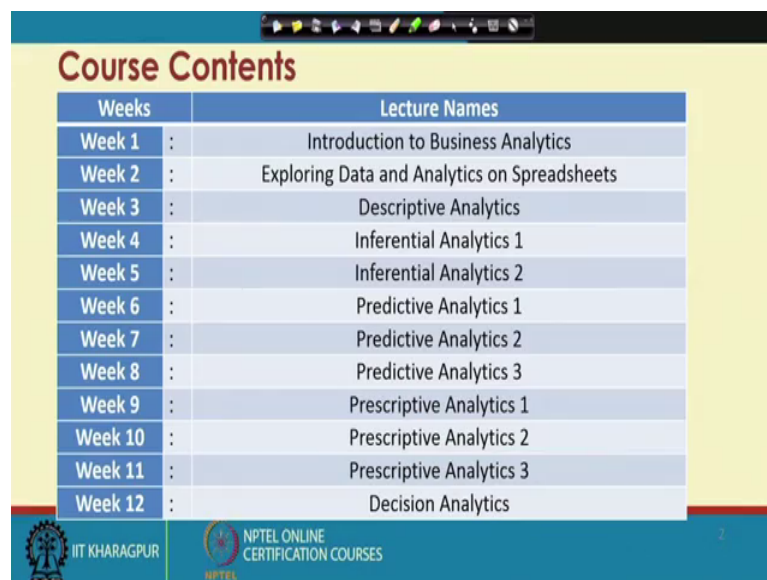**Business Analytics for Management Decision**
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Lecture - 06
Exploring Data and Analytics on Spreadsheets

Hello everybody, this is Rudra Pradhan here, and welcome you to BMDA course, we are here to discuss the second unit lecture that is on Exploring Data and Analytics on Spreadsheets. So, let me briefly introduce what we have discussed in the last lectures.
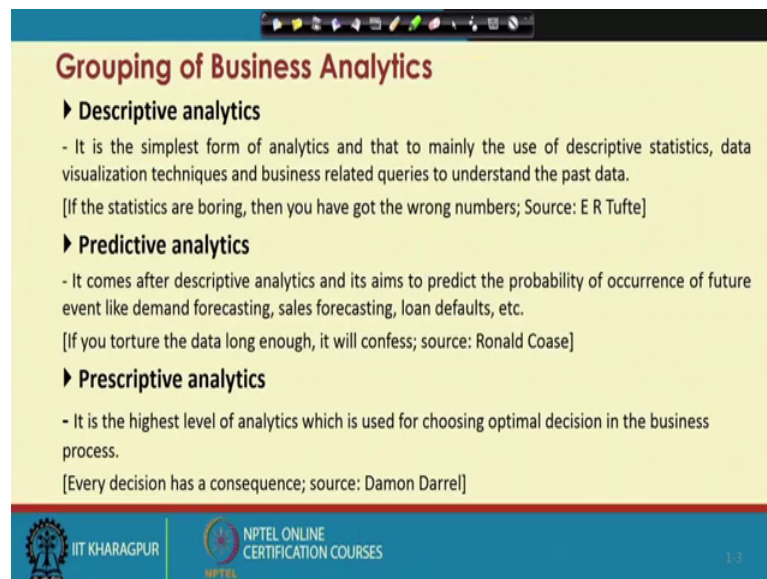
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That is on introduction to business analytics, we highlighted what is the exact concept of business analytics and we have connected with the various applications, the importance, this curve the areas where we can actually apply and some of the business analytics tools basics. And then we are here to know something more about the business analytics kind of structure.

So, in the business analytics there are three things. So, you must have problems and then we must have data, then business analytics tools help you to solve the business problem with the available data and the kind of requirement. Now, once you have a problem. So, then the problem can be transferred into a particular structures, may be in a kind of mathematical model or statistical model, then with the help of data and the kind of analytical tools.

