Decision Support System for Managers
Prof. Anupam Ghosh
Vinod Gupta School of Management
Indian Institute of Technology, Kharagpur

Module – 05
Lecture – 27
Employee Selection, Promotion and Deployment Methods- Lp Method

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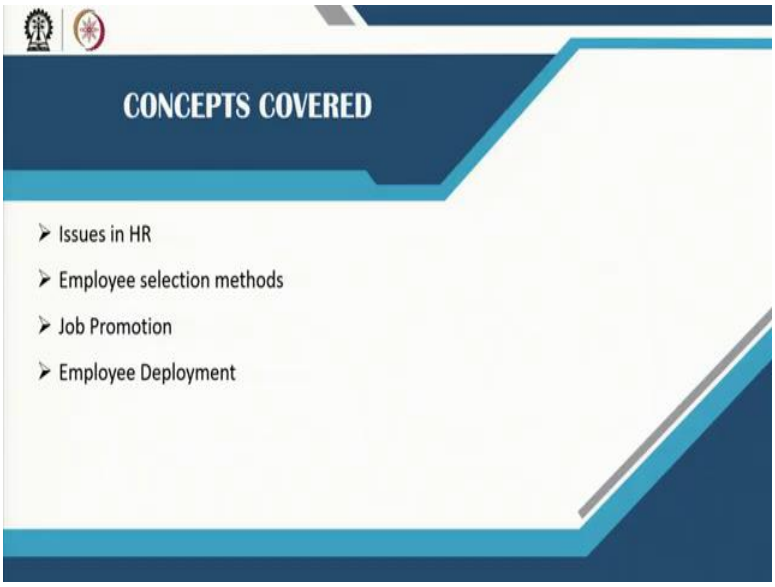

Hello and welcome to "Decision Support Systems for Managers"! We are into module 5, 'decision support systems for HR managers' and lecture 2 of module 5 that is employee selection, promotion and deployment methods that is today, we will do Lp method.

Now, these are the concepts covered in this module ok; issues in HR; employee selection methods; job promotion methods and employee deployment methods; ok.

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Now, issues in HR, we have discussed in the previous lecture.

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Today, we will deal with employee selection methods. Now, let us spend 1 or 2 minutes on what is; employee selection methods ok. See this; employee selection methods normally job interviews, the resumes are selected, then the resumes are shortlisted based on certain criteria.

Now, with systems changes, we are also providing points for each criteria; how much marks you have obtained in your class 10, class 12; if you are obtained 100 percent, you

get 10. If you obtain between 90 and 100, you get 9. So, these different points or weights are given and accordingly, we select ok. Otherwise, there are lots of questions will be asked; ok.

So, today, we will learn some new techniques for employee selection ok. Normally the ones that we follow is simply giving points to the criteria on the basis of an on the basis of which an employee is selected.

Today we will give you some other methods by which you can select employees and we will do Lp method today. Lp does not mean linear programming, it means linear point; ok.

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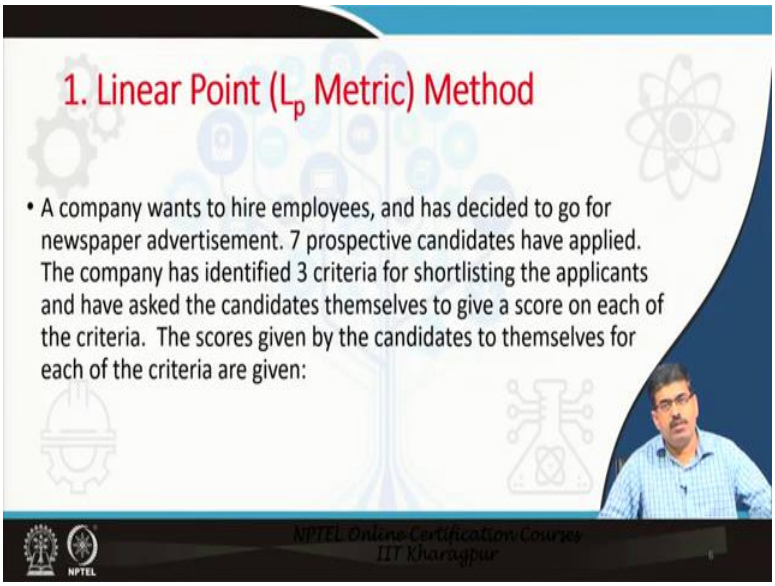

Now, a company wants to hire employees. I am reading it out ok. A company wants to hire employees, and has decided to go for newspaper advertisement. 7 prospective candidates have applied. The company has identified 3 criteria for shortlisting the applicants and have asked the candidates themselves to give a score on each of the criteria.

