Technology Forecasting For Strategic Decision Making - An Introduction

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Demo of S-curve fitting software

Hello, and welcome to the technology forecasting for strategic decision making. We made it this far it is one of the most exciting modules, I am happy to introduce you to. We have done covered bits of this in the past about how to take data and look at the trend and predictions we have done that in the past, but now we have a software provided by Rockefeller University they have been kind enough to share the code with us and we are also happy to tell you that it is accessible for all learners at NPTEL, I will demo this software to you and you can as learners you can use this software and download the results for yourself, use it as you can.

Our request is for you to leave the tray the copyright the symbol in there to acknowledge the contribution of Rockville Rockefeller University's project so that is that is our request to you, so I am going to be showcasing the software itself, I will just show you in a little bit what is the software all about you will see and we will also play around with some data.

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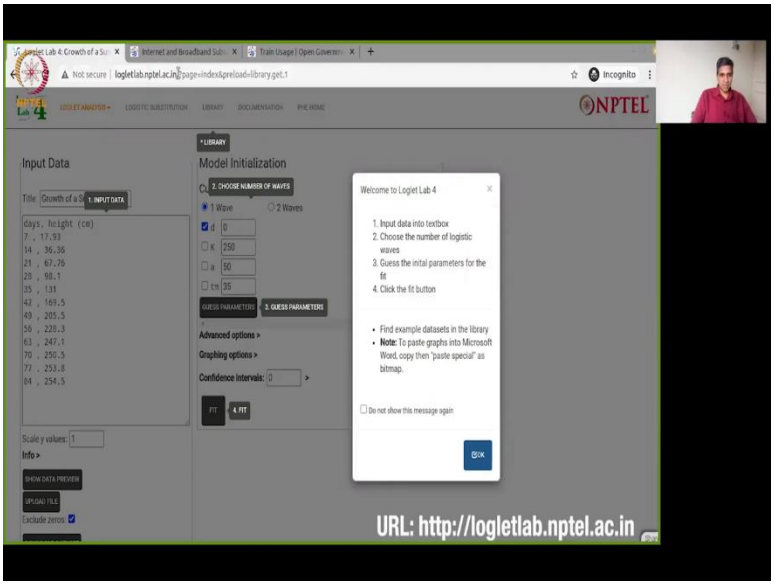

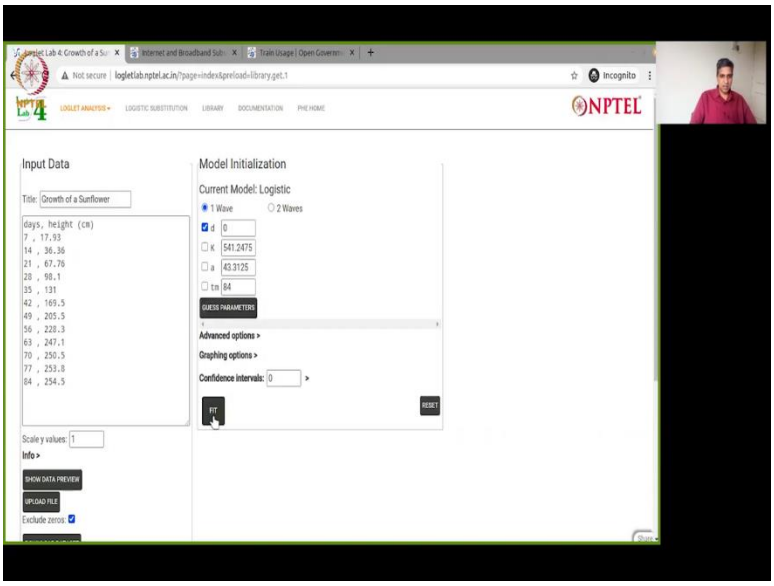

What you can see is first of all let me show you the URL, the universal resource locator, URL is logletlab dot nptel dot ac dot in (logletlab.nptel.ac.in) , it is right here up here on my browser logletlab dot nptel dot ac dot in (logletlab.nptel.ac.in), you do not have to enter the rest of the stuff, it's automatically input there.

Once you have it in there you will get to this page it will do all the, since its the first time if you log in it will show you welcome to log let lab you can look at all this, and of course if you were into come here often and I do not like, I mean, once I know what it is you can also check out what is what is up what are the different aspects of this software itself, there's a FIT button, there's a GUESS PARAMETERS, CHOOSE NUMBER OF WAVES, a LIBRARY with some predefined set of data that we have, and input data that you will be using a lot. So, that is the basic outline of this software, and I say, this theres a predefined library data, there already there, growth of a sunflower, I will just show it you how it is to be done.

First, step one is to click on GUESS PARAMETERS, that does a guess of parameters, please refer to professor Dmitry's explanation on what these parameters are in an earlier video, you should be able to find that out what tm is, what k is, what a is, what d is, we have in this course only looked at one wave model, but if you know about this and you want to play around, please feel free the URL is of course accessible to you, and then we click on FIT.

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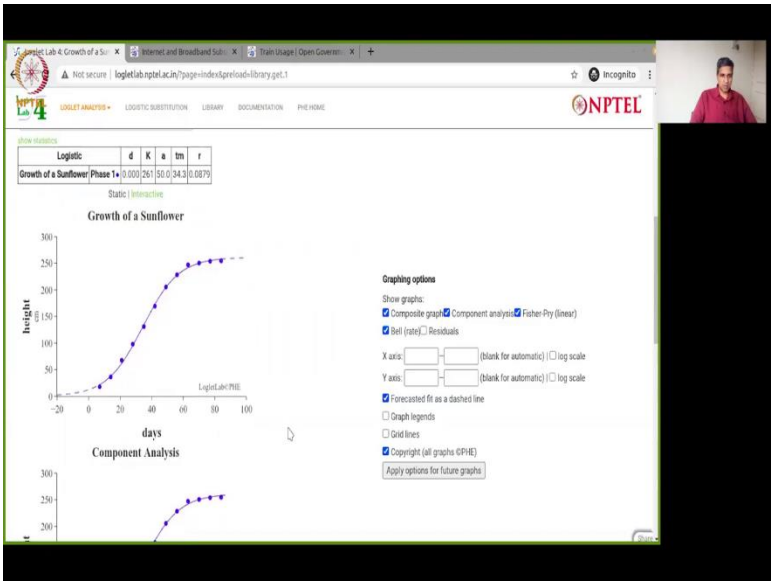