So, we can investigate in a much better way and then we can get much better insights or better kind of inference, to solve some of the business problems and that to true would that to get a kind of better or good management decision. So, here, the first hand requirement is to understand the data and once you understand the data then you may be in a position to apply a particular technique, then to solve this management problems.
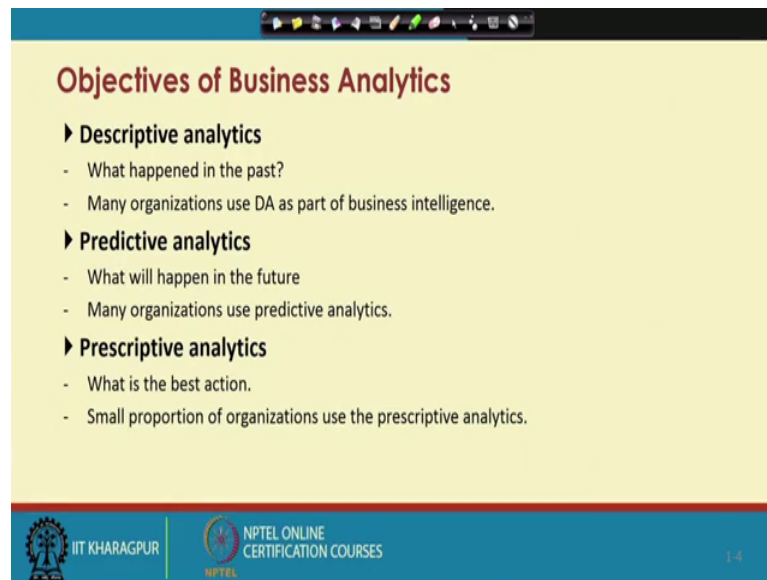
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So, let me highlight here the basics about the particular requirement, in the last lectures we have discussed about the groupings of business analytics. That is descriptive analytics, prescriptive analytics and prescriptive analytics. The descriptive analytics is the simplest one and that to use of simply descriptive statistic data visualization technique and business related queries to understand a past structure. And predictive analytics comes after the descriptive analytics and here the idea is a to predict the probability of occurrence of future event like demand forecasting, sales forecasting's and some other areas like a l loan defaults stock market predictions, etcetera, etcetera, right.

So, in the case of prescriptive analytics, the idea is it just to choose the optimum values of the decision variables. However, these three analytics are very closely connected to each others. So, far as business requirement is the concerned or business decision is a concerned. So, let me give you some kind of hint here.
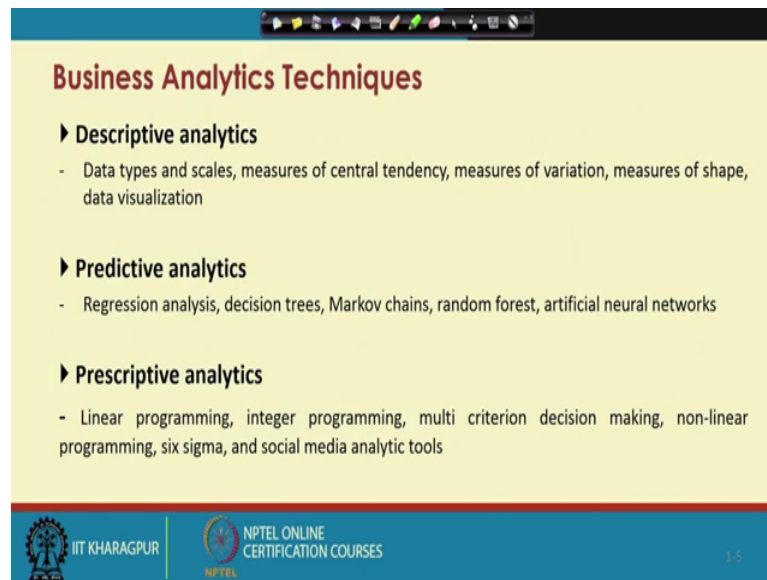
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So, of course, we have highlighted the details in the last lecture. So, the specific questions we like to address in these three analytics are like this. So, in the first case descriptive analytics the idea is to just check, what happened in the past and in the case of relative analytics? So, our idea is just to check what will happen in the future, and prescriptive analytics is the kind of choosing the best courses of action.

So, far as a application or the use of business analytics is concerned. So, most of the organizations they use descriptive analytics as a business intelligence tool, but in the case of predictive analytics only selective organization they use for their business intelligence, and again suppose a prescriptive analytics is concerned very very few organization they use their business intelligence requirement. But what is the reality or what is the best requirement you should analyze the problem in all these three angles.

If you analyze the problem in all the three angles, then it will give you better structure or it will give better decision, so far as your management problem is concerned.

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So, now if you go to the tool basket, then we have actually plenty of tools under the descriptive analytics, we have a plenty of tools in predictive analytics, and we have a plenty of tools in prescriptive analytics.

