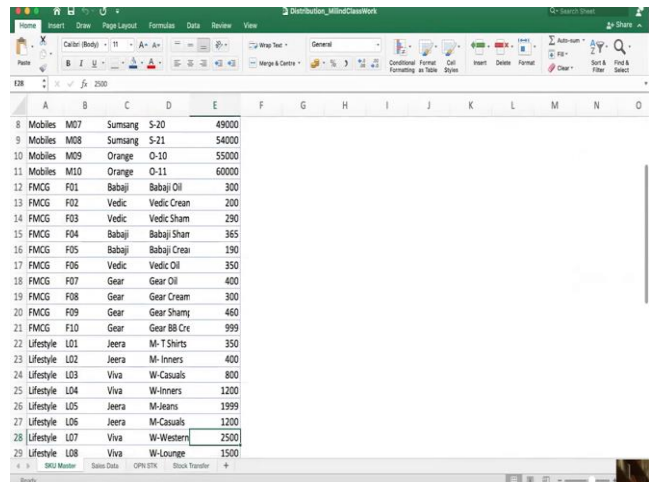


Business Data Management
Professor G Venkatesh
Doctor Milind Gandhe
Department of Humanities and Social Sciences
Indian Institute of Technology Madras
Lecture 5
Pareto Analysis I

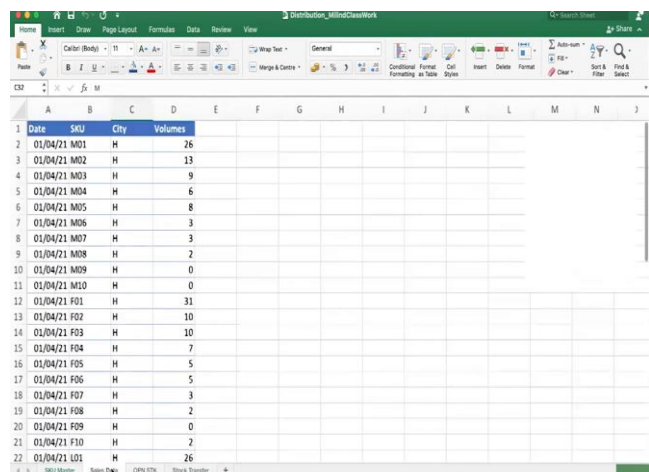
(Refer Slide Time: 0:14)



	A	B	C	D	E
8	Mobiles	M07	Samsung	S-20	49000
9	Mobiles	M08	Samsung	S-21	54000
10	Mobiles	M09	Orange	O-10	55000
11	Mobiles	M10	Orange	O-11	60000
12	FMCG	F01	Babaji	Babaji Oil	300
13	FMCG	F02	Vedic	Vedic Cream	200
14	FMCG	F03	Vedic	Vedic Sham	250
15	FMCG	F04	Babaji	Babaji Sham	365
16	FMCG	F05	Babaji	Babaji Cream	190
17	FMCG	F06	Vedic	Vedic Oil	350
18	FMCG	F07	Gear	Gear Oil	400
19	FMCG	F08	Gear	Gear Cream	300
20	FMCG	F09	Gear	Gear Sham	460
21	FMCG	F10	Gear	Gear SS Cre	999
22	Lifestyle	L01	Jeera	M-T Shirts	350
23	Lifestyle	L02	Jeera	M-Inners	400
24	Lifestyle	L03	Viva	W-Casuals	800
25	Lifestyle	L04	Viva	W-Inners	1200
26	Lifestyle	L05	Jeera	M-Jeans	1999
27	Lifestyle	L06	Jeera	M-Casuals	1200
28	Lifestyle	L07	Viva	W-Western	2500
29	Lifestyle	L08	Viva	W-Lounge	1500

Professor Milind Gandhe: So, the first thing we need to do is to look at...