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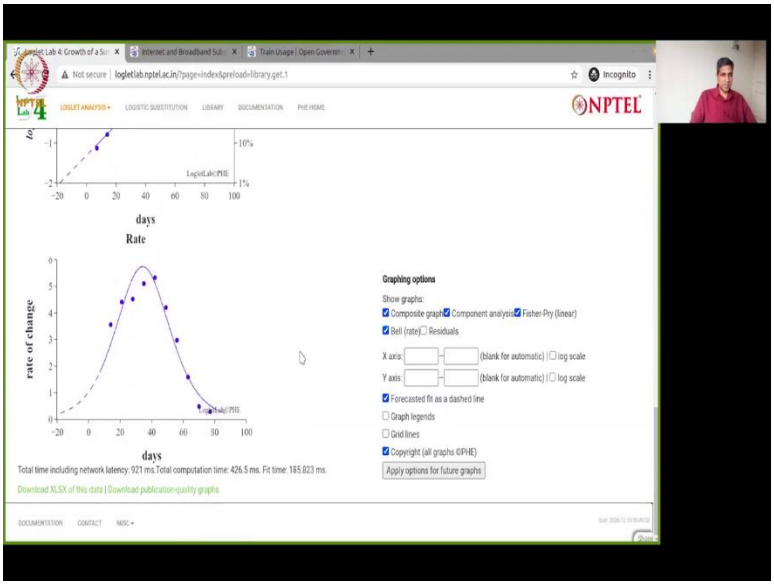
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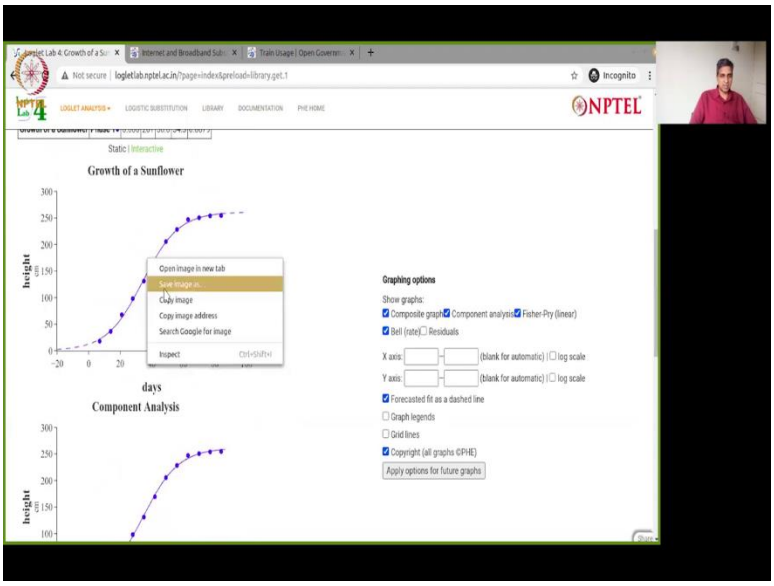

And, if you scroll down you will see the FIT it has the the FIT has been done, you can look at the growth of a sunflower and all the parameters listed here and you can you can look at all the Fisher-Pry, component analysis, all that we talked about in our earlier video. So, as simple as that this is it, so if you want to download any of these pictures for yourself all you need to do is right click and click on save images as and it is for you. I request you to leave the copyright in there, the copyright all graphs at PHE which is the project which has provided us this software. So, that is our request again.

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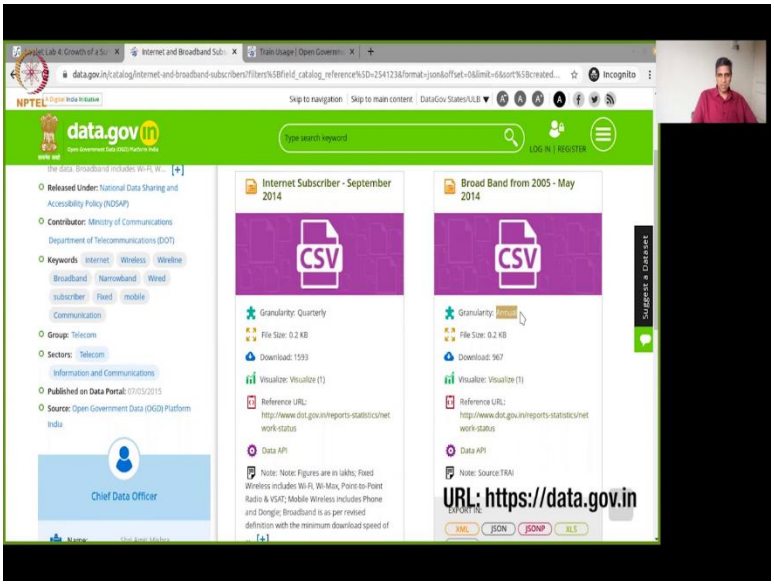

And now what we are going to do is, we are going to input another set of data, I have looked at data dot gov dot in (data.gov.in) and I have downloaded broadband from 2005 to May 2014, the source of data data dot gov dot in, it a csv file, comma separated value file, granularity is annual, so just go ahead and look at this annual data. And what I have already done is, I have cop I have copied it into my editor and let me see if I can show you, just a second.