So, in the descriptive analytics, we have actually the structure called as data types and scales and then measures of central tendency, measures of variation, measures of safe and data visualization. In the case of predictive analytics we are keen to in discuss regression analysis decision tree, Markov chains, random forests and artificial neural networks and in the case of prescriptive analytics we like to highlight linear programming, integer programming, multi criteria decision making, non-linear programming, six sigma and social media analytics tools.

So, we just highlighted a couple of you not take tools or techniques under these three category, but in reality there are many more such techniques are readily available to solve some of the business problem and either in a predictive analytics or prescriptive analytics or any kind of descriptive structures. But here we are going to discuss actually something the kind of requirement for you non descriptive analytics, predictive analytics, and prescriptive analytics. So, that is what actually the structure are for unit 2.

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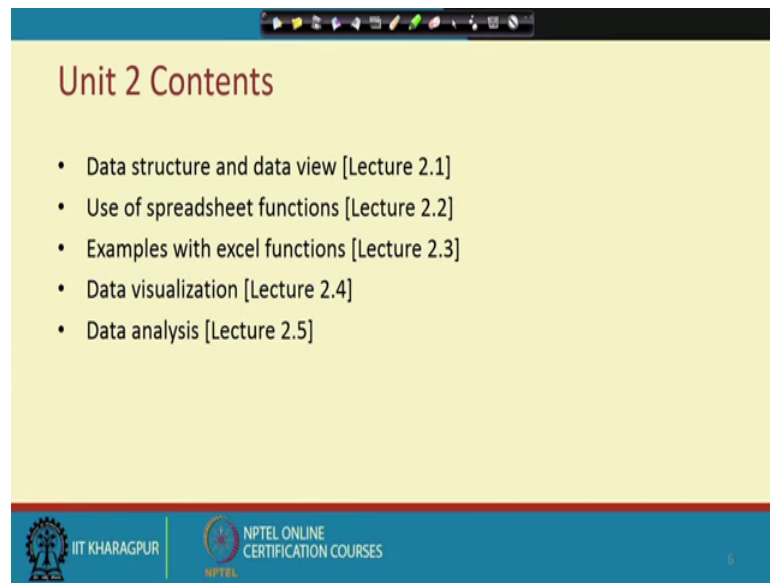
So, in the unit 2, we are going to address type things. So, accordingly we have a 5 different lectures. So, the first lecture will be on data structure and data view.

Then second one is the use of spreadsheet functions then third one is your examples with excel functions fourth one is the data visualization then data analysis and these are the things are mandatory requirement or we can say that it is a precondition to descriptive analytics, predictive analytics and prescriptive analytics, because we need three things we need actually a problem data followed by business analytic tools and then we will look for decision.

So, now until and unless you understand the data properly, then you are not in a position to pick up a particularly you know tool for solving the business problem. So, first of all you understand the data, record the data properly, report the data properly and you do that kind of transformation and structure as per the particular requirement. Because the first hand data may not be in a particular structure as per your requirement.

So, it is you to you know do the kind of transformation or you know structuring so that data can be further use for the problem requirement. So, we are here to address the first one that two data structure and data view through excel spreadsheet.

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So, in these particular lectures we like to understand the data in the first instance, then the use of Microsoft excel. Excel demos then do some kind of excel operations.

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But in the first end, before you go to excel, you should understand the data structure first. So, we have already highlighted data structure can be of four types; a time series cross sectional pool and penner, but in this case. Since we are in dealing with excel operations or excel understanding. So, I am just reporting here they are these two structure only. So, that is time series reporting and cross sectional reporting.

