Customer Relationship Managemen
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Lecture – 27
Customer Equity in CRM (Contd.)

Hello everybody. Welcome to the course NPTEL Swayam course on Customer Relationship Management. This is Dr. Swagato Chatterjee from the VGSOM IIT, Kharagpur who is taking this course, we are discussing about Customer Equity and the relationship with that with the acquisition and retention spent.

So, how do you decide how much money you will spend on acquisition and how much money we will spend in retention? And this is a pretty important problem because we all know that retention is more important in the context of CRM than acquisition. Now if it is more important, how much more? What is the ratio exactly in the monetary terms that you want to spend on each customer or each potential customer in case of acquisition ─ that we will be discussing here in this particular case.

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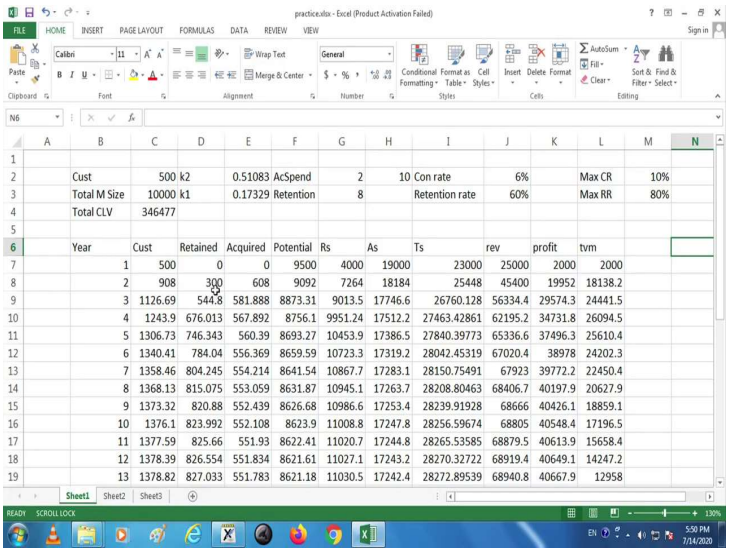

	Cust	500	k2	0.51083	AcSpend	2	10	Con rate	6%		Max CR	10%	
	Total M Size	10000	k1	0.17329	Retention	8		Retention rate	60%		Max RR	80%	
	Total CLV	346477											
	Year	Cust	Retained	Acquired	Potential	Rs	As	Ts	rev	profit	tvm		
	1	500	0	0	9500	4000	19000	23000	25000	2000	2000		
	2	908	300	608	9092	7264	18184	25448	45400	19952	18138.2		
	3	1126.69	544.8	581.888	8873.31	9013.5	17746.6	26760.128	56334.4	29574.3	24441.5		
	4	1243.9	676.013	567.892	8756.1	9951.24	17512.2	27463.42861	62195.2	34731.8	26094.5		
	5	1306.73	746.343	560.39	8693.27	10453.9	17386.5	27840.39773	65336.6	37496.3	25610.4		
	6	1340.41	784.04	556.369	8659.59	10723.3	17319.2	28042.45319	67020.4	38978	24202.3		
	7	1358.46	804.245	554.214	8641.54	10867.7	17283.1	28150.75491	67923	39772.2	22450.4		
	8	1368.13	815.075	553.059	8631.87	10945.1	17263.7	28208.80463	68406.7	40197.9	20627.9		
	9	1373.32	820.88	552.439	8626.68	10986.6	17253.4	28239.91928	68666	40426.1	18859.1		
	10	1376.1	823.992	552.108	8623.9	11008.8	17247.8	28256.59674	68805	40548.4	17196.5		
	11	1377.59	825.66	551.93	8622.41	11020.7	17244.8	28265.53585	68879.5	40613.9	15658.4		
	12	1378.39	826.554	551.834	8621.61	11027.1	17243.2	28270.32722	68919.4	40649.1	14247.2		
	13	1378.82	827.033	551.783	8621.18	11030.5	17242.4	28272.89539	68940.8	40667.9	12958		

So, there is a excel file that has been given. There is lots of calculations given here and I would probably, the first thing that I will do is: I will delete this whole table. So, that you remain with me at the same page. I have deleted the table.

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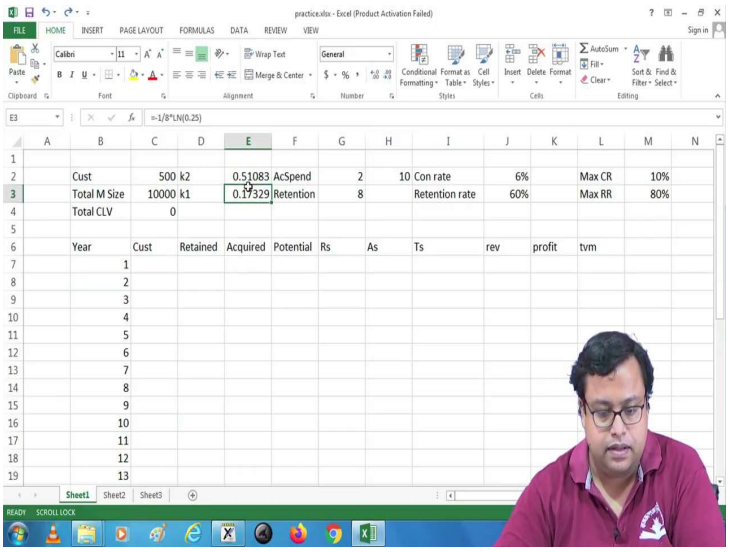

So, let me tell you the problem first. So, the problem so, let us delete this and delete this also, the problem is like this that okay.

So, the problem is like this; whatever is been written here right now. Let me zoom a little bit. So, there are a company which has 500 customers and the total market size is 10000. So, 500 customers it has and 9500 customers are outside the market. They are the potential customers they have not been acquired yet. 500 customers have been acquired already.

So, this is the two values that has been given to me. . Now what? This customer, this company generally spends 2 dollars per potential customer, 2 dollars per potential customer for acquisition spend, and 8 dollars per existing customers for retention spend. 2 dollars per potential customer; that means; if I have *9500, then 9500 into 2 19000* dollars part time period, let us per month.

I do acquisitions expenditure and retention expenditure is 500 customers, I am spending 8 dollars fair enough. So, 4000 dollar is the retention expenditure. And while it does that, by spending 2 dollars it gets 6% conversion rate, acquisition rate and by spending 8 dollars it gets 60 % retention rate.

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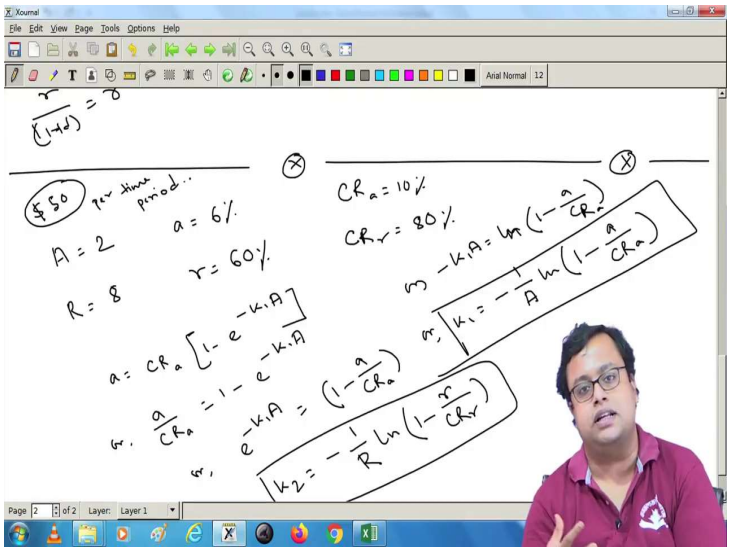

So, what do I have basically? I am saying that when A is equal to 2, when *A is equal to* 2 ; my small *a* is equal to 6% and when retention is equal to 8; my *r* is equal to 60 %. These are the two things that have been told to me, fair enough. Or it has been also told that the maximum possible conversion rate, the ceiling rate and the maximum possible retention rate is 10% and 80 % through the ceiling of acquisition is 10% and ceiling of retention is 80% .