I am repeating a company wants to hire employees and has decided to go for newspaper advertisement ok. So, you have advertised. 7 candidates have applied. We have we have making it a bit less so that it fits in our screen and all that.

So, 7 candidates have applied. The company has identified 3 criteria for shortlisting the applicants and I have asked the candidates themselves to give a score on each of the criteria and I have asked the candidates themselves to give a score on each of the criteria. The scores given by the candidates to themselves for each of the criteria are given.

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So, this is the table. Now, let us spend 2 minutes on this table. We have candidate 1, 2, 3, 4, 5, 6, 7 and we will name them later on as s 1, s 2, s 3, s 4, s 5, s 6, s 7 ok. Now these information's were asked from the candidate that is days absent in previous job. This is just an example which is giving; ok.

We can have many criteria; on target means you have finished the project on schedule and on target the score is out of 2. So, definitely 2 is better. Number of days taken to complete project worth rupees 100 crore; so , this is the number of days taken.

Again, this these are just arbitrary numbers, do not take it at the face value ok. So, number of days taken to complete project worth rupees 100 crores. So, candidate 1, in the previous job in one year, he was absent for 50 days; he was on target for all his work 0.95; that means, almost 50 percent, almost 47 percent of the times he was on target.

Number of days taken to complete the project worth rupees 100 crore is 105650 is a number; actually we will make it less ok. So, last candidate, candidate 7 in the number of days absent in the previous job, it was 65 days in a year he was absent; on target he was 1.33 times. A number of days taken to complete the project worth rupees 100 crore is 6200.

Now, you will ask me the projects may be different; yes, but here we assume that the projects of similar type; ok. But this is just as I said for demonstration purpose; ok,

nothing I mean sacrosanct. So, you see what we are seeing from this table, just have a look at this table, what you are seeing from this table, let us see. We are noticing that each one is good in something, than the other not good in something ok. So, these types of things are there, good in something; not good at something.

So, you it is bit difficult to come up with a conclusion on basically what to do, which candidate to choose and assume there is no interview, it is only the data and all these data that they have given is backed by basically you are shortlisting them right now ok. Then, they might be called for interview ok. So, you are shortlisting them. So, each of this information that the candidates have furnished is backed by documents; ok.

So, given this, what will you do? You see different, different things; one, this one is good, other that one is bad. If you see candidate 5, number of days absent is 40 only, very good; but on target is 1.17. But the best candidate on target is candidate 6, but his days absent is 60 ok. So, lot of this conflicting things are there. So, we will have to be very careful on arriving at a solution; ok.

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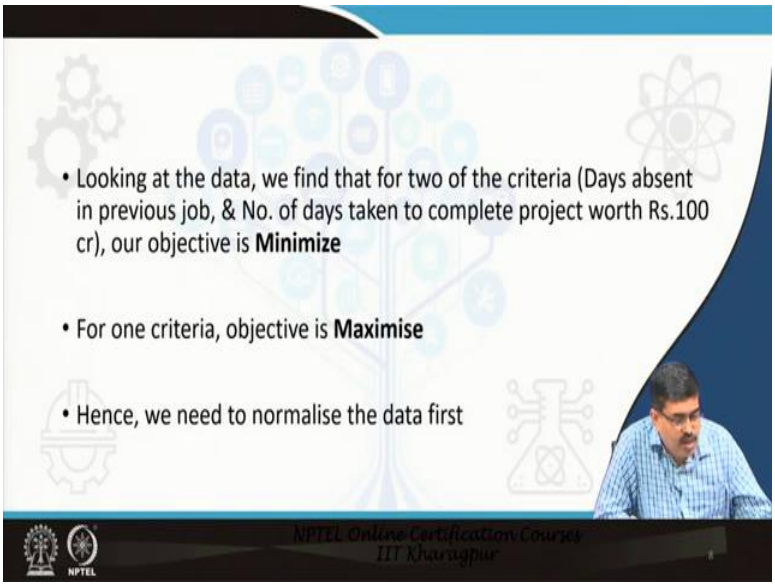