By the way in that in a kind of data understanding so you must specify the variable first and any information related to variable is nothing but called as you know data. So, the information related to the particular variable can be reported with respect to time or it can be reported with respect to any cross sectional unit. When you are reporting with respect to time then cross sectional unit will be constant, and when you are reporting for any cross sectional unit let us say for individual or organization or industry like that. So, then time will be remain fixed right a particular time will be remain fixed and the reporting will be with respect to industry or you know individuals.
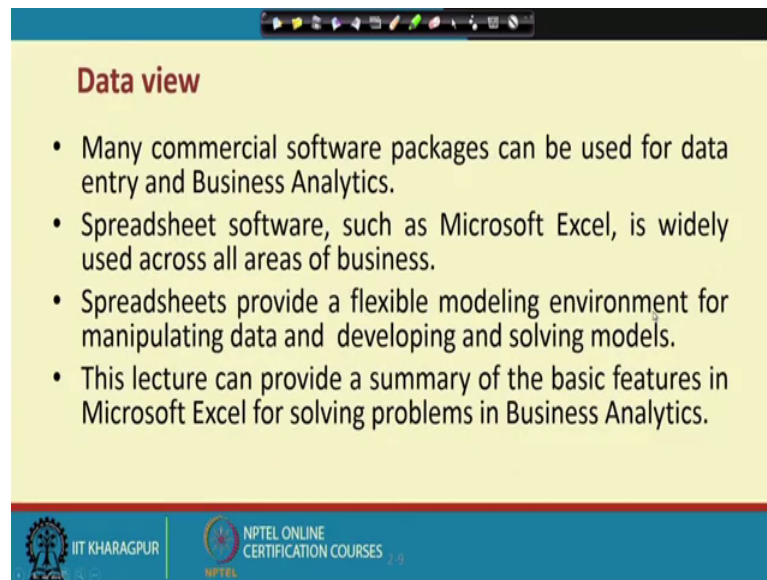
For example, let us say profit is a variables and for a company x and the profit is reporting for 2 different year 2016 and 2017 then 10, 20 respectively in million us dollar then this particular structuring is called as a time series data. So, in the second case the same profit, but it is for a particular company in the year you know you know particularly company means particularly group of company, with in a particular year 2016.

So, now if we like to target a particular industry let us say software, and what is the profit varies on terms in 2016, and here we have just given two examples. So, one is a company ABC and company PQR and that to profit for 2006 2016 is it 10 years ten million US dollar and 20 million US dollar this same data I am putting in a different kind of way.

So, in the first hand it is called as you know this is what actually called as you know time series structure, and this is what actually called as cross sectional structure. In this case cross sectional unit is a fixed and in this case time series structure is actually a fixed time fixing a particular year, then cross sectional unit really changed, but here cross sectional unit will be constant for a particular industry or individual then time, the reporting will be with respect to time, it may be annually it may be weekly it may be kind of day wise.

But the data will be recorded and reported with a particular structures, either in a kind of cross sectional structure or in a kind of no time tree structures otherwise it is very difficult to understand properly, separate analysis concerned or a investigation is concerned right.

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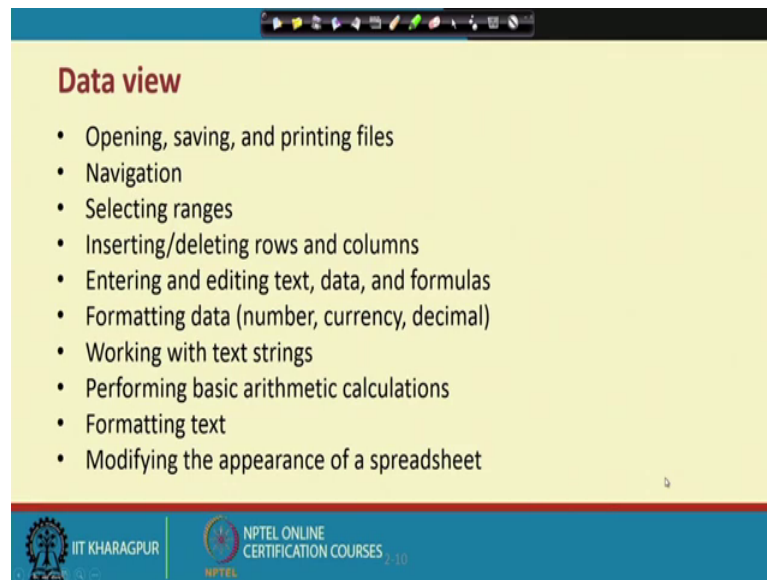
So, now in order to know much about these, we can move to the particular you know us excel spreadsheet. So, we have a plenty of softwares to record the data, to report the data as per the business requirement or you know. So, far as a business analytics you know is concerned. But excel spreadsheet is one of the fantastic softwares it will be very handy and very useful for many advance softwares. And in fact, excel itself really solves some of the business problem by using their tool works and kind of techniques.

So, here in the excel spreadsheet. So, we have actually a complete flexibles, how to report the data and how to structure the data, how to analyze the data we have a different kind of set up. So, in the excel sheet altogether. So, this will help you lot, you know to work in the kind of fields like business analytics to solve some of the business related problems. You only find very beautiful structure through which you report you can actually structures then you can analyze, and then you will find some kind of insight an inference.

So, for, as per the particular you know requirement of business problems.