Now, it is asking me, what should be the optimal acquisition and retention spend. So, let us do this thing. So, what do I know? I know that a is equal to *CR a 1 minus e to the power minus k 1 into A* do I know that or can I write a by *CR a is equal to 1 minus e to the power minus k 1 A* . I can write that or I can also write this then just changing the side.

Or I can also write this then, fair enough then I can write this. So, by using this formula I can calculate the value of k1 similarly k2s formula will be nothing but, something like this; these are the formula. So, based on these two formula; first thing that I will do is, I will calculate *k1* and *k2*. Let us calculate k1 and k2 first. So, what is k1? Let me just put it here, what is k 1 and what is k 2, what is k 1 and what is k 2.

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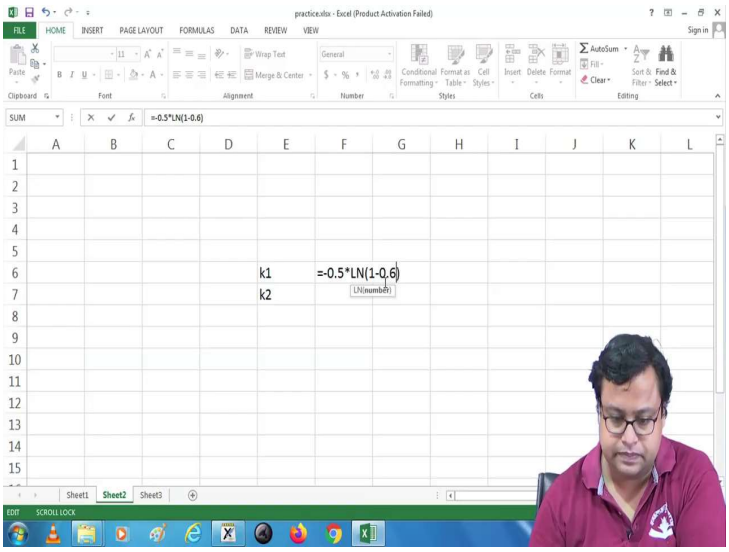

The k1 is basically *1 by a a is 2*. So, *minus 0.5* then *write 1 by 2 is 0.5 into log of 1 minus* something and what is that something? *Into 1 minus* this is 6% and *CR a* is 10 %. So*, 6 by 10 – 0.6* .

That is my *k1* fair enough . And what is my *k2* then in this particular maths? Just *1 minute minus 0.5* just let me okay. So, this might be wrong. So, I will I will come to this and what is what is *k2*? *k2* is *minus 1 by 8 minus 1 by 8 into LN1 minus small r by CR*, small *r* is 60% this is 80%.

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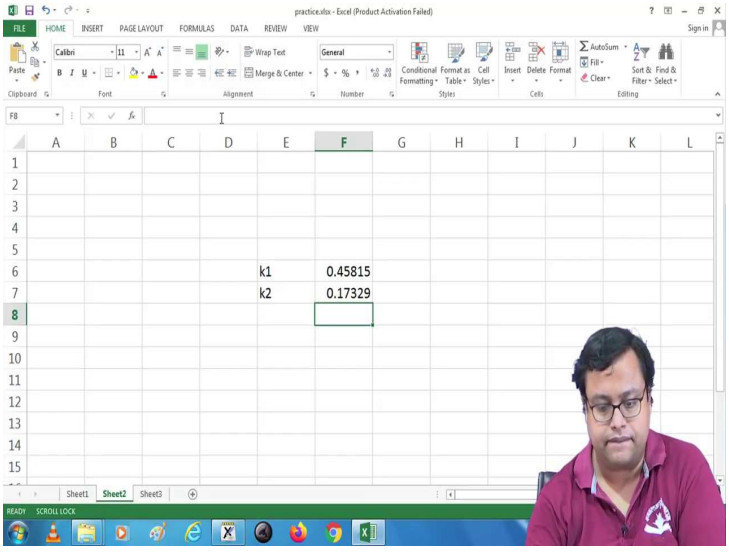

So, *0.6 by 0.8*, these are the two values. So, this value is correct this 0.17329, I have written it here.

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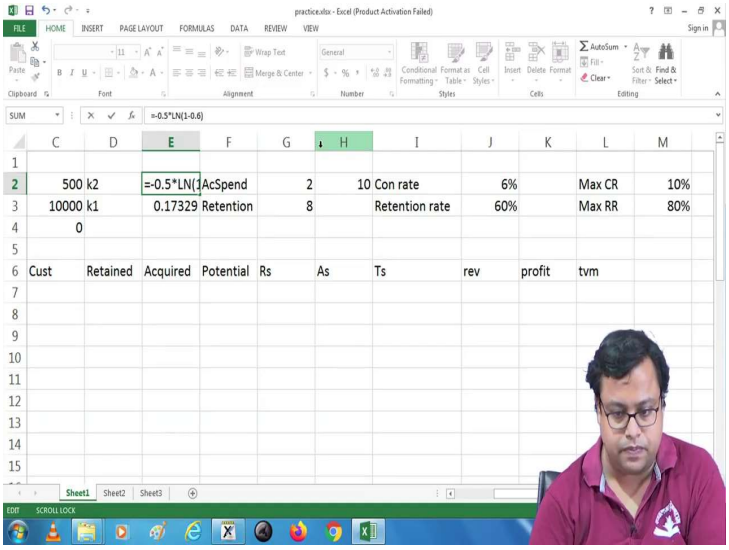

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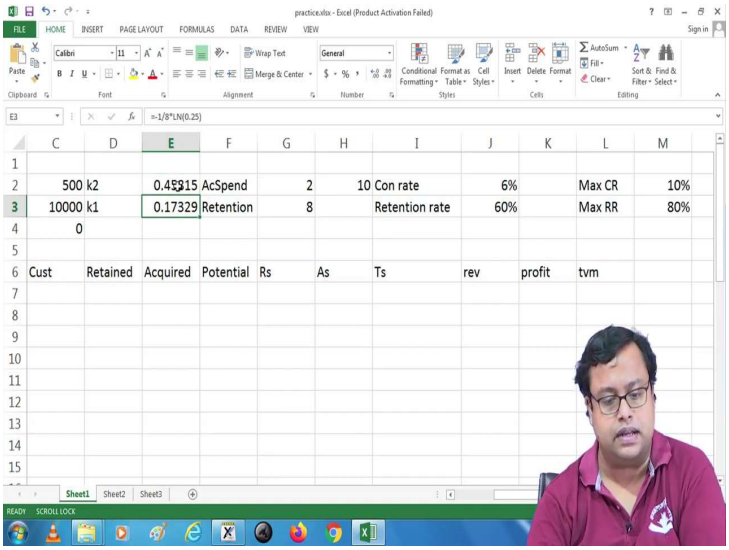

This value will be basically not LN, this will be *1 minus* and here it will be 0.5 into right; that will be the value, k1 and k2. So, k1 and k2 I have got these two values fair enough.