Now so, how to do it? Looking at the data we find that for two of the criteria; days absent in previous job and number of days taken to complete project worth rupees 100 crore. Our objective is minimize. Let us see what it means.

Yeah, see days absent in previous job as a HR person, do you want a candidate who is absent very much or less absent? You want less absent right. A candidate who is more absent, you do not want him or her; less absent, you want. So, days absent in previous job; your objective is what? Your objective is to minimize right; so, min right. Your objective is to minimize; so, days absent previous job, min; ok.

On target, what is your objective? Your objective is to maximize right; your objective is to maximize because you want on target. Number of days taken to complete project worth rupees 100 crore ok; number of days taken to complete project worth rupees 100 crore; again, what is your objective? Minimization right; you want to minimize the number of days taken to complete right. So, days absent in previous job, minimize; on target, maximize; a number of days taken to complete projects, minimize; ok.

So, you see three conflicting objectives; are the two min max and min; ok. So, how to proceed ok? This is what we have already mentioned. Looking at the data, we find that for two of the criteria, objective is minimized; for one, it is maximized. Hence, we need to normalize the data first. Let us bring all of them to a common platform.

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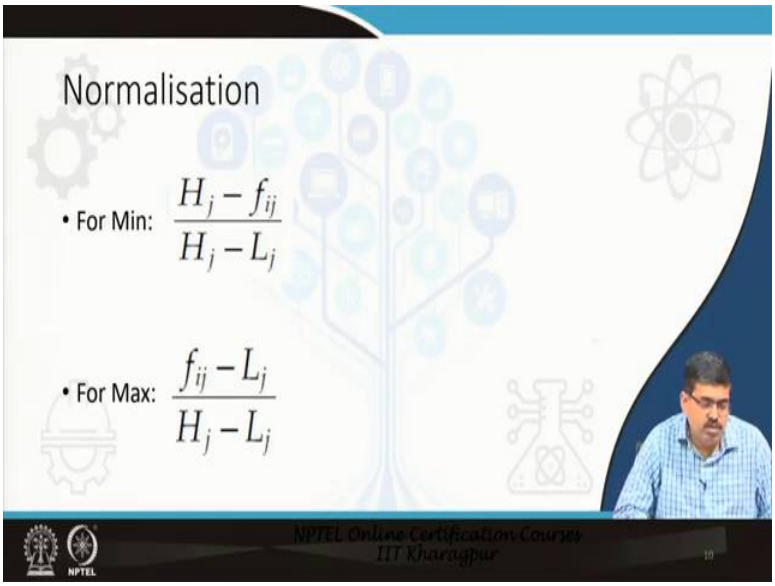

Formulas to be used for normalization for min H j minus f ij divided by R j ok. What is this R j? is that is highest minus lowest. Now, I will explain this. For max, f ij minus L j by H j minus L j ok. What are this basically I will explain. H j is the highest value in that particular column, f ij is the value at that particular cell ok; H j highest value in that column f ij is the value at that particular cell and H j minus L j is basically the range that is the range of that series.

So, so, let us go back and see what this is. Let us take days absent in previous job ok; days absent. What is the criteria? We have to minimize right. What is the minimization formula? H j minus f ij divided by H j minus L j. So, you have got three terms; H, f and L ok. So, what is H j? Highest value in that column. So, let us look at this column, days absent in previous job; what is the highest value in that column 80. What is L j? L j is the lowest value in that column that is 40; right.