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So, if you go to any excel spreadsheet. So, the standard you know operation will be like this. So, you have a opening option, saving option, printing options, a navigation, then selecting ranges you can insert a row, you can insert a column, you can delete a row you can delete a column, you can a add ons a means entering more data, then you can edit the data, then you can actually try you know transpose the data you can actually go for some kind of transformations by using some kind of formula.

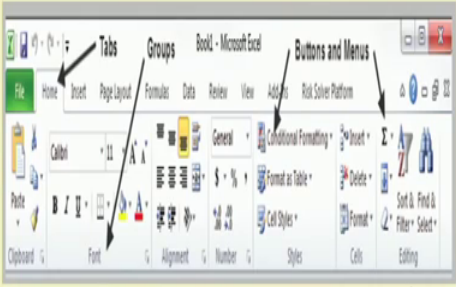Then you have the option of formatting; that means, the same data can be near number format can be currency format, can be decimal format, can be percentage format, then you have the option working with the test strings, then you can go for some kind of arithmetic calculations, then you can have the option of formatting text, then modifying options. So, many things are actually there in that kind of excel spreadsheets.

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So, this is the is you know simple you know structure of you know excel spreadsheet and here is you know you have a tabs, home insert page layout, formula, data, review, view all these things are there. I am very sure all of you are already acquainted with the excel spreadsheet and if you are acquainted its fine just you have to actually revisit if not then you must be acquainted with the excel spreadsheet. Because most of these softwares which you like to use in this particular you know course. So, we are connected with you know excel spreadsheet.

Once you are acquainted with a excel spreadsheet, then enter the data, record the data, structure the data, then the final structure of the data can be imported to any kind of further you know investigation or you know any kind of advanced use of you know any kind of softwares.

But here is excel itself will help you some kind of a process, but you should understand the particular structure first. Then as per the particular requirement either you can solve the problem in the excel spreadsheet itself or you can take the particular data into some other kind of software, and where you can actually investigate as per the particular requirement.

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So, this is what the standard menu altogether, and if you go to the standard menus, then you know you can actually operate the data in a different kind of structure by fixing any kind of in a mathematical formula. For instance let us say this is actually a standard kind of operation is there. So, what you can do with the help of some kind of formula, you can actually transfer the data into a different shape right.

So, this is the particular operation you can do in the excel operations right and then you can actually mark the data you know properly. So, that you can you know recognize as per the particular requirement. So, in the excel entry, the data will be recorded and reported in a kind of matrix structures. So, you will find a row wise representation, and column wise representation and a then you can understand the particular data in a relative reference, and you can have a kind of understanding with a absolute reference.
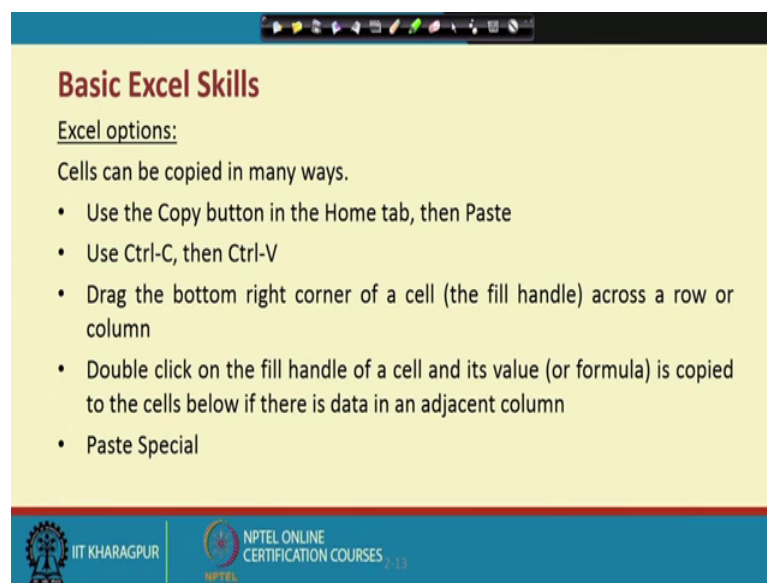
For example; this is what actually relative reference A 2 so; that means, column A second in a row 2, C5 column C you know then row 5. D 10 column D you know tenth row like this then absolute reference same things, but it will be reported to a particular you know particular entry only. So, you must be very careful you know. So, that is how the beauty of this particular you know spreadsheet.

So, once you will be acquainted with this particular system, then you will enjoy the power you know process. So, it will be very handy and it is like playing a game. So, you know data handling is a kind of game, you must have a interest and he should the

particular you know operations, and you should understand the particular structure properly. Until unless you understand until understand until understand until unless you know the particular structure you may not be in a position to operate.