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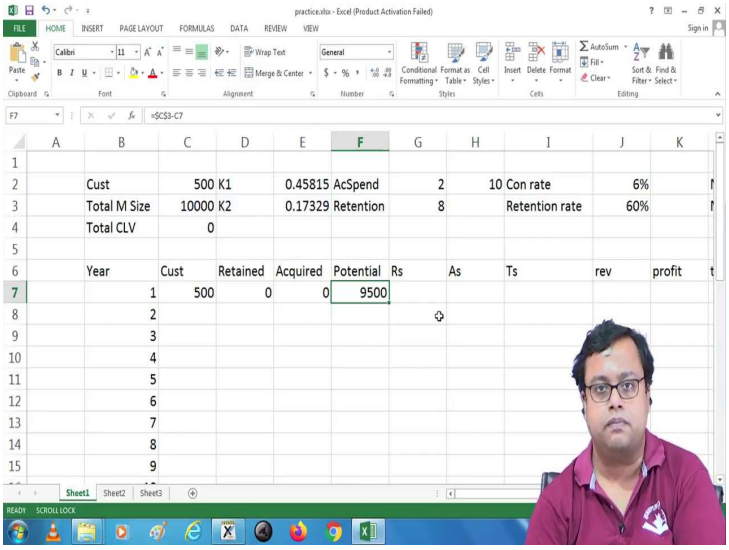

So, 1 is for, first one K1 is for retention and K2 okay. So, I have done it wrong. So, K1 and K2; the first one this K1 is for acquisition and second one is for retention. These are the two values that I have got. Then what is my acquisition spent initially? If it is 2, if I spent 2 dollars initially.

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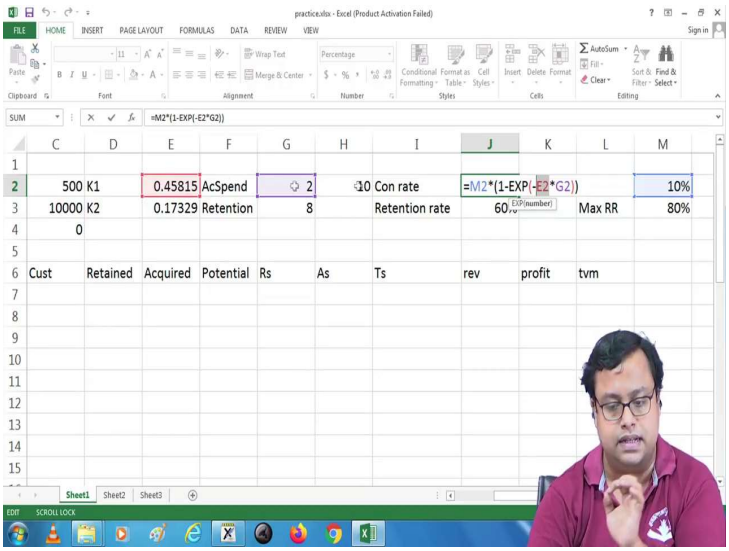

Then what will be my conversion ratio my conversion ratio is the maximum acquisition rate which is M2. The maximum acquisition rate which is *M2 minus 1 minus E2 which is the k1 basically into G2* which is the acquisition spent, that is what I get.

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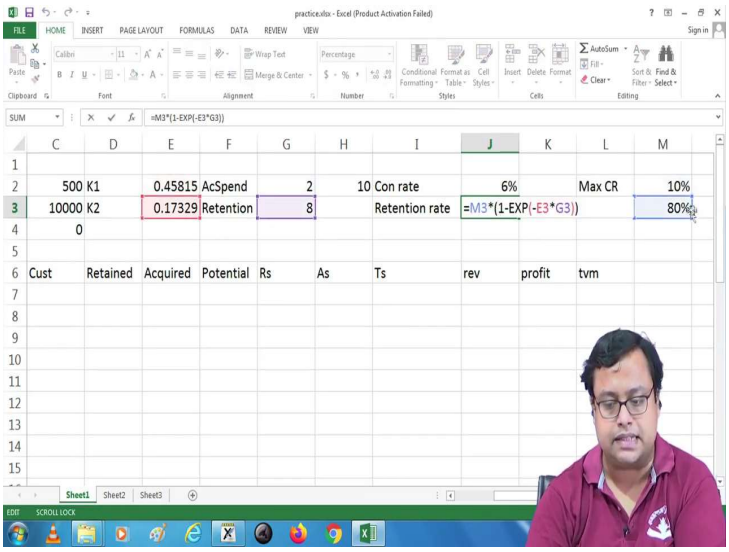

Similarly, my retention is the maximum thing which is *M3 into 1 minus exponential of minus E3*; *E3 is this one into G3 which is the K2 into retention retention expenditure*. So, this is the retention rate that I got, fair enough. Along with this, it has been also told to me that each guy whom I acquire pays 50 dollars each customer pays 50 dollars per time period or in this case per month. This has been told.

So, I spend 8 dollar for retention, but they spend 50 dollar in the business. So, now, what is my total CLV? So, first time period I have 500 customers. None are retain, none are acquired. So, basically *this minus 500* and I will put a F4 here, this is my total number of potential customers. How much is the retentions spent? This into my retention spent and I put a '*F4* 'here.

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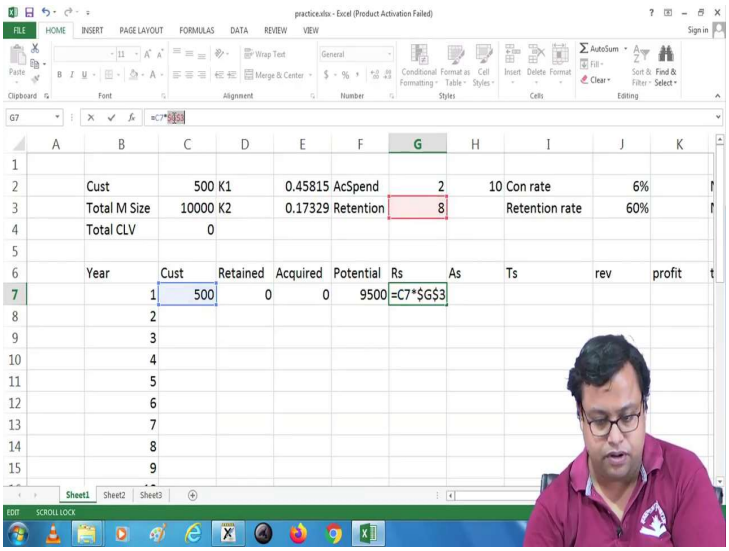

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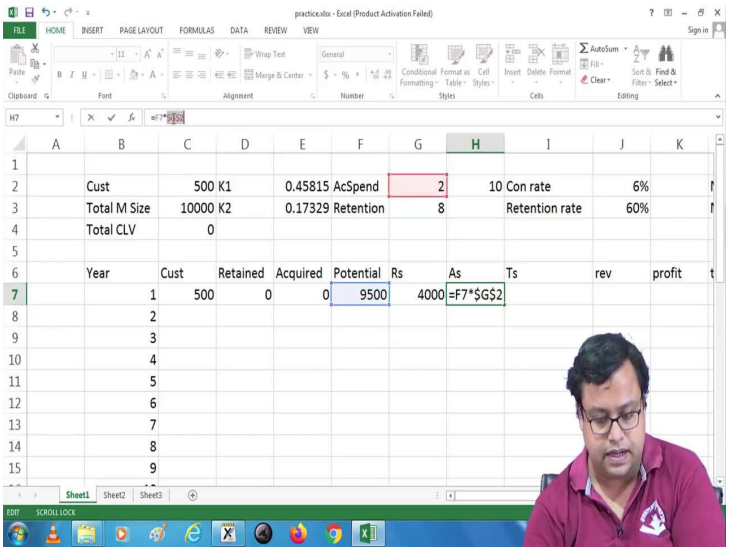

How much is the acquisition spent? This is my potential customers, each customer I paid 2 dollar.