So, go back to the formula once again, H j minus L j in denominator. So, what is the value 80 minus 40. So, 40 is the value of the denominator and H top let us say the numerator H j minus f ij ok. Go back to this candidate 1, f ij is the; candidate 1 f ij is the value at that cell. So, what is the value at that cell? 50; 5 0. So, H ij minus f ij will be H ij was what? Highest value right. H j that is 80 minus f ij; f ij means the value at that cell. So, 80 minus 50, it is 30; ok.

So, what does the minimization formula look like now? H ij minus sorry H j minus f ij that is h is 80 f ij is 50. So, 80 minus 50 is 30 divided by H j minus L j which is 80, minus 40, 40. So, 30 by 40 that is equal to 3 by 4, that is equal to 0.75 ok. This is for the first cell; so, 0.75.

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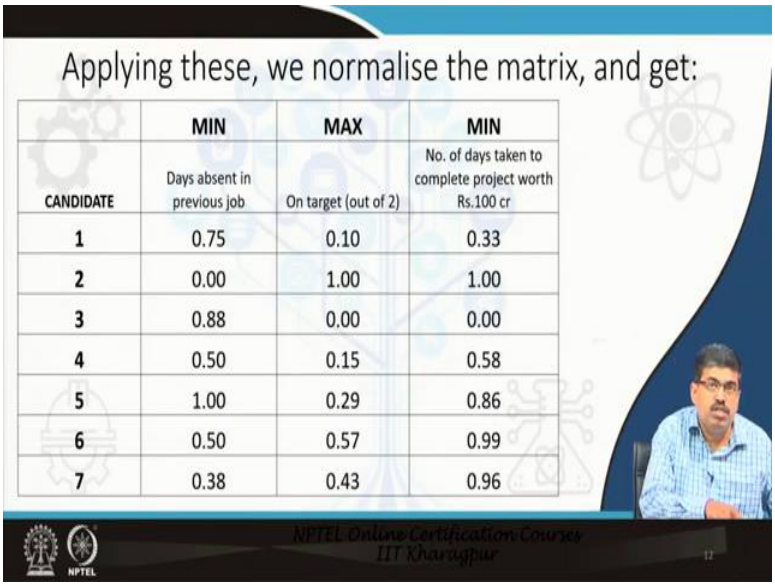

So, see this column candidate 1 is 0.75 ok, For the next one 80 ok. So, 80 highest value is again 80, next cell candidate 2 that is row 2 ok. The highest value is 80 right, highest value is 80. What is the cell value?

Cell value is also 80. So, 80 minus 80 is 0. And what is the range, bottom H j minus L j 40 right; 80 minus 40 that is 40. So, 80 minus 80 that is 0 H j minus f ij 80 minus 80 is 40 sorry 0; 0 by 40 is 0. So, let us see candidate 2 0.00. So, in this way we will normalize ok. We will normalize this entire table; ok. Clear?

Let us take the second one, the criteria maximize ok. Yeah on target out of 2, 0.95. What is the maximize formula? f ij minus L j by range ok. f ij minus L j that is the next one f ij minus L j divided by H j minus L j yeah. So, let us create table. The same table same table ok. candidate 1 column 2 on target f ij is what? 0.95 minus L j?

L j is what? The lowest value. Lowest value is what? 0.83. So, 0.95 minus 0.83 divided by what is the range? Range is 1.33 minus 0.83 ok. Highest value minus lowest value; 1.33 minus 0.83; ok.

So, that value will come to 0.10 ok. So, in this way, you prepare this entire table. This is called as the normalized matrix.