(Refer Slide Time: 0:21)



	A	B	C	D	E
1	Date	SKU	City	Volumes	
2	01/04/21	M01	H		26
3	01/04/21	M02	H		13
4	01/04/21	M03	H		9
5	01/04/21	M04	H		6
6	01/04/21	M05	H		8
7	01/04/21	M06	H		3
8	01/04/21	M07	H		3
9	01/04/21	M08	H		2
10	01/04/21	M09	H		0
11	01/04/21	M10	H		0
12	01/04/21	F01	H		31
13	01/04/21	F02	H		10
14	01/04/21	F03	H		10
15	01/04/21	F04	H		7
16	01/04/21	F05	H		5
17	01/04/21	F06	H		5
18	01/04/21	F07	H		3
19	01/04/21	F08	H		2
20	01/04/21	F09	H		0
21	01/04/21	F10	H		2
22	01/04/21	L01	H		26

Professor G Venkatesh: Which one is producing more revenue is I thought that is first one.

Professor Milind Gandhe: Yes.

Professor G Venkatesh: More volume unit volume and volume which one is producing the highest volume?

Professor Milind Gandhe: Before that I think G V what we said is we have to look at which is, how do we, first we have to compute revenue for each day. Because that data is not given to us.

Professor G Venkatesh: We have to compute the volume per day, volume per day also we have to compute, that also is not given to us.

Professor Milind Gandhe: Volume per day is given for a given city.

Professor G Venkatesh: So, we have to add all the cities.

Professor Milind Gandhe: That we will do. I think, but before that at each city and each SKU level, we need to compute what is the revenue that we are getting from that SKU, from that city, on that day?

Professor G Venkatesh: Alright. Okay. Add a column I guess. So revenues.

(Refer Slide Time: 1:20)

The screenshot displays an Excel spreadsheet titled 'Distribution_MilindClasswork'. The spreadsheet has columns labeled A through O. Column A contains dates from 01/04/21 to 01/04/21. Column B contains SKUs (M01 to F10). Column C contains cities (H). Column D contains volumes (26, 13, 9, 6, 8, 3, 3, 2, 0, 0, 31, 10, 10, 7, 5, 5, 3, 2, 0, 2). Column E contains prices (26, 13, 9, 6, 8, 3, 3, 2, 0, 0, 31, 10, 10, 7, 5, 5, 3, 2, 0, 2). The formula bar shows the formula =VLOOKUP(12, ... used in cell E2. A small video inset in the bottom right corner shows Prof G Venkatesh.

Professor Milind Gandhe: Before we compute to the revenue, we will need to figure out what is the price?

Professor G Venkatesh: Price is there in the mass size.

Professor Milind Gandhe: So, the first thing we need to do is to do a VLOOKUP. So, what we need to do G V is we first need to look up the prices. And I think the best way to look at

the price is to do VLOOKUP. So what will VLOOKUP do, VLOOKUP will allow us to look up the price of a given SKU based on some other table.

Professor G Venkatesh: So we are looking at a key in a table. So the key is in this case, SKU M01 is the key?

Professor Milind Gandhe: Yes. So that would be in cell B2. And the data is here in the SKU master sheet.

Professor G Venkatesh: So you have to go to the master sheet.

(Refer Slide Time: 2:08)

BU	SKU	Brand	Model	Avg Price
Mobiles	M01	RealU	RU-10	12000
Mobiles	M02	RealU	RU-9 Plus	
Mobiles	M03	YouM	YM-99	16000
Mobiles	M04	YouM	YM-99 Plus	20000
Mobiles	M05	YouM	YM-98	8000
Mobiles	M06	RealU	RU-9	8000
Mobiles	M07	SumSang	S-20	49000
Mobiles	M08	SumSang	S-21	54000
Mobiles	M09	Orange	O-10	55000
Mobiles	M10	Orange	O-11	60000
FMCG	F01	Babaji	Babaji Oil	300
FMCG	F02	Vedic	Vedic Cream	200
FMCG	F03	Vedic	Vedic Sham	290
FMCG	F04	Babaji	Babaji Sham	365
FMCG	F05	Babaji	Babaji Cream	190
FMCG	F06	Vedic	Vedic Oil	350
FMCG	F07	Gear	Gear Oil	400
FMCG	F08	Gear	Gear Cream	300
FMCG	F09	Gear	Gear Sham	460
FMCG	F10	Gear	Gear 88 Cre	999
Lifestyle	L01	Jeans	MA-T Shirts	350

