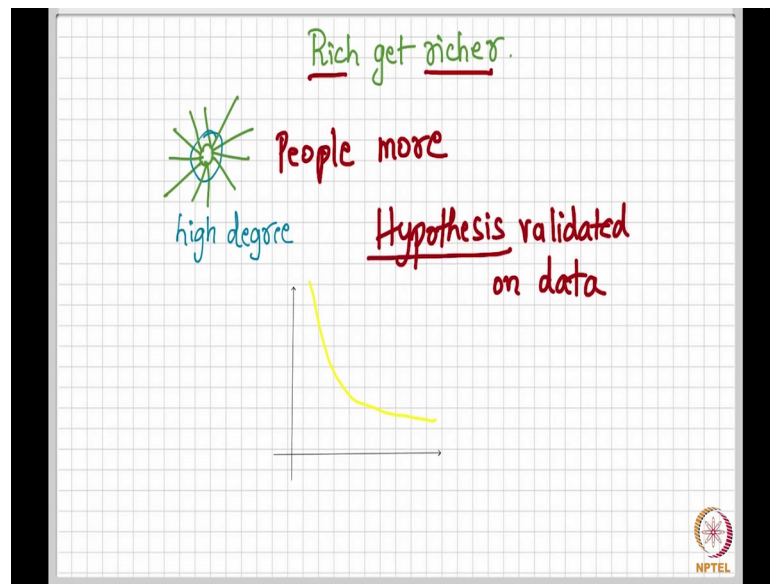


**Social Networks**  
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**Rich Get Richer Phenomenon – 2**  
**Lecture - 126**  
**Rich Get Richer - A Possible Reason**

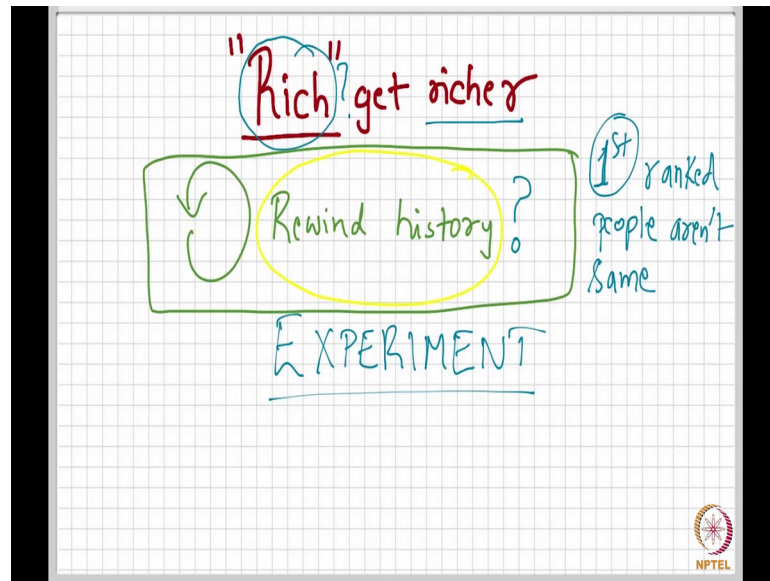
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We saw in the previous lectures, the paradigm called the Rich Get Richer. It was a rich get richer. So, what was happening there? People with high degree they can do attract people more people who have high degree. If they have high degree then they have more propensity to attract more people towards them. So, a person who has more friends will attract more friends more friends. Since, he has more friends he will attract more friends and so on and so forth. This is a sort of a hypothesis, this is a hypothesis validated on several data; validated on data. That does not make this hypothesis true, but it is highly suspected that this phenomena is indeed happening.

What phenomena? The phenomena that the rich get richer because of which we observe the power law happening right, the power law as in the drop in the curve if you remember the drop in the curve correct, fine. So, now, we will try to ask this question; this question slightly unrelated from networks, but related of course, and quite an intriguing question.

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When we say rich get richer right, how did this people become rich in the first place to begin with right? I mean you say that people who have more friends attract more friends. How it they start getting this so called more friends, right?

So, let us take an example. If I were to rewind history, do you think Alice in Wonderland still would be a very popular story ever written? Do you think JK Rowling's Harry Potter would still be a bestseller right? There are many such authors who wrote many novels and stories which did not make it to the best seller status just the way Harry Potter did. If I were to re rewind history that is my question, if I have to rewind it do you think successful people will continue to be successful? Well, how do you even rewind history, how do you even mimic such a experiment, how do we try to sort of re do a stuff and then see if popular people continue to be popular?