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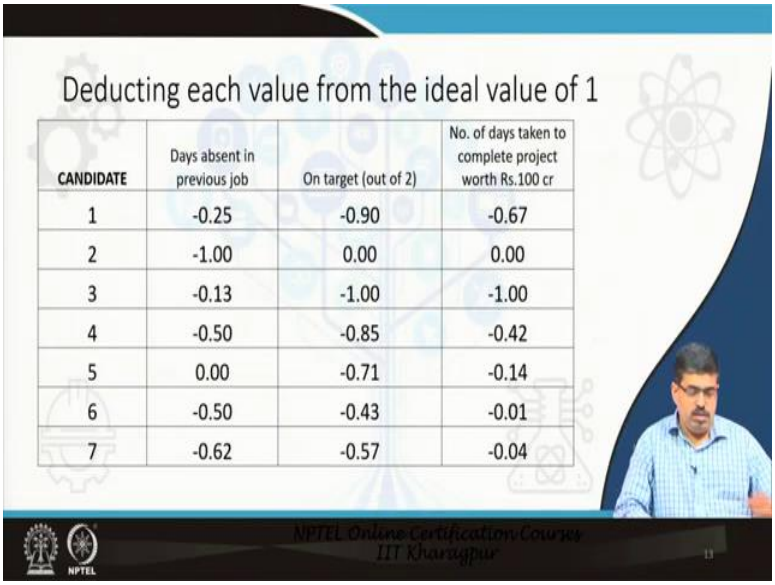

um Now, deducting each value; actually this is a bit reverse, deducting one from each value, deducting one from each value. So, basically 0.75 minus 1 is minus 0.25. Now, what is this 1? Deducting one from each value; what is this 1? This 1 is the ideal value ok, this 1 is the ideal value that you will have to remember. So, deducting one from each value, we get this table.

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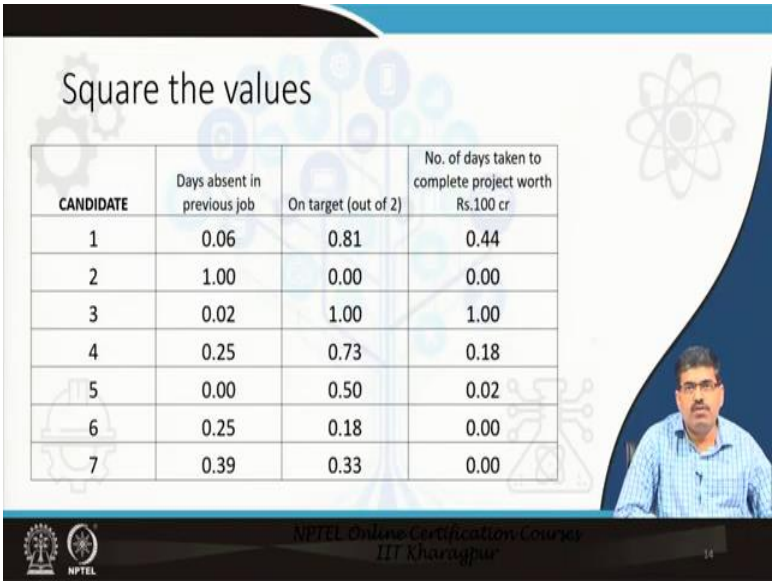

Square the values, fine; we have squared the values. Just a second, we have squared the values; ok.

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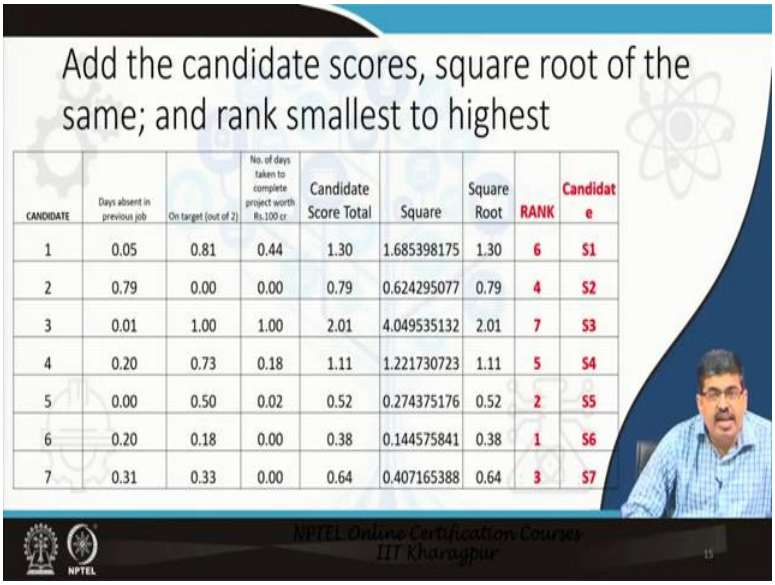