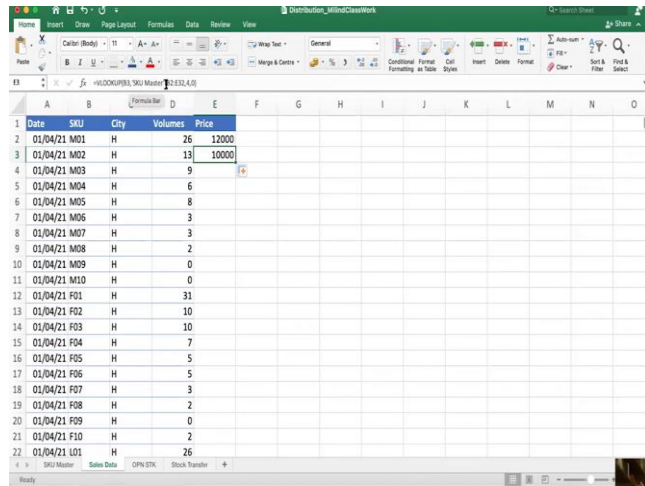
Professor Milind Gandhe: So we will pick up from column B to column E. This entire four columns we pick up, out of that we want to look at the fourth column. Because that is where the price is.

Professor G Venkatesh: Because the B is the first column, C is the second column, D is the third column, E is the fourth column that you are saying. E is the fourth column.

Professor Milind Gandhe: B has the key which we are going to look up... C is the second, D is the third and E is the fourth. And then we want an exact match. We do not want an approximate match. By default, Excel or Google Sheets any of these will look at an approximate match. But in our case, we want an exact match. So for that, we have to say 0 the fourth parameter has to be 0.

(Refer Slide Time: 3:08)

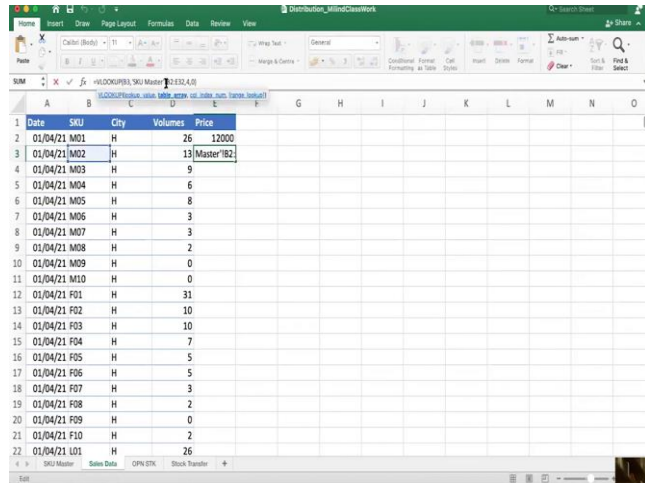
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Date	SKU	City	Volumes	Price
01/04/21	M01	H	26	12000
01/04/21	M02	H	13	10000
01/04/21	M03	H	9	
01/04/21	M04	H	6	
01/04/21	M05	H	8	
01/04/21	M06	H	3	
01/04/21	M07	H	3	
01/04/21	M08	H	2	
01/04/21	M09	H	0	
01/04/21	M10	H	0	
01/04/21	F01	H	31	
01/04/21	F02	H	10	
01/04/21	F03	H	10	
01/04/21	F04	H	7	
01/04/21	F05	H	5	
01/04/21	F06	H	5	
01/04/21	F07	H	3	
01/04/21	F08	H	2	
01/04/21	F09	H	0	
01/04/21	F10	H	2	
01/04/21	L01	H	26	