So, the first hand requirement for any kind of business operation or business analytics, that you know you should you know or you know understand the data report the data properly, record the data properly and operate the data properly. So, all these things can be very easily you know can be a done through excel spreadsheet ok.

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Basic Excel Skills

Excel options:

Cells can be copied in many ways.

- Use the Copy button in the Home tab, then Paste
- Use Ctrl-C, then Ctrl-V
- Drag the bottom right corner of a cell (the fill handle) across a row or column
- Double click on the fill handle of a cell and its value (or formula) is copied to the cells below if there is data in an adjacent column
- Paste Special

So, let me give you another kind of structure. So, in the excel spreadsheet you have actually copy options, you have a paste options, you can have a drag options, you can you know drag the row wise you kind of entry, then you can drag the column wise you know kind of an entry.

So, you have actually enough kind of flexibility to operate the data in the excel spreadsheet. Because you once you enter the first hand data so, that data may not be in a structured format, but excel will help you to transfer the data in a kind of structured format, but for that you should know all the operations. And we should know all the commands.

Once all the operation and you know excel commands, then it is very easy to operate the data and put the data in a kind of structured format. So, that you can analyze as per the

particular requirement; either excel itself will give some kind of solutions or insights or by reading all these data and then with these insights you can solve some of the business problems and can take a management decisions. And on the other sides once you make the particular structure, in that particular you know structured data can be used further investigations and then you will get much better inference for the management requirement.

But actually the excel has a beauty to you know to handle the particular problem in a better safe and analyze the problem as for the particular management requirement.

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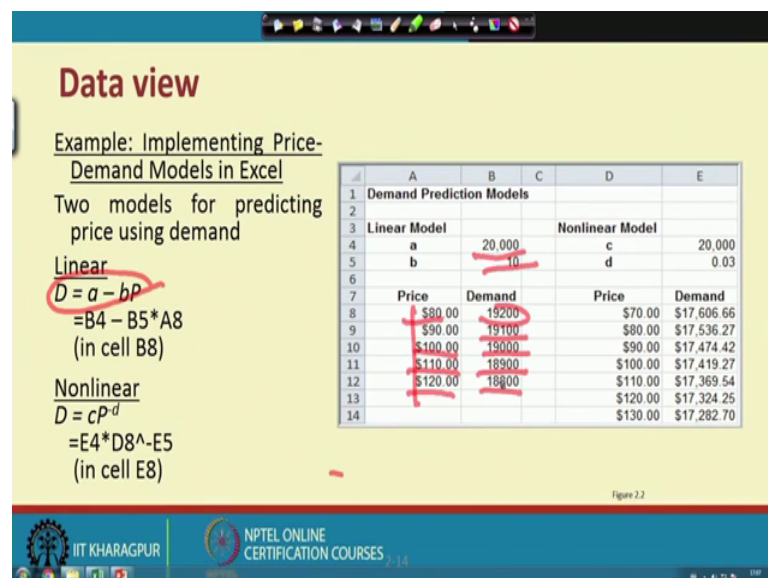
So, I will give us you know kind of an examples, that excel has a kind of flexibility that you can predict the kind of situations, you can interpolate you can extrapolate. So, so many things are there.

So, you the drag of some is a very beautiful you one of the very beautiful features of you know excel spreadsheet, which can help you lot to transfer the data or you know can a structure the data as per the particular requirement. Here the classic example is you know the demand price models where you know if price is given. So, with respect to some condition, then you can actually predict the demand as per the particular requirement and as per the requirement of a business model.

So, usually price demand structure is like that you know you must have a price, then corresponding to price what should be the demand forecasting's. So, the typical you know as usual relationship between price quantity can be analyzed like this, this is called as a linear representations between price and quantity, and this is what is called as a non-linear representation with respect to price and quantity. And here there are four items if you go to the linear kind of this model.

So, D equal to a minus b P; so a b are parameters and D is a kind of variable P js a variable, P stands for price D stands for you know demand and a is constant and b is constant. Now, once the values of a and b, then with change of price you can you know predict the demand, but the a b actually not constant, but it will be estimated through past values and once you through some kind of advanced analytic analytics tool, and which we will discuss in the later stage.

But in the mean time since it is a kind of excel view operation. So, assuming that you know a b is a constant, then p g givens you are supposed to you know forecast the demand only. So, now, how excel can help you in this particular process, that we are interested to know. So, then I will take you to the excel spreadsheet, and let you know how it actually operates in this particular process.