CANDIDATE	Days absent in previous job	On target (out of 2)	No. of days taken to complete project worth Rs.100 cr	Candidate Score Total	Square	Square Root	RANK	Candidate
1	0.05	0.81	0.44	1.30	1.685398175	1.30	6	S1
2	0.79	0.00	0.00	0.79	0.624295077	0.79	4	S2
3	0.01	1.00	1.00	2.01	4.049535132	2.01	7	S3
4	0.20	0.73	0.18	1.11	1.221730723	1.11	5	S4
5	0.00	0.50	0.02	0.52	0.274375176	0.52	2	S5
6	0.20	0.18	0.00	0.38	0.144575841	0.38	1	S6
7	0.31	0.33	0.00	0.64	0.407165388	0.64	3	S7

And then, add the candidate scores. After you have squared the values, add the candidate scores that is 0.05, 0.81, 0.44. Add this score, you get 1.3 ok; square them, 1.3 square. Then, square root that is 1.30 ok. So, what do we do? Add the candidate scores square them and then, do a square root. Now, once you have done this, this square root, you arrange them in descending order that is smallest to sorry yeah sorry in ascending order, that is smallest to highest; ok.

Now, why smallest to highest? You see rank smallest to highest. Why smallest to highest? You see what is happening here is that what are you measuring, actually when you are squaring a square root, you are measuring the Euclidean distance. Euclidean distance, your ideal value is 1 ok; your ideal value is 1.

When your ideal value is 1; this one, how far you are from the ideal value; how far you are from the ideal value? The closer you are to the ideal value that is better. So, the lowest score is better; 1 is the ideal value. So, the closer you are to 1, it is better.

So, the lowest score that is the lowest difference between 1 and this point the difference between the distance between 1 and this point, the lowest distance is the best score and we have just calculated the distance using the Euclidean formula ok; square and square

root formula. The lowest distance is the ideal score. So, square root. So, rank the lowest one will be the ideal score. I repeat why is it ideal score. The lowest one because your ideal score is your ideal score is 1 and you are measuring how far you are from 1. So, the one which is closest to 1, that is best; ok.

So that means, what? The distance minimum, the minimum one with the minimum distance that is that is the best. So here, the minimum distance in the square root column you check up, last third from the last square root column, the minimal distance one is basically 0.38, that is the plus that is the employee 6 and here, candidate 6; at the last column, you will see candidate s 6 ok. So, this candidate is rank number 1.

The next one is 0.52, the next immediately closed, this distance zero point is candidate number 2, third one is candidate number 7 ok; so, 0.64. So, the first candidate is s 6, second candidate is x s 5, third candidate is s 7. So, in this order. Now, what is the benefit of this method? The benefit of this method is you have brought out.

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So, this is the rank of the candidates ok. Rank 1, 2, 3, 4 is candidate 6, 5, 7 and 2. Now, what is the benefit of this method? The benefit of this method is you have brought the entire information under one umbrella, given it a mathematical meaning and you have taken a logical decision based on that mathematical meaning.

So, no one can question you tomorrow, as to why this is happened? There was some impropriety, there was some nepotism; no one can tell all these things to you; ok.

Candidates have given them some score, there are documents available to verify them and you have done some method to select these candidates; only thing is these three criteria that we have mentioned; let us say days absent in previous job, on target, number of days taken to complete a project, these three criteria here, we are giving equal weightage ok. But some organizations may give more weightage to some criteria ok. So, that we will do in the next lecture; ok. So, but that that part is separate; but the basic methodology will remain same, basic methodology will remain same.

So, you square the values and so, these three criteria, we have taken for this. Now, if you have more candidates, just increase the number of columns; if you have more criteria, just increase the number of rows, nothing else. But the basic calculation methodology will remain the same.

Here we took three criteria, calculation methodology we used was Lp norm ok. Clear? So, this is one method for employee selection, other methods for employee selection will be rating further and we will proceed.