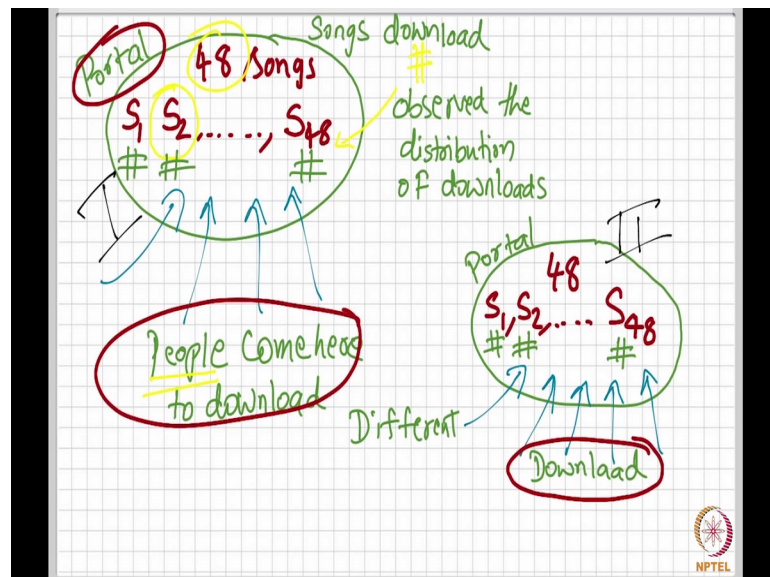
If history where to remind itself and then play once again, do you think Britney Spears would still be the best? Do you think Obama will again become the president of the United States? With this is very tough to answer right. So, probably, one should think of an experiment which sort of gives the tries to attempt an answer to this question. So, what kind of experiment can one do; is my question. What experiment can you think of?

So, I hope my question is clear to you all. The question is people who are rich tend to become richer right. Who are this rich people? Everybody start a fresh with 0 money right. So, who are these people who become famous? JK Rowling before her first work

was not known to people right and she got the people got to know of her through her Harry Potter's work, the philosophers stone which is the part 1 of Harry Potter.

And then she became really famous and whatever she wrote sold. Of course, the work was good too but then still it gave her an edge because she was successful with her first attempt right. So, is this true in general that if you are good you will make it or is it because by luck you make it the first time and you become rich and you become richer because you were rich and so on. There was a nice experiment conducted which I am going to describe right now.

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People took some music songs for download, they took 48 songs ok; song 1, song 2 up to 48 songs. And a bunch of people were asked to come to this portal, this is a portal basically, this is a portal. Let me write that down. This is a portal for songs download, portal for songs for the downloading of the songs ok; songs down download people come here to download songs.

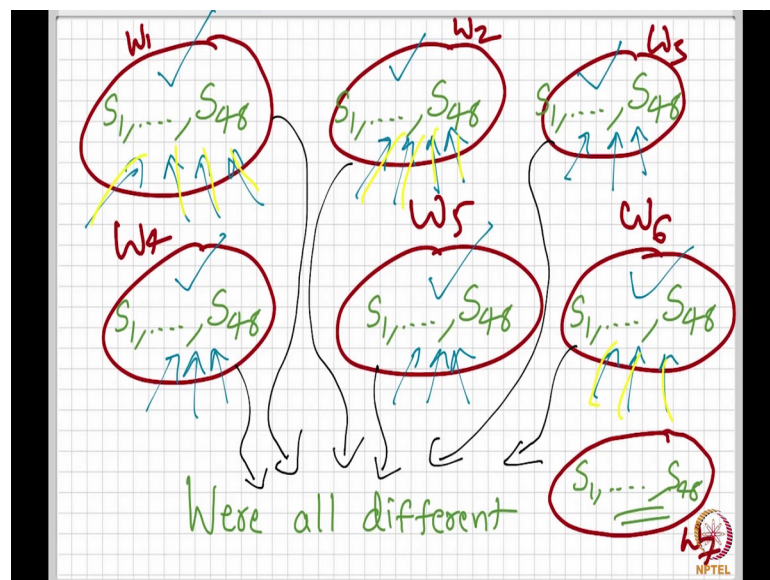
Now, with time people observe that song 2 was being downloaded a whole lot. People do get to see what song is downloaded how many times then the number of downloads is visible and people did see this and eventually it was observed that songs that were downloaded more often became more and more popular ok.

People observed the distribution of downloads, they observed the distribution of downloads. Some of them were really popular and some of them were not very popular ok. Now, here goes our question. If I were to take another world ok, a parallel world as I call it and then take the same 48 songs as I took here and display them for downloading on a different portal. Here was a portal ok, this is a different portal another portal ok. And then again I ask I let some new bunch of people to come here random bunch of people to see and then they download the songs as usual as in the previous case and now I see the distribution of how much how many times songs 1 was downloaded, how many the number of times song 2 was downloaded, the number of times song 48 was download and so on, all the songs.

I have made note of this as well right in the previous case ok. So, now, what do you expect? Let me be clear. The people here are different they are different from people here to download the songs.

This is one world this one is world number 1 this one is world number 2 ok.