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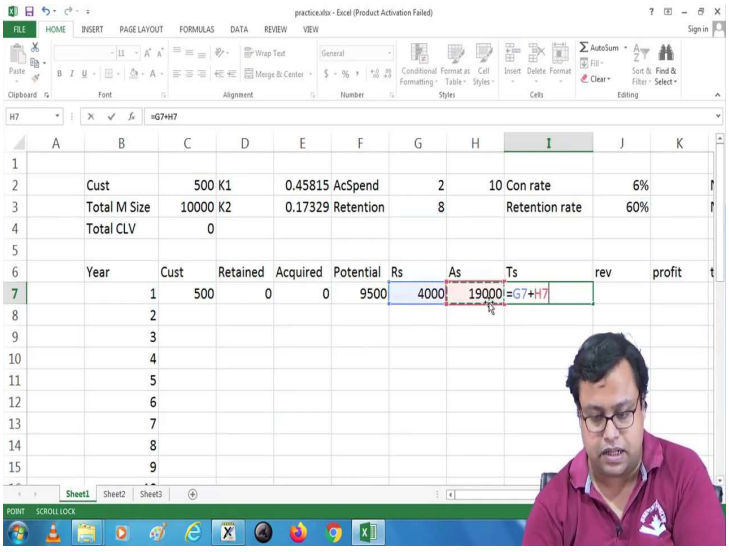

So, that is my, this two are randomly taken this two I randomly taken total is 10. This two are randomly taken. So, this is my acquisition spent that this thing is this plus this this is my total expenditure.

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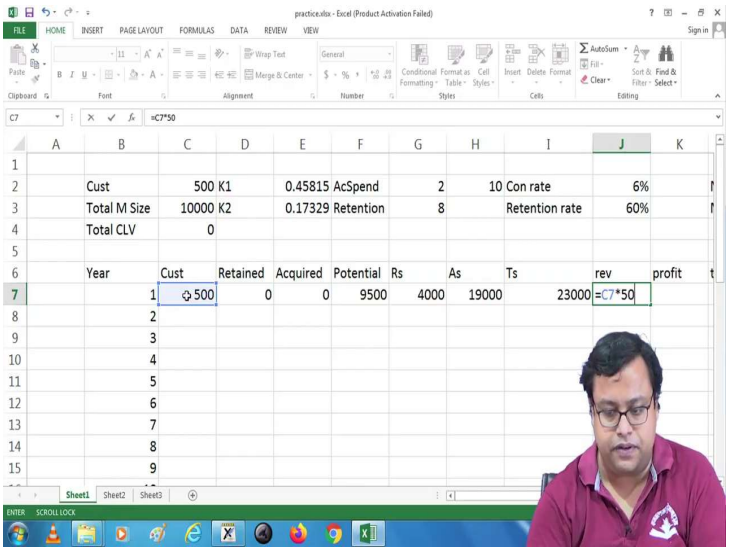

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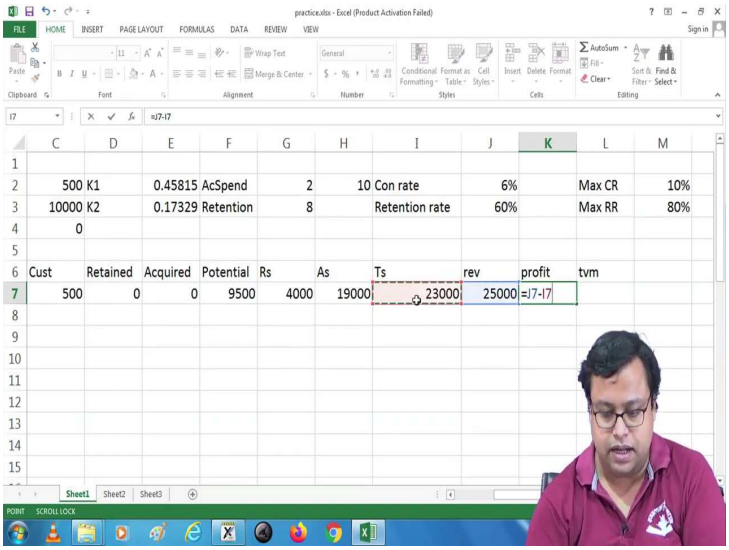

What is my revenue? My revenue is 500 customers into 50; that is my revenue. So, what is my profit? My profit is: *revenue minus the total expenditure* and what is the time value of money?

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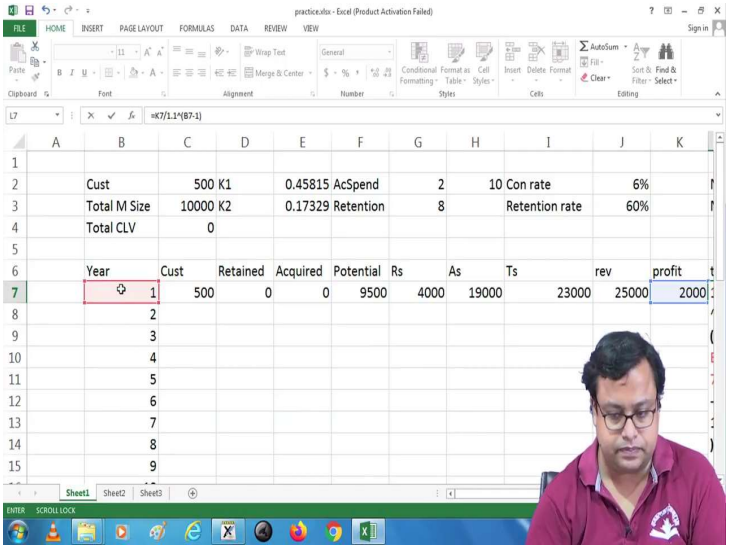

This time value of money is Let's say, if I 10% time value of money. This is *this divided by 1.1 to the power*; in the first case it is **0** and second case onwards it will go on. So, I will just write *this minus **1*** . So, the first case it will be the same value.