Mind Gandhi

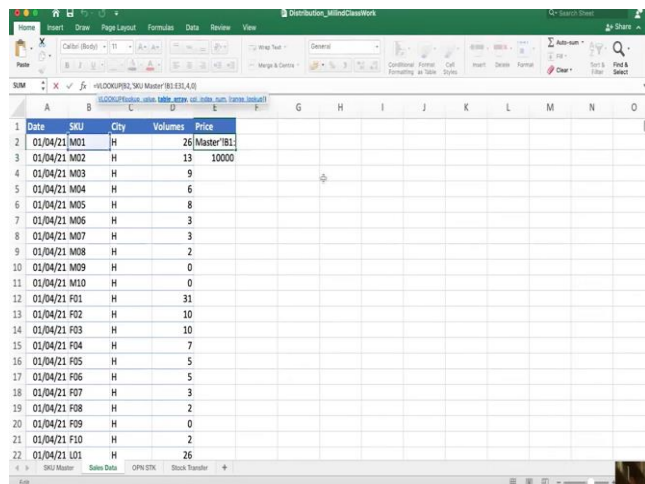
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Date	SKU	City	Volumes	Price
01/04/21	M01	H	26	12000
01/04/21	M02	H	13	Master!B2
01/04/21	M03	H	9	
01/04/21	M04	H	6	
01/04/21	M05	H	8	
01/04/21	M06	H	3	
01/04/21	M07	H	3	
01/04/21	M08	H	2	
01/04/21	M09	H	0	
01/04/21	M10	H	0	
01/04/21	F01	H	31	
01/04/21	F02	H	10	
01/04/21	F03	H	10	
01/04/21	F04	H	7	
01/04/21	F05	H	5	
01/04/21	F06	H	5	
01/04/21	F07	H	3	
01/04/21	F08	H	2	
01/04/21	F09	H	0	
01/04/21	F10	H	2	
01/04/21	L01	H	26	

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Date	SKU	City	Volumes	Price
01/04/21	M01	H	26	Master!B1
01/04/21	M02	H	13	10000
01/04/21	M03	H	9	
01/04/21	M04	H	6	
01/04/21	M05	H	8	
01/04/21	M06	H	3	
01/04/21	M07	H	3	
01/04/21	M08	H	2	
01/04/21	M09	H	0	
01/04/21	M10	H	0	
01/04/21	F01	H	31	
01/04/21	F02	H	10	
01/04/21	F03	H	10	
01/04/21	F04	H	7	
01/04/21	F05	H	5	
01/04/21	F06	H	5	
01/04/21	F07	H	3	
01/04/21	F08	H	2	
01/04/21	F09	H	0	
01/04/21	F10	H	2	
01/04/21	L01	H	26	

Mind Gandhi

Now the only one thing as a good practice GV.

Professor G Venkatesh: Wait a second before you go to the good practice this 12,000, what is 12,000? 26 multiplied...

Professor Milind Gandhe: It is the price of one unit of M01.

Professor G Venkatesh: Of course, one unit, correct.

Professor Milind Gandhe: One unit, this is the price. Now, our students will remember from the Excel introduction, that Excel will allow you to do relative addressing and reference addressing. So what is a relative addressing? Let me show you. So here. For example, we say we will look up B2. And in the SKU master we will look at the table B1 to E31. Now, let us try and see what happens when we copy the formula.

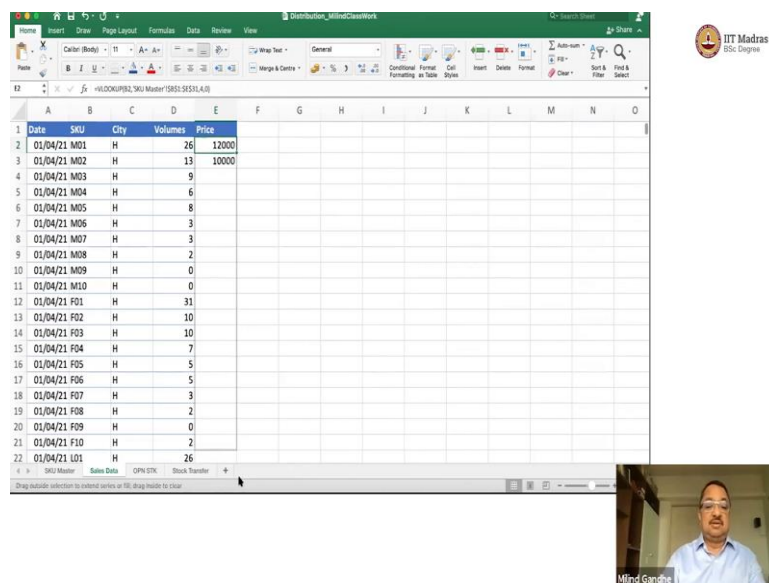
Professor G Venkatesh: It will change it from B1 it will go to B2.