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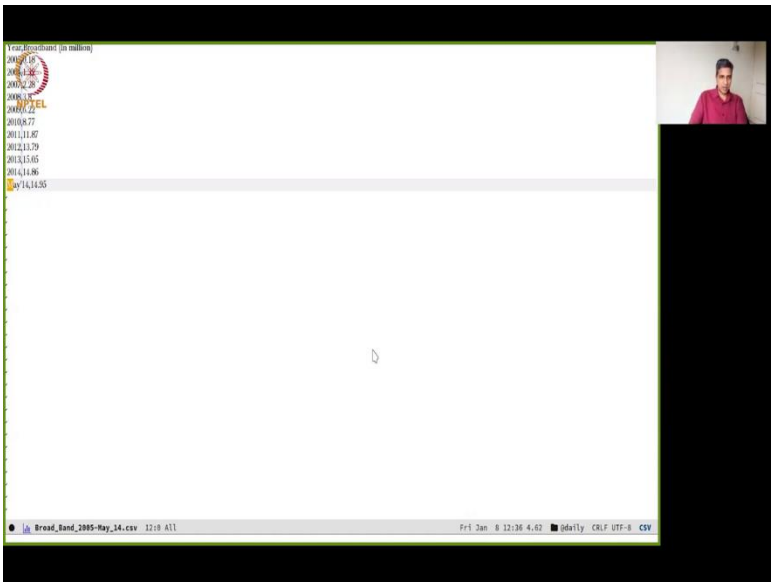

So, this is the data that I downloaded from data dot gov dot in (data.gov.in), about broadband usage in India from the year 2005 to 2014. There is one data point that loglet will not, loglet is the name of the software that we're using, loglet will not parse which is the last one you can see it is in May 2014.

So, normally if you are touching data you need to make a note of it somewhere, so in your documentation you have to mention that you are tinkering with this data or you are not including this data point in your analysis, because source data has this data point whereas your final analysis does not so you should make a note of this in your documentation. So, here I am just going to delete this data and save it and we can copy the entire data point and go back to our loglet lab which I will show you in a moment, go back to, and we are back to loglet lab.

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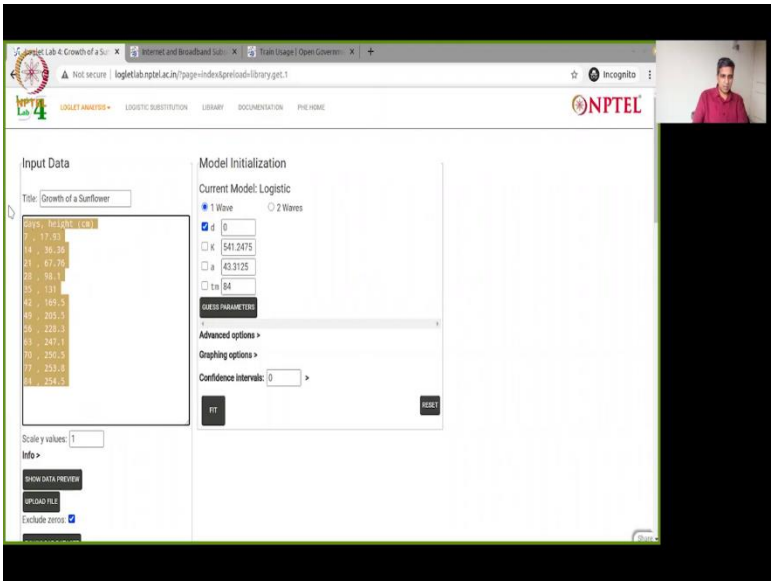

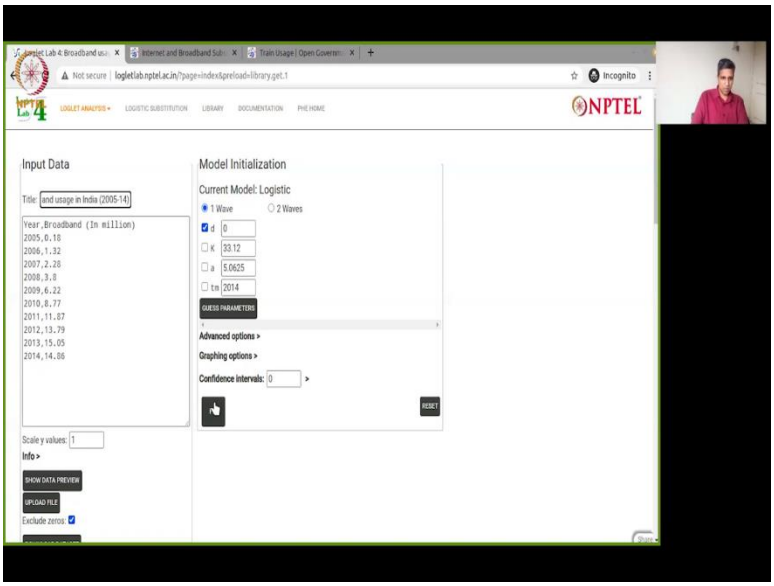

And here you can just copy this entire thing and paste it here, that is all you need to do. Now again go back step one GUESS PARAMETERS and FIT, and it will do a job of fitting, oh, I did not change the title, so let me change broadband usage out not broadbank, broadband usage in India 2005 to 14, and now, click on FIT.