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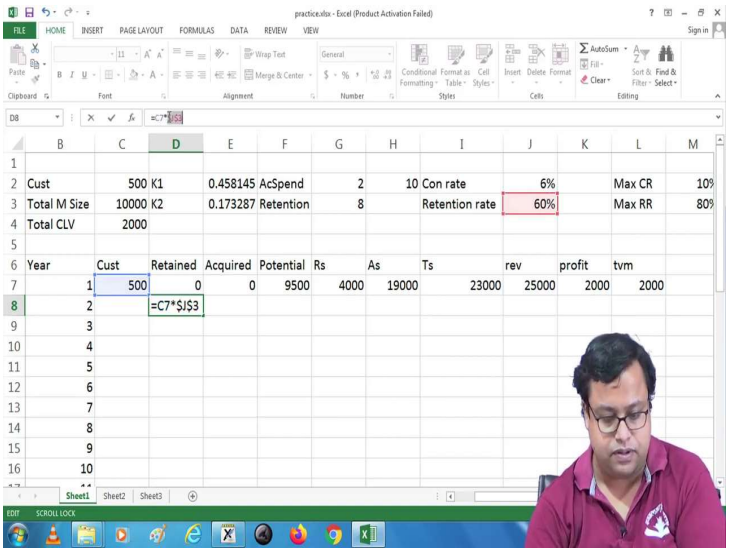

So, just check what I, did I did it quickly you should pause the video and slowly do it. Now what happens in the next time period? In the next time periodout of this 500 people, how many gets retained? This many people get retained. So, I put a F4 sign here.

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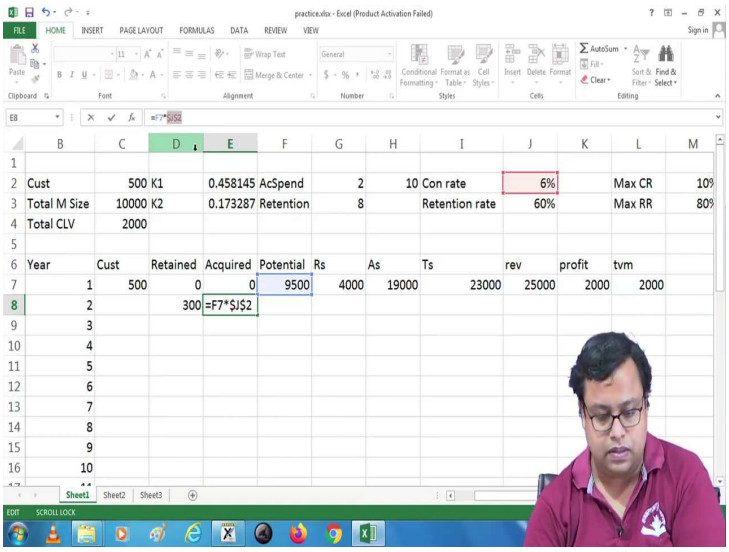

So, 300 get retained out of this 500 people and how many do I acquire more? *This into the conversion ratio*, these many customers I acquired new in this particular thing.

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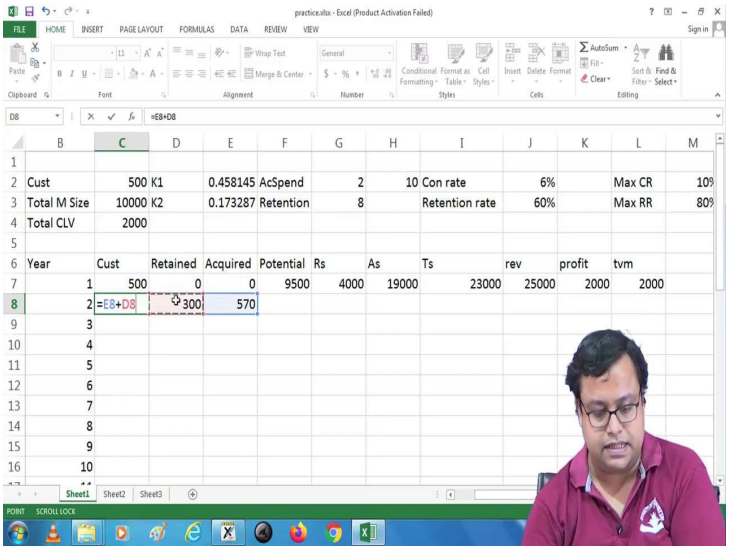

So, these are the new acquired customer, this is the retained customer. So, the new customer in the next time period *is this plus this* and basically the potential customer left after time period two is these many fair enough.

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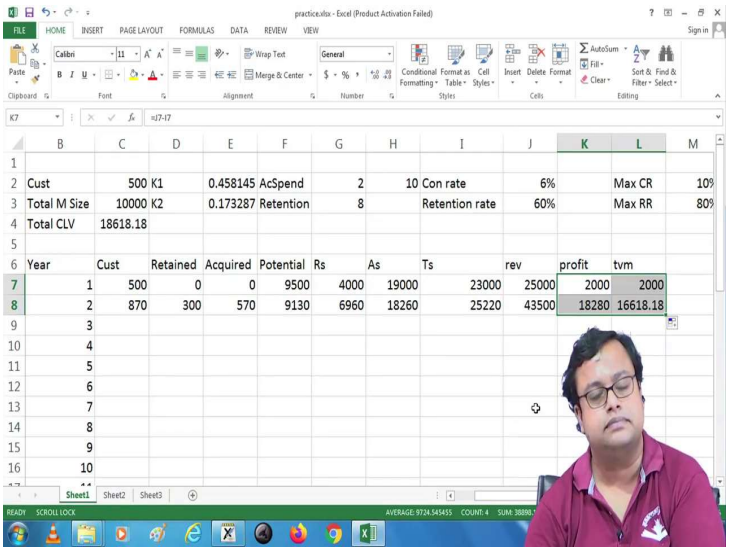

So, this many is my customers who I am got from the potential customer base these many is the customer whom I could retain. *So, put a new customer plus old customer get the total customer*. All, all potential market size minus the total customer creates my next period's potential customer. So, that is how thus things change. How much is the retention spent? The retention spent in this time period is I spend on this 870 people 8 dollars.

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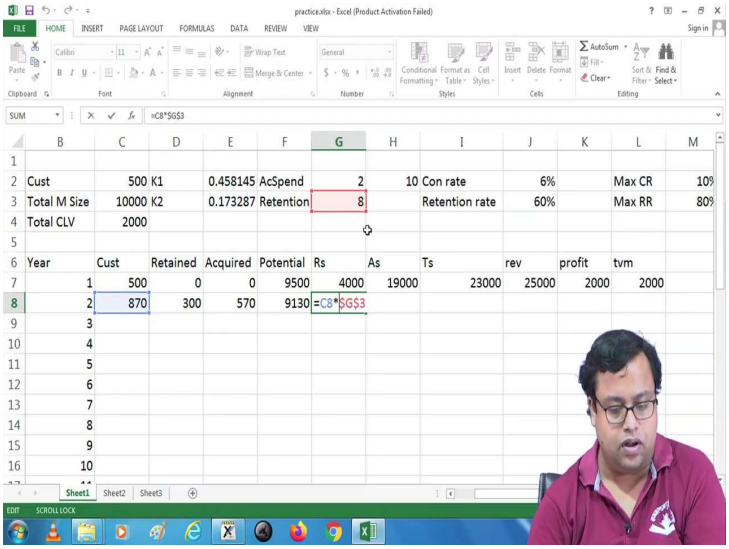

So, retention spend is *this into 8 and* on these 9130 people I spend 2 dollars. So, this my total spent, this is my total expenditure, revenue and time value of money. And specifically, I decided that I will do it for 30 years your choice after some period it is a, it is basically mark of chain if you do well marketing analysis you will understand.