Now, these methods are also called as multi criteria decision making methods ok. Clear? Where there are so many criteria and you will have to take decision based on optimizing of this criteria ok. Clear? So, the so we deal with lot of assigning weights etcetera, for selection of candidates. Here through this method, we learned one more way of selecting candidates ok. This will cater to your semi structured way of doing interviews ok, for selection of candidates because you see the criteria are a bit different; ok.

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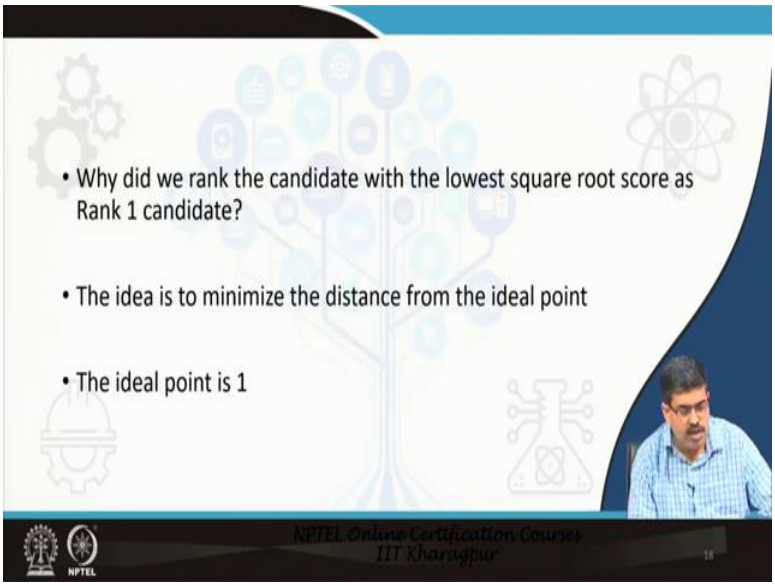

Sorry; yeah, that slide is not here. Now, why yeah as I have explained, why did we rank the candidate with lowest square root as rank one candidate? The idea is to minimize the distance from the ideal point; the ideal point is 1 ok. Now, this is a small typographic error. I will just calculate; this slide has to be deleted. Yeah, we have already this one right; yeah, the ideal point is 1 ok. Clear? Now, the other two methods, we will discuss in the next lecture; ok. Clear!

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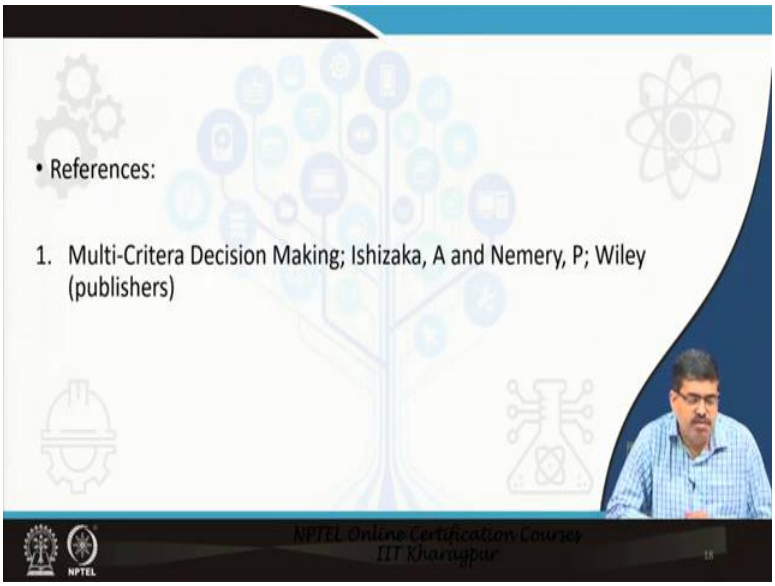

This are the references. Now, this book, I do not; the Wiley is the publishers; Multi-Criteria Decision Making, Ishizaka, A and Nemery, P. This has some of these methods. Remember these methods are not sacrosanct on in.

In the sense that it is only applicable to HR, any decision-making problem where there are too many criteria to choose from which we call as multi-criteria, any such decision-making problem, some multi-criteria decision making problems, this book will be very good; ok. Clear!

So, thank you for today! We will take on with next lecture in the next class.