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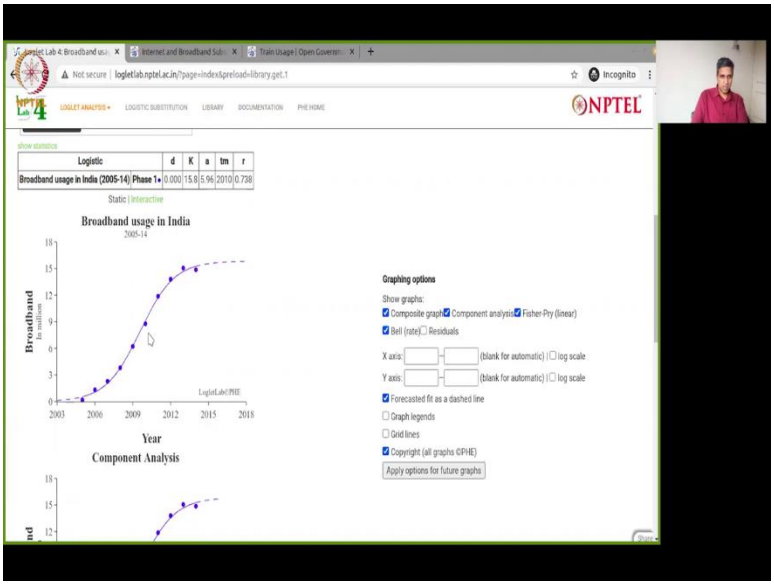

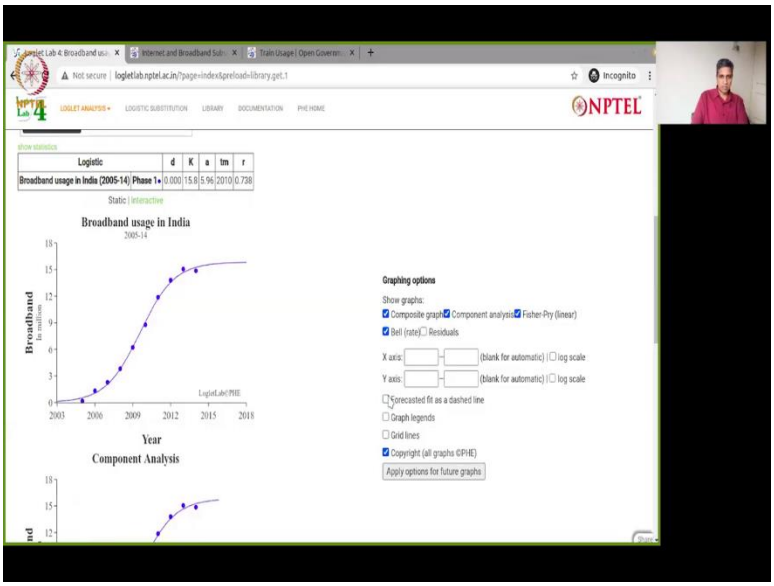

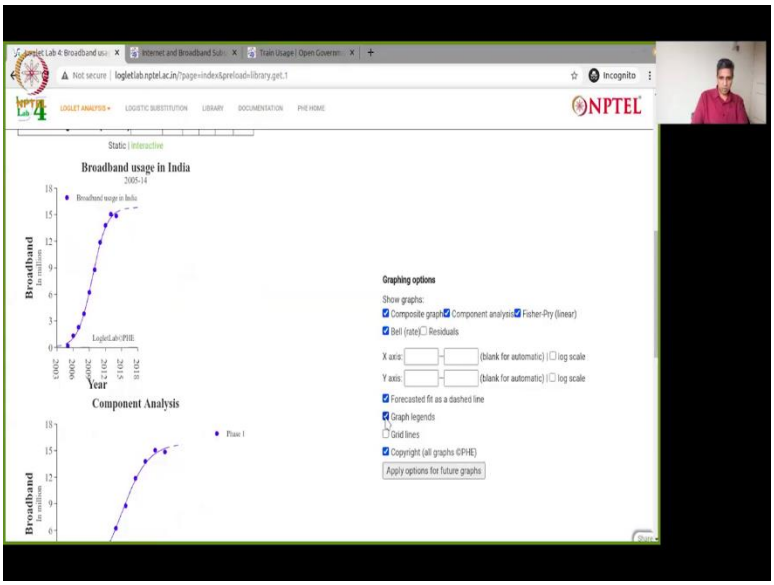
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Broadband usage in India
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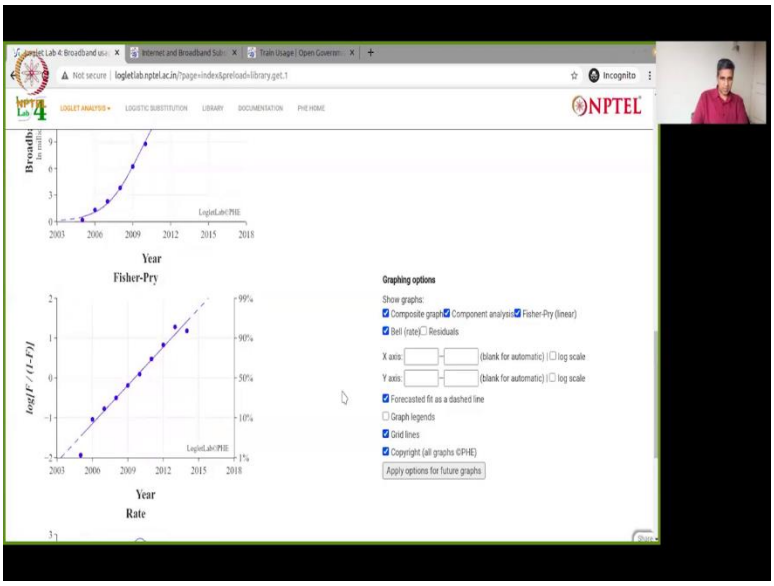