This is a linear kind of structure so; that means, here a you see here a is givens a b is givens and prices is changing like this, corresponding to this price this should be the demand. Because the demand equation is here d equal to a minus b p, and then when price will change then demand will change when price will change again 200 then this will be changing in demand.

Then price is changing 210, then this is also changing demand and 120 this will be also having you know some change; that means technically. So, the model you know a model can you know give some kind of information that when there is variation in price, then there is a variation in quantity.

So, here we are following a kind of increasing price trend, then we are finding a here the structure that you know it is the quantity in here decreasing trend, because the model is showing some kind of inverse relationship, why because the slope coefficient is coming negative. So, that is why you know this is a standard kind of theoretical framework or the

kind of given model, and we are here predicting and testing this models and excel will help you lot for this kind of testing and for this kind of predicting.

So, let us see how excel can you know we will go for some kind of demo, then we get to know how actually happening in the excel sheet. Then you can easily understand you know what is the beauty of excel spreadsheet all together right and this is the another kind of loop here. So, if you go to the same problem, but it is a kind of non-linear kind of modelings; That means, against this will add value to the excel spreadsheet that, whether it is a linear model or non-linear model, but excel can help you lot to analyze these problems right that is again one of the interesting and beauty of the use of excel spreadsheet.

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So, now I will go to this particular. So, this is another kind of structure through which you know analysis, because the previous one is indication about the kind of what I can call or let me take you to the previous one.

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So, this is actually the kind of structure, we followed through absolute reference then.

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This is the structure we are following through you know relative reference right.

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So, the game between relative reference and absolute reference, then in the forecasting can be done. So, by using you know dragging options.

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So, in the meantime the same structures; so what we can do we will take you to the particularly in excel sheet and I will show you the demo.

So, let us say this is actually the same problem, the same problem here. So, I have enter here data and your model will be like this. So, the model will be like this, D equal to A minus B P. So, this is about the model and A is given here. So, this is A value and this is actually B value and P is now changing with respect to with respect from 82 or you know let us say 120.

In fact, we take up to much then this is actually average of this particular series. And then we will check actually when price is changing from one point to another point of how the demand is changing. So, then what will it do. So, we will go to this particular you know structures. So, let us say we have I have already calculated these particular structures.

Let me give you the demo how it is actually happening. Let us you know you just put the equal to options, then by default now the you know cross word is ready to operate right. So, what will you do? You have to just give the command then automatically this will give you some kind of prediction. For instance here the model is actually represented here D equal to A minus BP then by default what I will do here. So, I am just writing here 20,000; 20,000 then minus 10 minus 10 into then this I will indicate this price structure then I will just put enters ok.

So, now you see here is corresponding to this price the demand is this much only. So, which is actually matching already, we have forecasted and we are just cross checking that you know showing that yes this is working properly. Then you just you know what

will be caused dragging options then you can just drag it and automatically by default. So, it will automatically give you the prediction value of the demand, subject to you know price change.

So, when 80 to 90 then it will live with changed from 19200 to 19100. When the price again changing 200 then this will again reduce to 19000 so; that means, this is what actually the particular you know structure. So, this is what I have actually used for the kind of demand you know demand forecasting subject you know price availability.

Now what I will do here is, I will take you this this particular testing can be done in two different ways which I have already highlighted here in the case of you know see here. So, this is what we have actually a pointed out here is this particular structure here we have represent you know a relative reference and absolute reference.

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So, the model which I have tested there is with respect to actually a relative reference; just we specify this particular you know row and column then it gives indications this is the structure which I have already highlighted they are right, so ok.

That means technically, so this particular structure which you pull it this called as you know relative reference. Using the relative reference we have actually tested the model and you know using excel sheet, how prediction is happening. So, similarly we can do through absolute reference, this is also another way to predict the particular you know

environment. Go to this particular again in the spreadsheet and again. So, what I will do here is.

So in fact, I have already done here is in the case of you know this is what actually what I have explained here, in the case you know a relative reference now I am showing you in the case called as you know a relative you know absolute reference, but. So, go to this modular. So, this is actually the kind of relative structures, and where we are actually you just you know put the values and connect with a particular you know column indications.

So, in this case, you have to actually a apply the absolute kind of structure through which you can predict the particular you know environment. So, now, in this case in, ok. So, and. So, what you know what will you do here. So, this is what actually we have done here. So, now, in this case, we are actually reporting the price figure and quantity figures and the price is changing from 80 to 90, 100, 110, 120.