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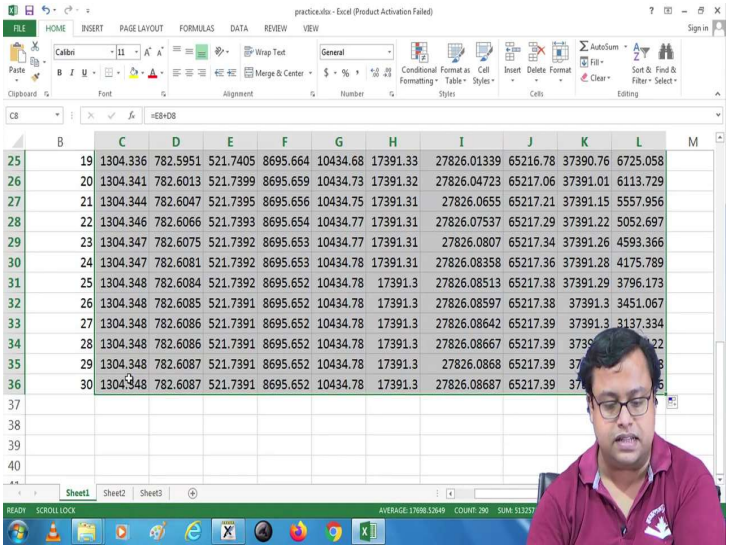

So, so after one point of time it will basically saturate. So, I will go on after 30 years you will see last values are all same, all rows are same almost.

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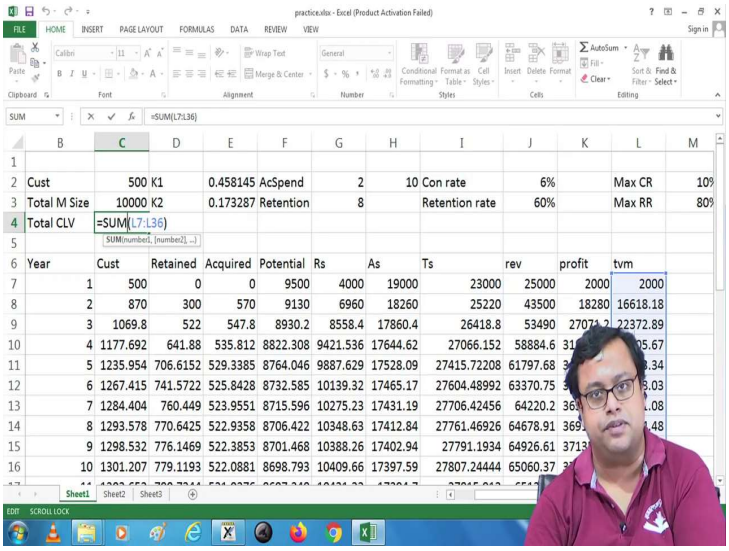

So, it saturates at some point of time and that gives me the total CLV it's nothing but the summation of the time value of money and I get this 318214.5.

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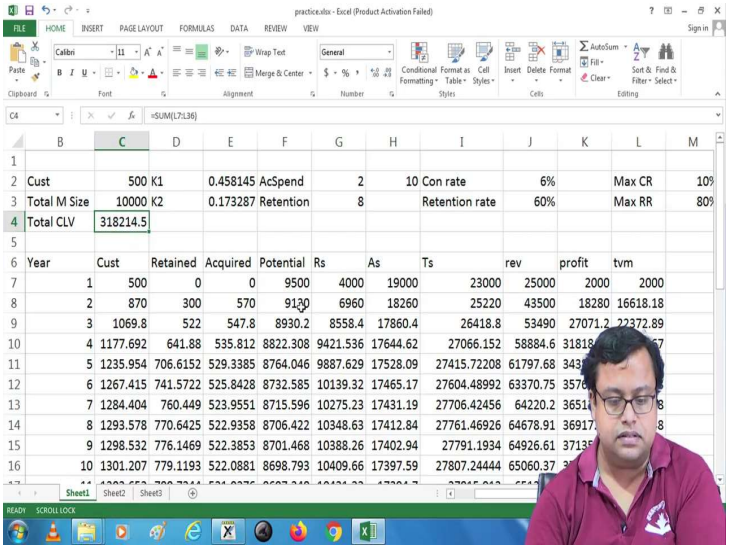

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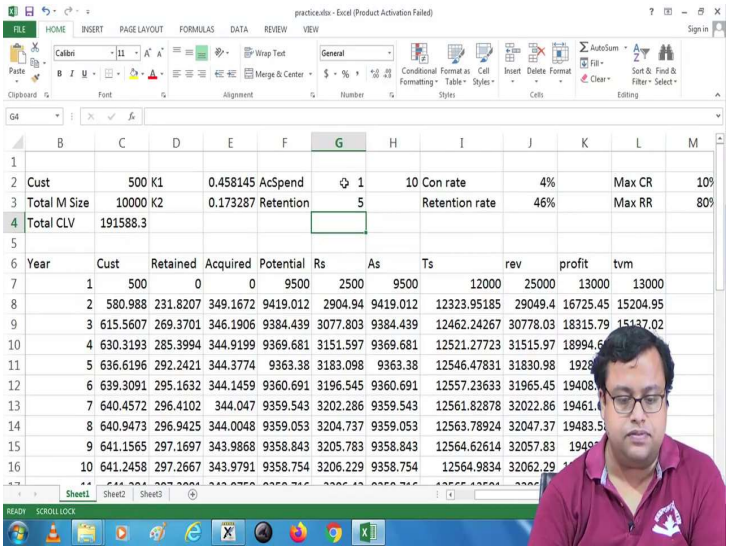

Now this value is not the fixed value, if I just change these to 1 and 5, this value changes if I change it to 20 and 30, this value changes.

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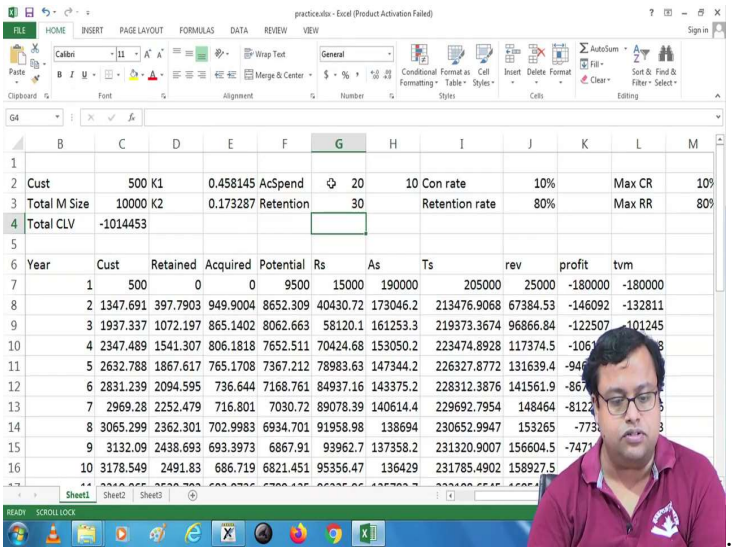

I start making losses because I spend a lot than making money, but anyway this value changes. So, let's what I will do next is how I can change these two expenditure by making sure that this particular let's say total CLV this total CLV maximizes. So, what I will do is, I will go to the solver, oh I do not have solver here. So, just one minute. So, if I do not have solver do not worry I will go to options.