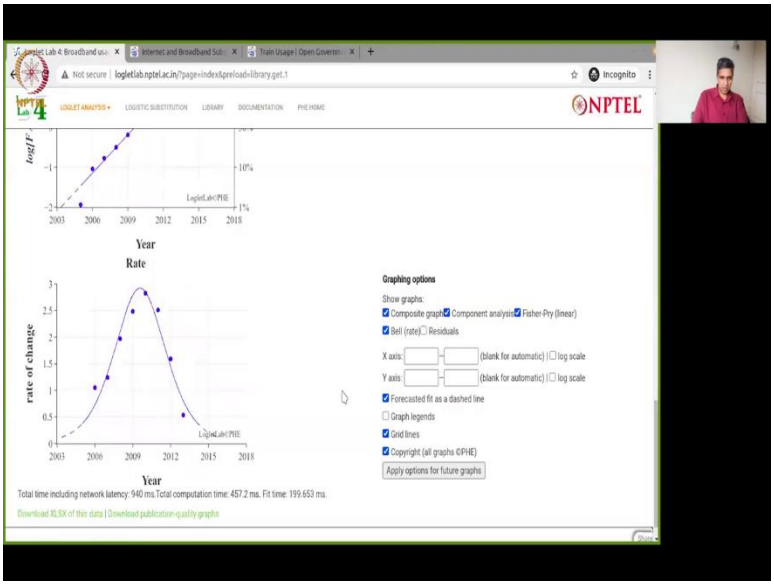

It will do a FIT and you can see it has done the FIT given your parameters tm is 2010 midpoint, fairly good fit and saturation is given it is forecasted it, you can see that Forecasted fit as a dashed line, if you do that, if you uncheck it, it will give you a solid line so that is something we can do, if you want graph legend, you can do that, we get smaller, if you want gridlines you can add gridlines as well, somewhere it should apply options it will remember based on cookies it has, these will set cookies so you will be able to see, some of your settings saved, so all of this is there for broadband usage in India, source of the data is data dot gov dot in (data.gov.in).

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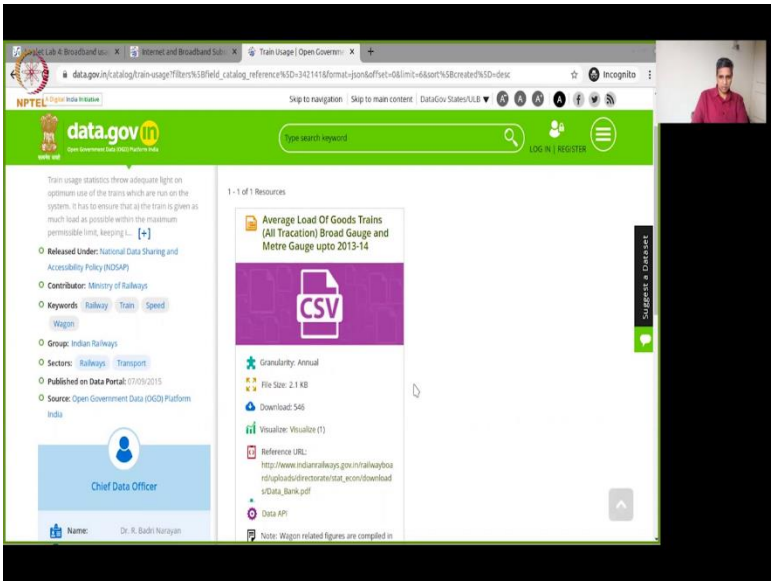

Now I have another data that I want to show you which is a fairly complex bit of data, this is average load of Goods Trains broad gauge and meter gauge up to 2013 to 2014, 2013-2014 it is a long data set, it is a big data set that I will download from data dot gov dot in (data.gov.in). Thankfully, I have already downloaded this, but this is the source of data data dot gov dot in (data.gov.in) the entire URL will be posting, I will show you what the initial data looked like.

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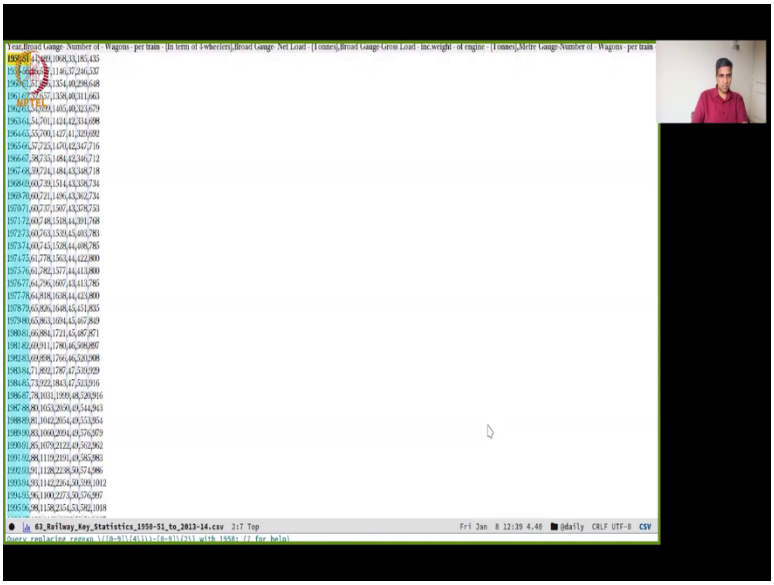

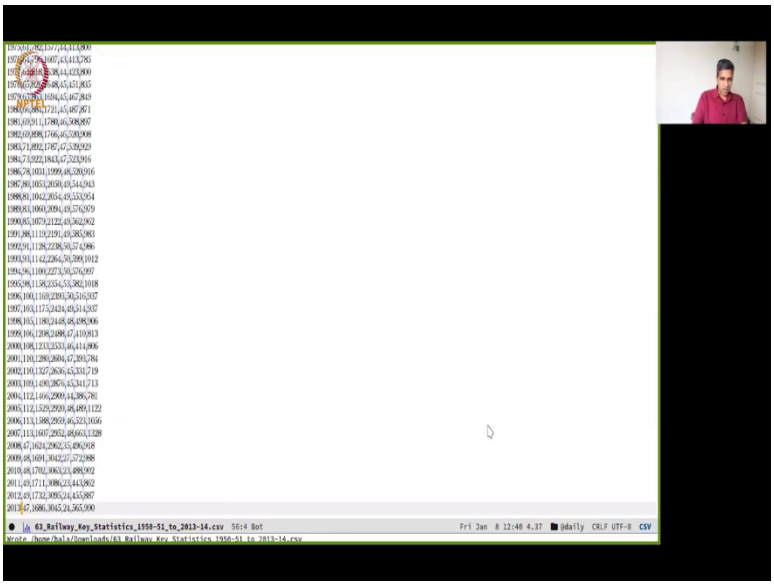

So, this is the initial data that I downloaded from data dot gov dot in (data.gov.in), unfortunately this is not usable as such because, there is the in the year it is given a range 50 to 51 which is humanly understandable, but in parsing this will fail, so we need to remove that again as I remarked earlier whenever you are tinkering with data always always make a note of it let anybody you are sending a report to know that the initial data was this, and this is the data let say for a lack of better terms manipulation that you have done, and you have to clearly specify that, which is what I did.