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So, if I want to create many such words let us say world 1, world 2, world 3, let say world 4, 5 and 6; I have six different worlds and then all these worlds I have the same bunch of songs; song 1 to song 48 I had 48 songs ok, same thing everywhere alright. So, let me just copy paste and I have the same thing here and then the same thing here in  $w_3$  and  $w_4$  I have the same bunch of songs and assume I have this 5 what is call the parallel

universe, where different bunch of people are allowed to come and download the songs. Here people are different; here people are different and so on.

So, please note this people do not know about other portals. There are six portals and different people assigned to different places. So, people were assigned here are different from people of same here and people were same here and so on. So, it was observed that the distribution; the distribution of  $w_1$  and the distribution of  $w_2$  and that of  $w_3$  and that of  $w_4$  and that of  $w_5$  and that of  $w_6$  were all different.

What do I mean by that? By that I mean winner here the most downloaded song here was different from most downloaded song here was different from what it was here different from here different from here and different from here.

Now, pause for a minute and think what is happening? You have 6 different worlds where different people were assigned the task of downloading music and rating the music and they it was observed that the number of downloads of a song was different in different portals. Now, why is this? What just happened here?

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The reason here is precisely what we were discussing before, the rich getting rich richer phenomenon; rich get richer phenomena. The fact that you displayed the downloading information or let us say rating information right, you displayed the download information the download information not downloading information download

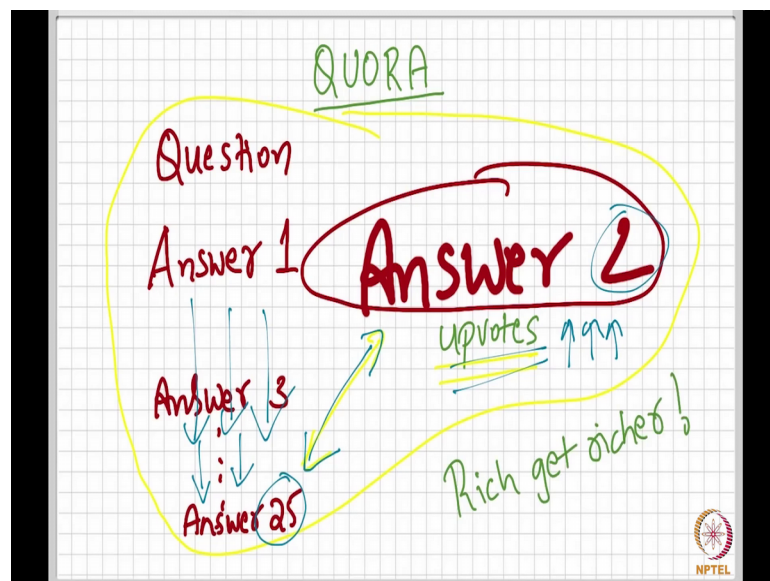
information and people saw that and sort of became biased right. So, highly downloaded songs it was displayed there of course, this are the highly downloaded songs biased new people new people to download these songs and hence they downloaded and that added to the download count once again so on and so forth ok.

So, there was an there was an experiment which involved another world with the same songs where no information of the download was display and yet again the distribution was very different here ok. So, this was the world let say 7th world alright ok. So, what does it signified?

Signifies that the fact that something is good results in that something becoming further good right. Good gets good becomes good even further rather the right world is better. Good gets better and better gets let say more better sounds like a wrong English grammar, but there is there is no other way for [laughing] me to explain this; good gets better, better becomes more better and more better becomes more and more better.

Why? That is because if something is very good. People tend to get attracted to it and they added to the popularity of the stuff right. So, this is called the rich get richer phenomena. This is observed in almost all the places. I will give one instance where you can relate this phenomenon very well and that is your Quora portal.

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If you did not know quora is a portal where people ask questions. There is a question and there is an answer. There is not just an answer; there is an answer 1, answer 2, answer 3 and so on. So, what happens in quora is just in case answer let say answer 2 becomes really really popular ok; answer 2 becomes really really popular; you know what happened then ok? The sort of dominates this question thread, answer 2 becomes popular and it gets more what is called upvotes and more people see answer 2 and they will upvote it all the more.

And just in case a new answer comes, let us say answer 25, which is much better than this answer; nobody at all even if it is much much better than answer 2. Assume answer 25 is way better than answer 2, nobody will see it. It will just be flushed down somewhere because quora displays answers based on upvotes right.