Professor Milind Gandhe: So the SKU that we are looking up is now cell B3, which is correct, which is what we want. But actually it is looking it up from the wrong table.

Professor G Venkatesh: Correct, it should look from B1 to E31 again.

Professor Milind Gandhe: So if you look up... So it is preferred in this first formula we should put dollar dollar. So this is called reference addressing.

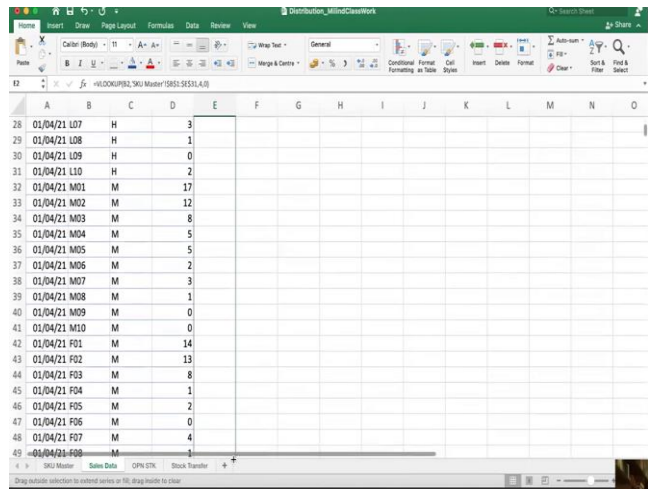
(Refer Slide Time: 4:41)



The screenshot displays an Excel spreadsheet titled 'Distribution_MilindClassroom'. The active sheet is 'SKU Master' with the formula bar showing '=LOOKUP(B2,SKU Master!\$B\$1:\$E\$31,A)'. The table data is as follows:

	Date	SKU	City	Volumes	Price
2	01/04/21	M01	H	26	12000
3	01/04/21	M02	H	13	10000
4	01/04/21	M03	H	9	
5	01/04/21	M04	H	6	
6	01/04/21	M05	H	8	
7	01/04/21	M06	H	3	
8	01/04/21	M07	H	3	
9	01/04/21	M08	H	2	
10	01/04/21	M09	H	0	
11	01/04/21	M10	H	0	
12	01/04/21	F01	H	31	
13	01/04/21	F02	H	10	
14	01/04/21	F03	H	10	
15	01/04/21	F04	H	7	
16	01/04/21	F05	H	5	
17	01/04/21	F06	H	5	
18	01/04/21	F07	H	3	
19	01/04/21	F08	H	2	
20	01/04/21	F09	H	0	
21	01/04/21	F10	H	2	
22	01/04/21	L01	H	26	

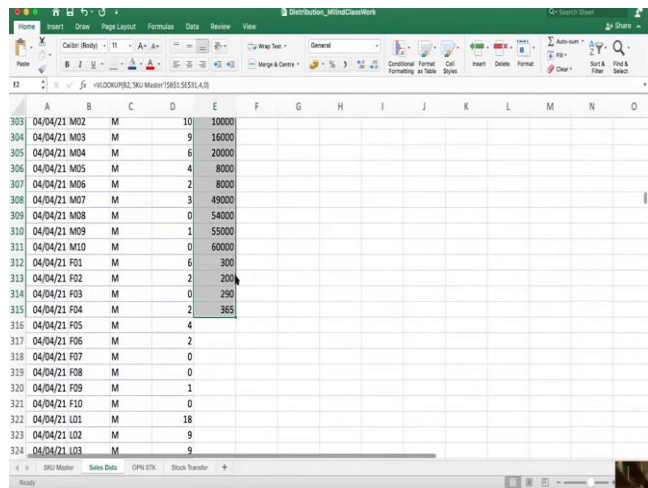
A video inset in the bottom right corner shows Professor Milind Gandhe.