So, I did a search and replace of changing the data, as you can see the entire with regular expression I have done this and its changed so no data or the year has been changed but I have made a note of what a regular expression I used to parse the data and replace it with the year alone, so that is one note to be made. Now I will copy this data.

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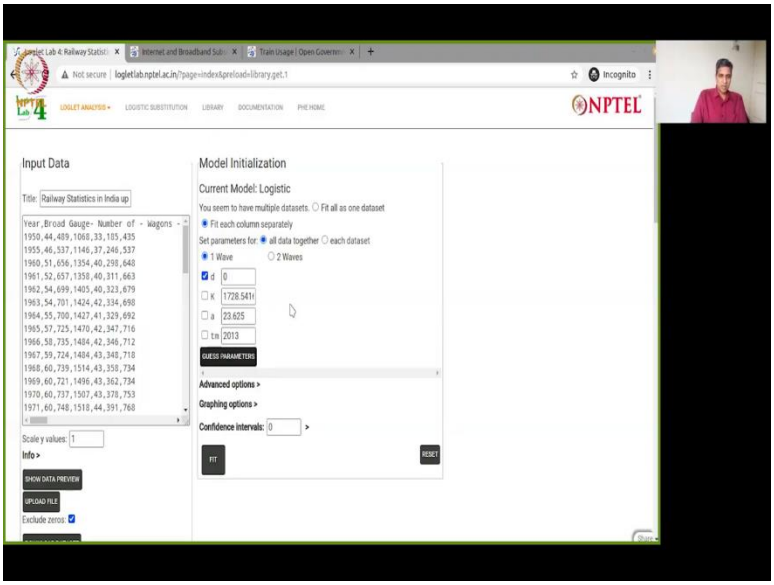

And this is actually multiple sets of data, it has, as you will see soon, I will show it to you very quickly what we have done, so we are back here and now I am going to paste this data here, so I am just doing copy and paste and nothing fancy about it the same data that we removed the hyphen and the second next part of the year, we have removed it using regular expressions, and I will of course change this into Railway Statistics in India up to 2013-14 case source is data dot gov dot in (data.gov.in).

In the same way this is now you will see that here there is a little change from the earlier one, Fit all as one data set, it is not one data set but actually there are several data sets if I go above there is a heading here which you will see, I will shortly tell you what all data is there and Set parameters for all data I tried it as each data set and it gives me an error, the software gives an error, of course I will take it back to the development team to let them know there an error but we will treat all data together, so that is what we will to do, two waves you can mess around with this also it give me an another error, also I am going to report back.

Now we will GUESS PARAMETERS, it has changed the value tm is 2013, it is treating all of it as one data set there is an error, there is a problem with that treatment, and let us see what we get in FIT. When you FIT it, let us see what we got it takes a while because there is a lot of data in there from 1950s to 2013, about 60 years of data, server takes a bit of a time bit of time we will soon see yes.

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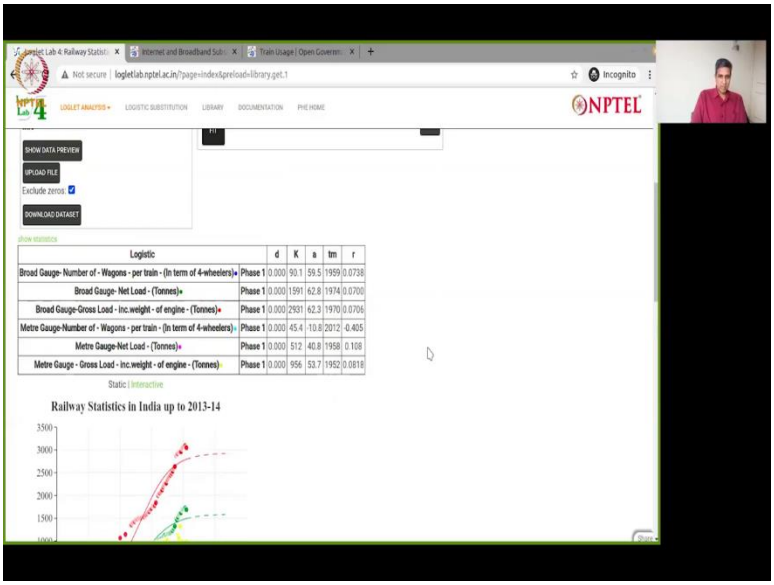