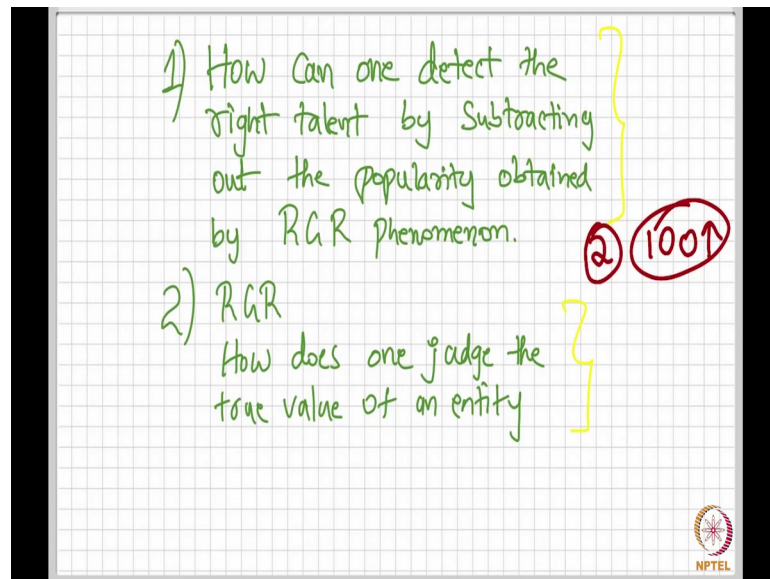
At least so far the main logic behind displaying the answers first is based on the sorted order of their upvotes. So, more the upvotes, more people will see it and more will they upvote the answer and answer becomes popular and no answer that is below answer 2 or lower will ever be displayed. So, do you see the rich get richer phenomena happening here.

Now, one can ask several questions here. So, getting back to a previous question let me go back slide where we were discussing JK Rowling's popularity etcetera. So, if I write to rewind history right, it is most probably true that people the first ranked people are not the same. First rank does not first few rank people. Although people who do really well will continue to do really well, people who do not do well will continue to do if continue not to do very well, but the first rank, but the top few ranks will actually shuffle.

By this I mean, Obama may not become a president if history were to rewind, JK Rowling may not become the bestselling author if history were to rewind and our experiment sort of gives a nice ideas to why the our hypothesis is true that the person who starts of afresh might become rich out of luck to begin with and then rich get richer and he or she becomes richer and richer and richer and attracts more um popularity and becomes all the more richer ok.

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A good and nice question to ask is how do you how can one detect the right talent by subtracting out subtracting out the popularity obtained by this rich getting richer phenomenon. So, how can one do this? This is this is one nice question that one can ask this is one thing.

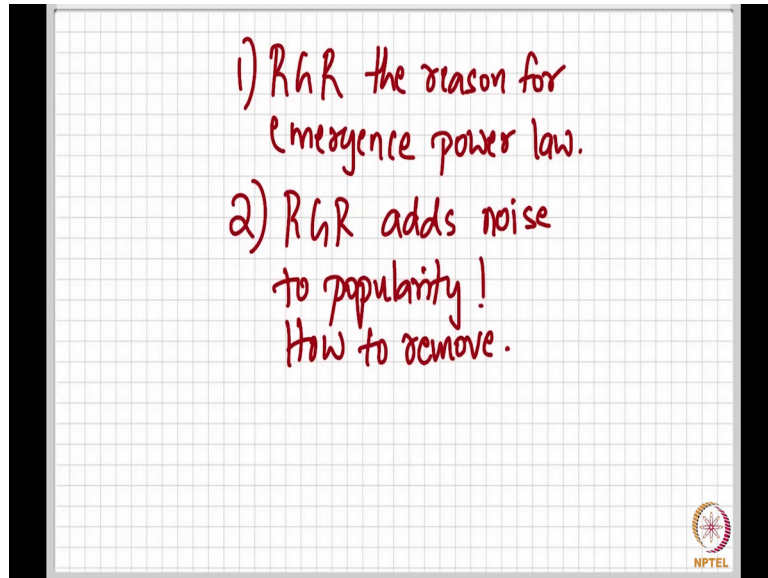
And second thing is if something has had this something has exhibited this rich get rich phenomena how does one judge the true value of an entity which is grown because of rich getting richer phenomena right. So, both sound sort of similar, but there is certain difference between them. The first one being something that is over already how would you know who is the right person by subtracting out the popularity, the second one is you should not just rank them, but you should understand that true value.

For example, in quora upvotes if its the worlds are beyond 100 should you really take it seriously right? A questions answers is beyond 100, but was, but as an answer 2, second answer to the question; one should probably subtract out a few votes here to sort of normalize and to understand the exact popularity of the answer right.

So, it this allows still open questions in the domain where people have not really understood. Firstly, we do not understand if rich get getting richer phenomena is the reason why power law emerges, first one right.

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Is rich getting richer the reason? The reason for the emergence of power law this we have not understood it well it is just to hypothesis. Secondly, rich getting richer phenomena adds noise to popularity. How to remove this noise right? How does one go about removing it, how to remove this noise? So, that the true color, the true picture, the true popularity of a person is revealed.