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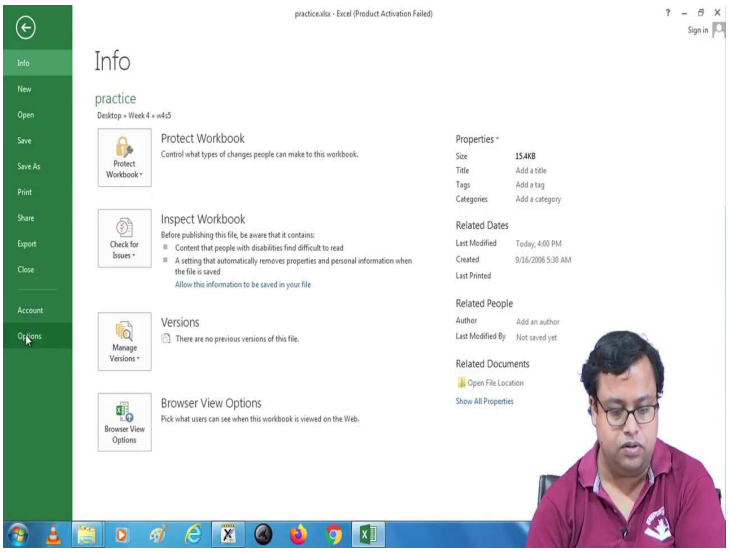

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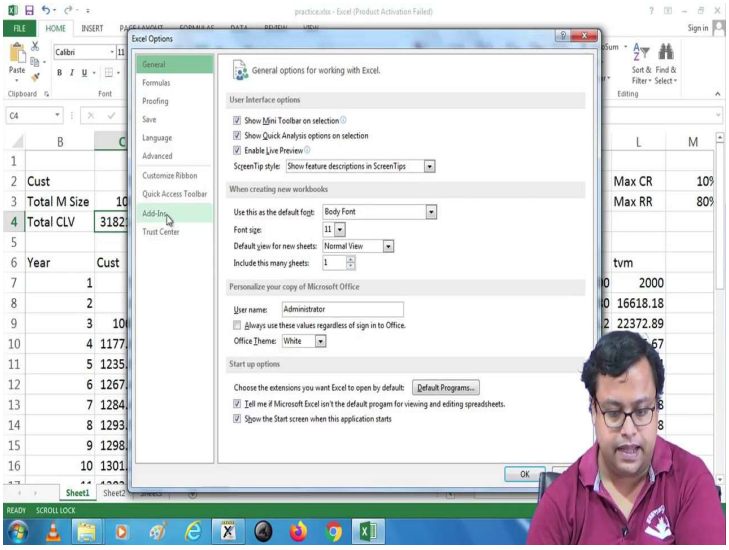

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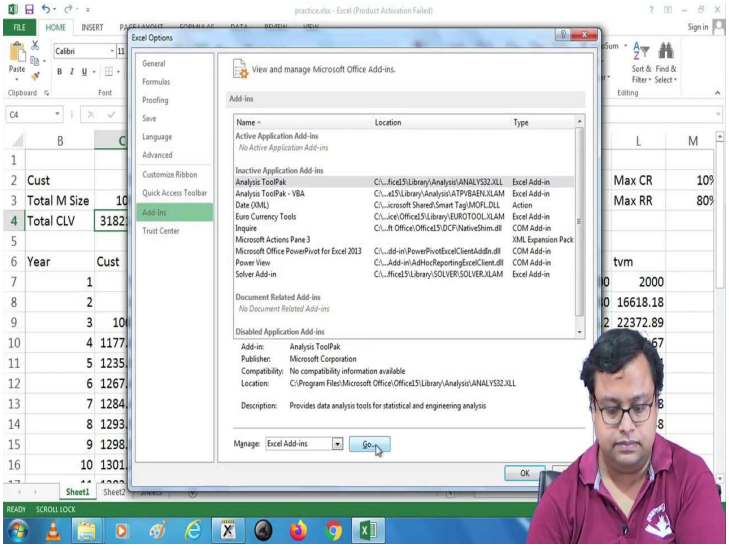

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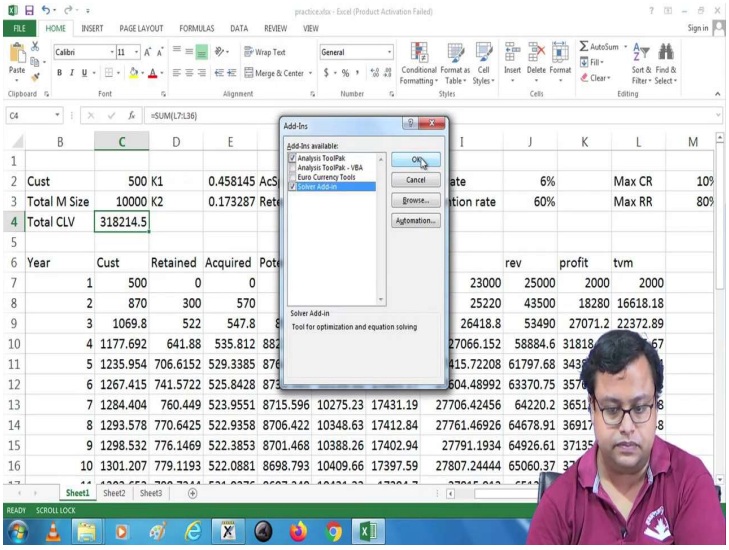

Add-Ins excel Add-Ins and I will just check the solver ok.

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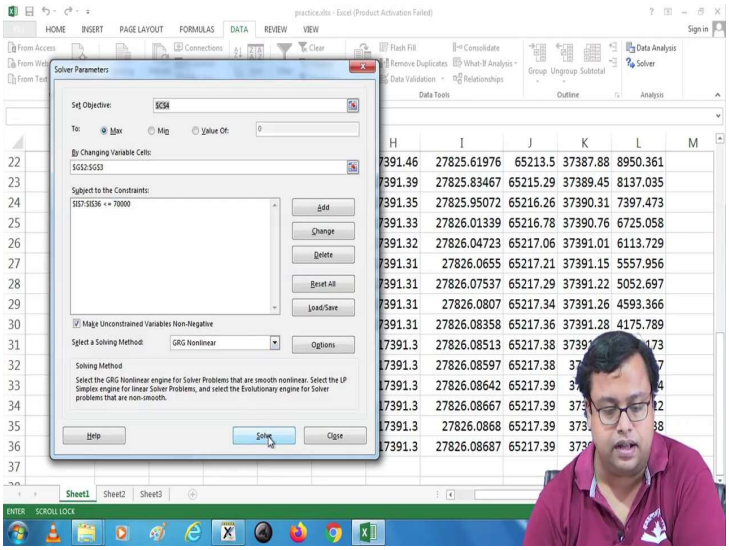

So, in the solver what I am doing you carefully check it is written that the objective function here it is written is C4. So, C4 is this basically this is total CLV. I am maximizing this by changing G2 and G3 which is these two: 2 and 8 these two things. And I am making sure that every year I7 to I36, every year I do not spend more than 70000 dollar. So, that is something that I am putting myself in a constraint.