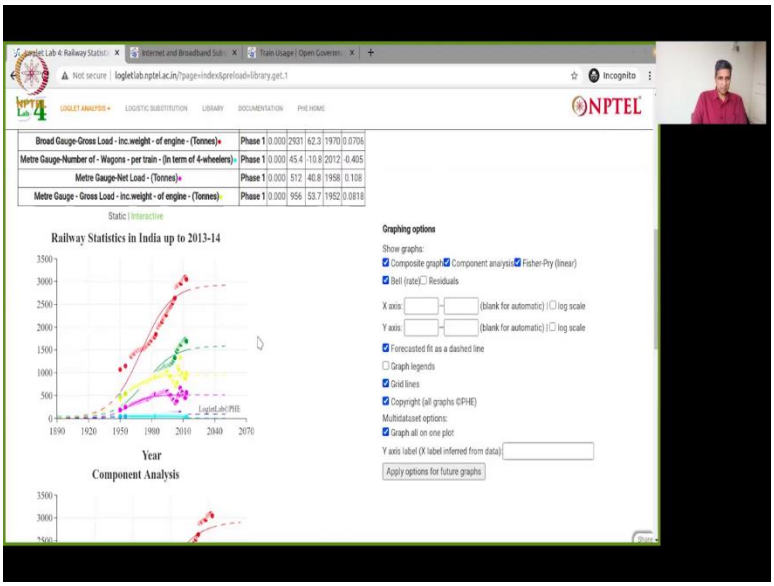

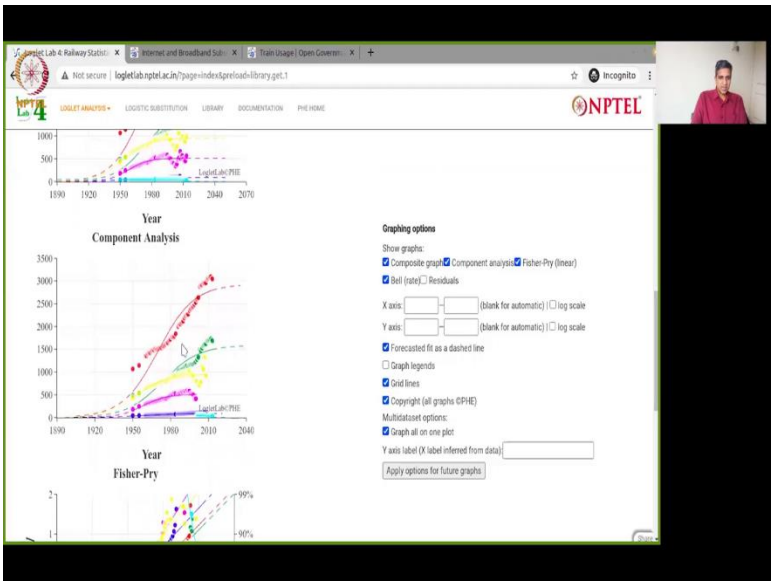
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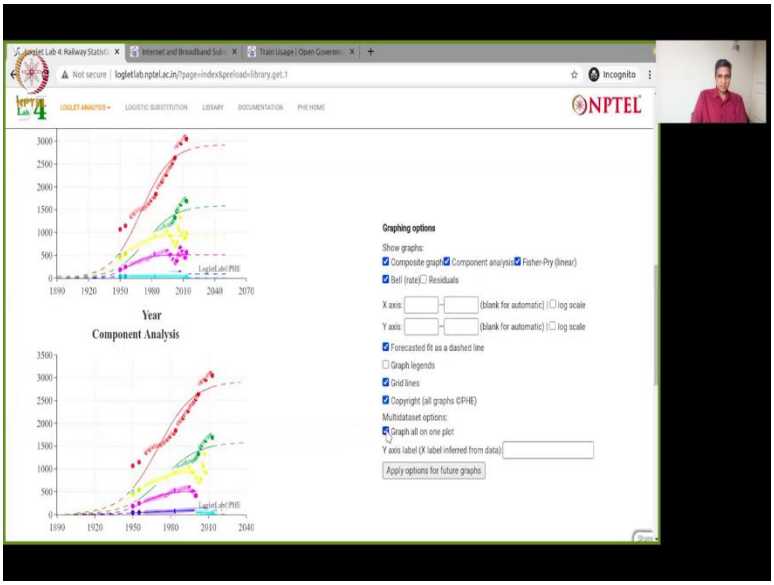
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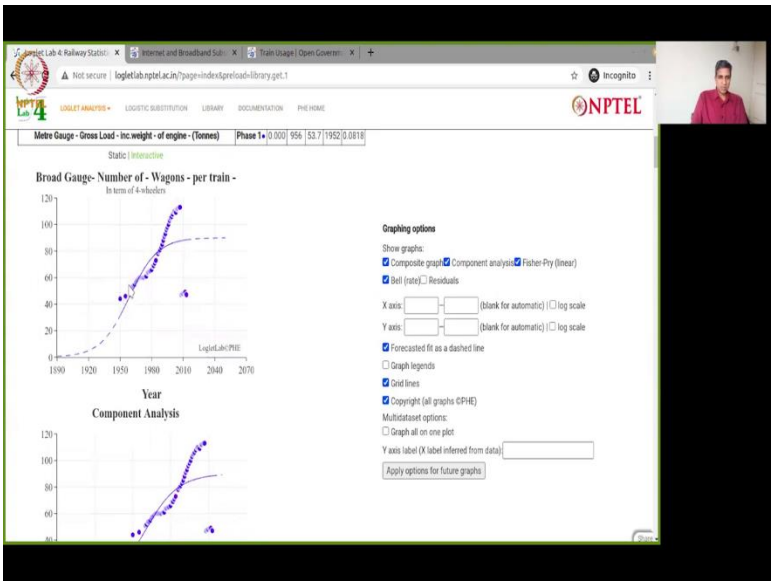
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Broad Gauge- Number of - Wagons - per train -
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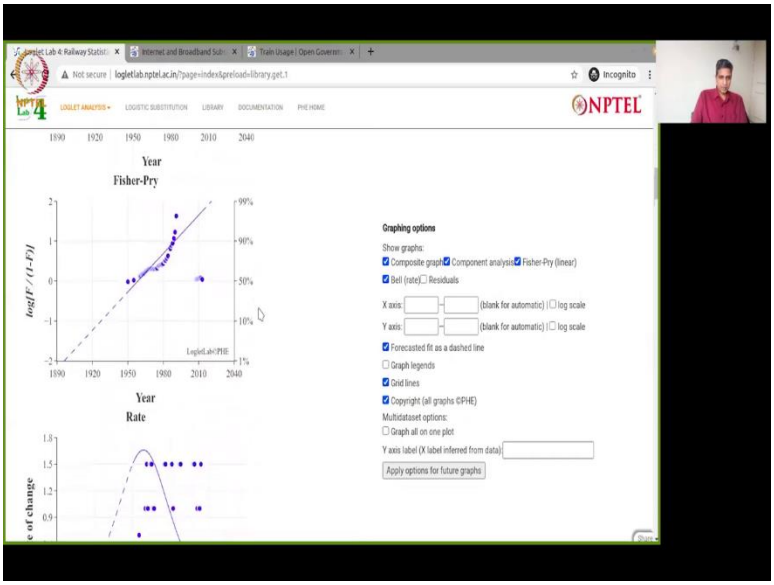
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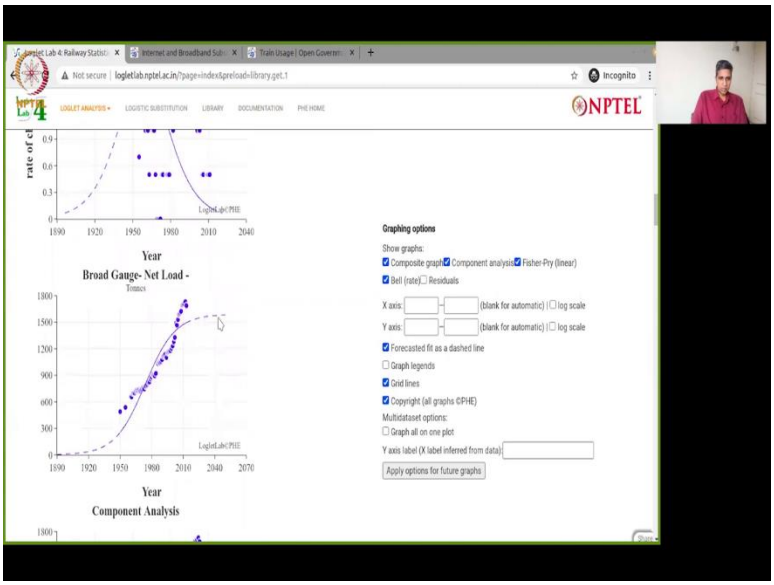
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In term of 4-wheelers
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X axis: (blank for automatic) log scale
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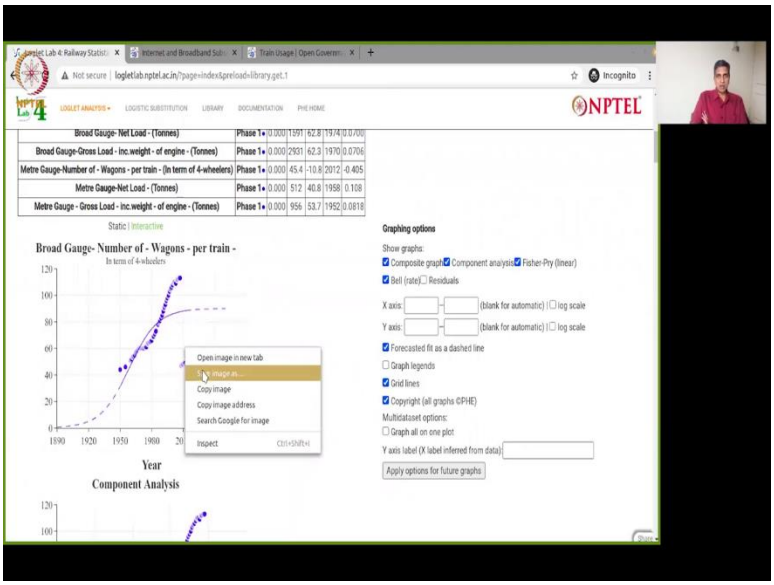