Then it will give you some kind of demand forecasting. So, this is with respect to a relative reference, and this is with respect to absolute reference right. So, in the absolute reference you have to just you know connect with your particular column and the row indications, then you apply the dragging of sums as a result it will give you some kind of structure about the demand forecasting's.

For instance here is here you can actually use some of the other options to know much better about this particular you know demand forecasting. For instance let us put you know equal to here is you can you can able get to know what is the average price like you know put here what is the average price during.
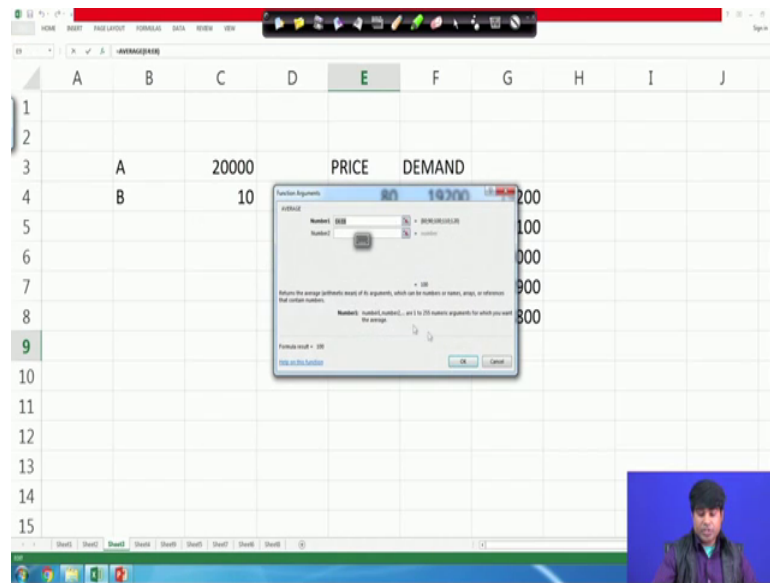
This particular you know five different periods, then what is the average quantity which you can have actually in this particular structures. So, put it this average.

So, the you know this will give you the average kind of structure about this demand forecasting so; that means, actually what I can say that, excel has a beautiful kind of structures through which you have to do lots of you know operations, you know to solve some of the business problems, and structure the data and then you know use this particular data for further kind of investigation by using advanced analytical analytics tools.

So, these are the various you know ways we can handle the particular you know situations, but the thing is that what I can say that you know excel you know or use your excel understanding is one of the a basic requirement or you know I can say precondition for any kind of business analytics or business investigation is concerned.

So, in this lectures what we have actually discussed that you know you understand the business analytics structures. So, far as you know various tools are or analytics baskets are concerned that is on the basis of descriptive analytics, relative analytics, prescriptive analytics and then you know and then you with the help of you know data structure you know data understanding and you know excel operations you may be in a kind of better position to get some kind of insights or you know inference for some kind of management decision to solve the business problem.

So, what I can you know summarize here that you know before you start any kind of investigation through their business analytics, one of the fantastic key you know or key requirement is the data, and you have to understand the data and you have to report and record the data as per the particular requirement, and against with the help of excel sheet you can operate the data or structure the data as per the problem requirement or you know any particular analytics tools requirement.

Once you do that and you know then you may be in a better position to analyze the problem as for the a particular you know requirement. So, summation is that you know you must you know the kind of data structures, and then you must know how excel spreadsheet can you know use for data entry and data structuring.

So, against after knowing all these you know basics about excel a spreadsheet. So, you can also analyze the same problems by using excel data analysis package or else you can go for some advanced you know analytics or you know softwares through which you can you know same data can be operated that means every softwares has a kind of import and export features.

So, you can actually open another software and then import the data excel data from one file to the particular software, and then through advanced analytics tools you can solve the business problem so that means say. So, what is what I like to say that you know excel spreadsheet has a beautiful kind of structure, through which you can solve some of the problems and it will help you lot to use the data for you know problem requirement or you know problem investigation.

So, it is actually very much required that you know you should understand the data and you should know details about the excel spreadsheet. Until unless you know the excel spreadsheet or the use of excel spreadsheet, you are not in a position to analyze the problem in a more attractive way. So, that is how you have to know all these details before you proceed for any kind of advance investigation. With this we will stop here.

Thank you very much. Have a nice time.