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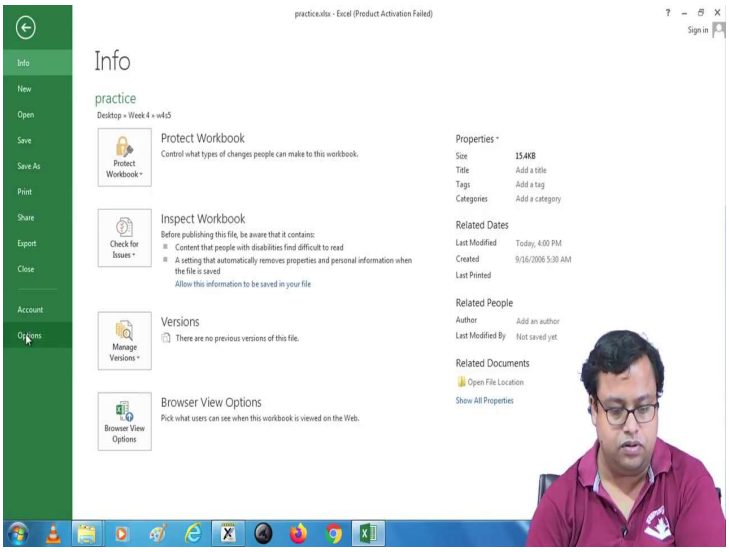

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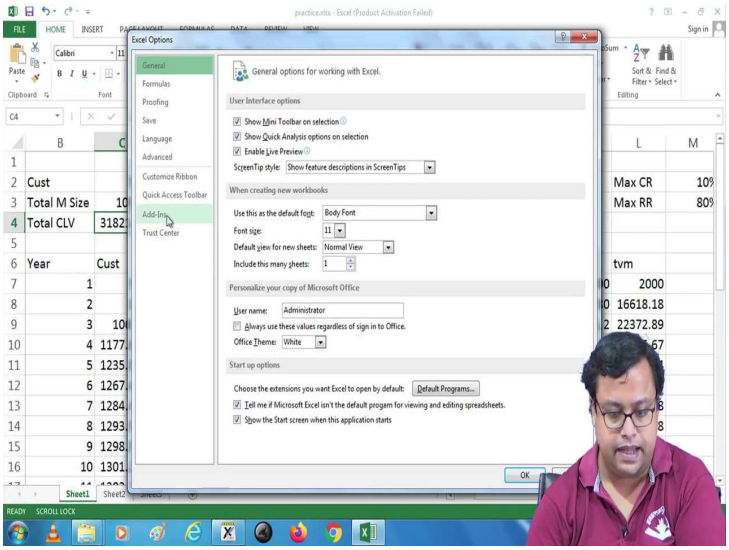

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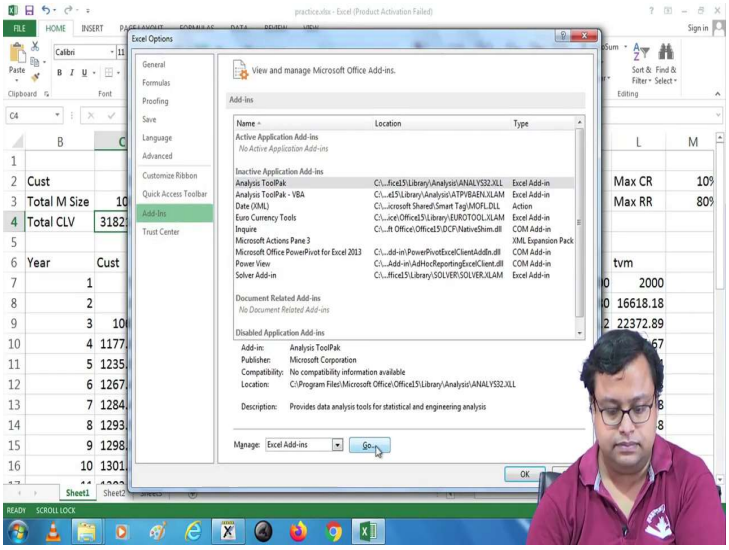

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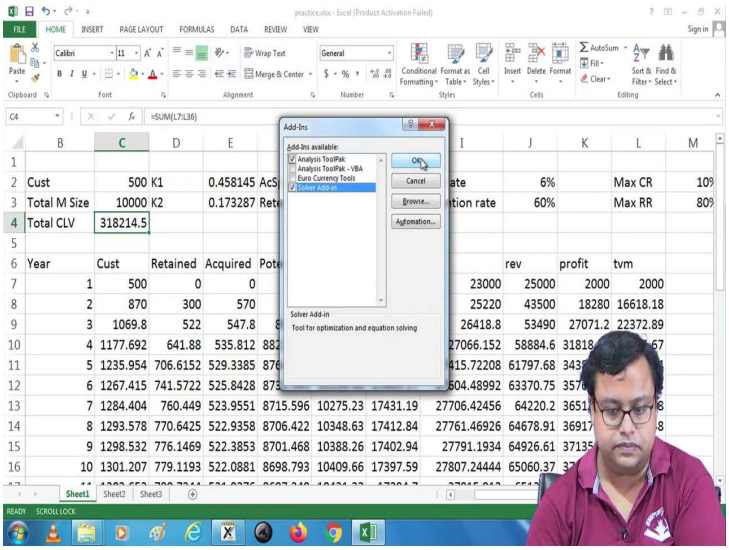

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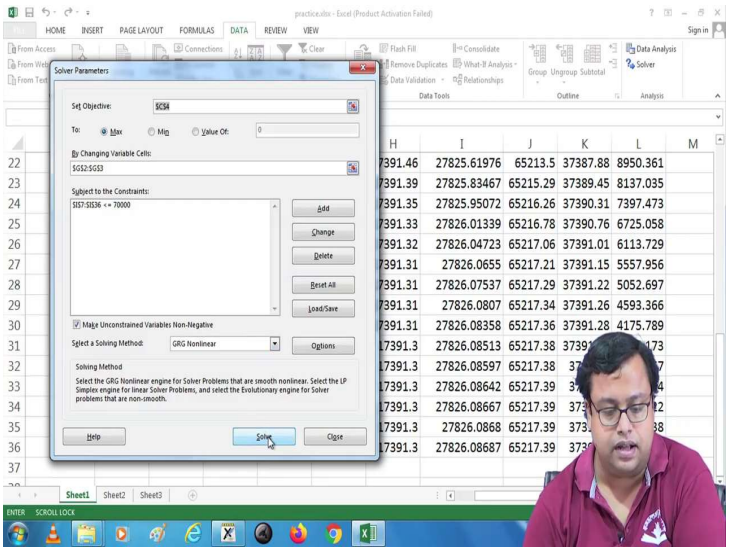

Now use GRG Nonlinear and try to solve and it found a solution for me and the solution is spend this much money. And you will see that it is asking me to spend more on retention though the retention customers are low. It is saying that spend more on your existing customer than your potential customer. The chances of they coming back is much lower that. So, how much more? 5 times more; you spend 5 times more to on your existing customer than 3 than something to your potential customer.

That will ultimately give you better total CLV or basically customer equity. So, this is how if the life is limited, if I am doing it for 30 years rather than 100 years using excel we can easily find out how much should be our optimal acquisition spend and optimal retention spend in the context of customer relationship management. Thank you very much for being with me. It was a nice discussion and I will see you in the next video.

Thank you.