So, this is the terms that were used in the the logistic was broad gauge number of wagons per train, broad gauge net load, broad gauge cross load gross load, I am sorry broad gauge gross load, meter gauge, number of wagons per train, meter gauge net load, meter gauge gross load, incremental weight of engine, and tons tons in terms of four wheelers tons tons.

So, all the units are also given, all the tm is given here, which is the mid median times point, so for each of these parameters it is actually calculated and you will see a plot all of them together it looks a bit messy in case you want to plot it this way you can certainly do it with predictions there so saturation, what I do not like, is the fact that it is actually these are some two wave data, three wave data, it is actually clubbed them all into one they are not able to tease it out, one idea you could possibly do is open your cs favorite csv software, just treat data by data one by one after the other and you can do it, there is a neat way to do it here separate plots we can say graph all one plot.

So, this, these options come when you go when you scroll down, you can get these options it automatically appears, just uncheck it and you will watch what happens, it will actually separate out the software actually separates out the plot. So, here you can see broad gauge number of wagons per train, so as you can see there are multiple waves, in this so it not fair to treat it as one wave and the Fisher upto the Fisher-Pry transformer rate is also here, net load also there are multiple waves, component analysis you can see.

So, I wanted to take a complicated piece of data and then show you, of course here is a dip meter gauge, as you some of you probably know is phased out in India, so the number actually drops and thats clearly seen by the prediction, also it not complete zero still theres some amount so you can see when it will get phased out. So, that is that is have fun with this data for with the software, take your own piece of data go to data dot gov dot in (data.gov.in), download a csv just make sure that all of this is numeric data, if there is non-numeric data parsing is not so easy as far as I know I have to talk to the the technical team over at Rockefeller University in New York to find out if that is indeed possible, if non-numeric data can be input here.

But as far as I have seen numeric data and that to solid data like this, works very well works really really well and have fun, feel free to look around in the software change any option there are advanced options graphing options all you can just try around of course if you want to save we have, you can right click on this plot and say save images and save it to your desktop or folders and you can use it in any publication or anything report that you are generating out of this.

So, have fun and let us know in the discussion forum what your experience has been with this software, will be happy to take your input to back to the Rockefeller team and again thanks to the Rockefeller University team for providing us with this software. So, see you, thank you so much see you in the discussion forum then thank you.