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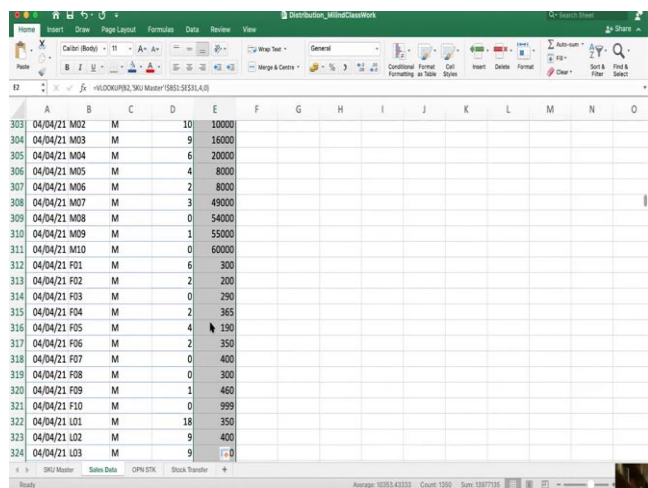
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
28	01/04/21	L07	H		3										
29	01/04/21	L08	H		1										
30	01/04/21	L09	H		0										
31	01/04/21	L10	H		2										
32	01/04/21	M01	M		17										
33	01/04/21	M02	M		12										
34	01/04/21	M03	M		8										
35	01/04/21	M04	M		5										
36	01/04/21	M05	M		5										
37	01/04/21	M06	M		2										
38	01/04/21	M07	M		3										
39	01/04/21	M08	M		1										
40	01/04/21	M09	M		0										
41	01/04/21	M10	M		0										
42	01/04/21	F01	M		14										
43	01/04/21	F02	M		13										
44	01/04/21	F03	M		8										
45	01/04/21	F04	M		1										
46	01/04/21	F05	M		2										
47	01/04/21	F06	M		0										
48	01/04/21	F07	M		4										
49	01/04/21	F08	M		1										



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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
303	04/04/21	M02	M	10	10000										
304	04/04/21	M03	M	9	16000										
305	04/04/21	M04	M	6	20000										
306	04/04/21	M05	M	4	8000										
307	04/04/21	M06	M	2	8000										
308	04/04/21	M07	M	3	49000										
309	04/04/21	M08	M	0	54000										
310	04/04/21	M09	M	1	55000										
311	04/04/21	M10	M	0	60000										
312	04/04/21	F01	M	6	300										
313	04/04/21	F02	M	2	200										
314	04/04/21	F03	M	0	290										
315	04/04/21	F04	M	2	365										
316	04/04/21	F05	M	4											
317	04/04/21	F06	M	2											
318	04/04/21	F07	M	0											
319	04/04/21	F08	M	0											
320	04/04/21	F09	M	1											
321	04/04/21	F10	M	0											
322	04/04/21	L01	M	18											
323	04/04/21	L02	M	9											
324	04/04/21	L03	M	9											



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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
303	04/04/21	M02	M	10	10000										
304	04/04/21	M03	M	9	16000										
305	04/04/21	M04	M	6	20000										
306	04/04/21	M05	M	4	8000										
307	04/04/21	M06	M	2	8000										
308	04/04/21	M07	M	3	49000										
309	04/04/21	M08	M	0	54000										
310	04/04/21	M09	M	1	55000										
311	04/04/21	M10	M	0	60000										
312	04/04/21	F01	M	6	300										
313	04/04/21	F02	M	2	200										
314	04/04/21	F03	M	0	290										
315	04/04/21	F04	M	2	365										
316	04/04/21	F05	M	4	190										
317	04/04/21	F06	M	2	350										
318	04/04/21	F07	M	0	400										
319	04/04/21	F08	M	0	300										
320	04/04/21	F09	M	1	460										
321	04/04/21	F10	M	0	999										
322	04/04/21	L01	M	18	350										
323	04/04/21	L02	M	9	400										
324	04/04/21	L03	M	9											

Professor Milind Gandhe: And now we can just copy this throughout.

Professor G Venkatesh: So the key thing you have learnt here is VLOOKUP, basically.

Professor Milind Gandhe: VLOOKUP and reference addressing. It is taking some time to copy but.

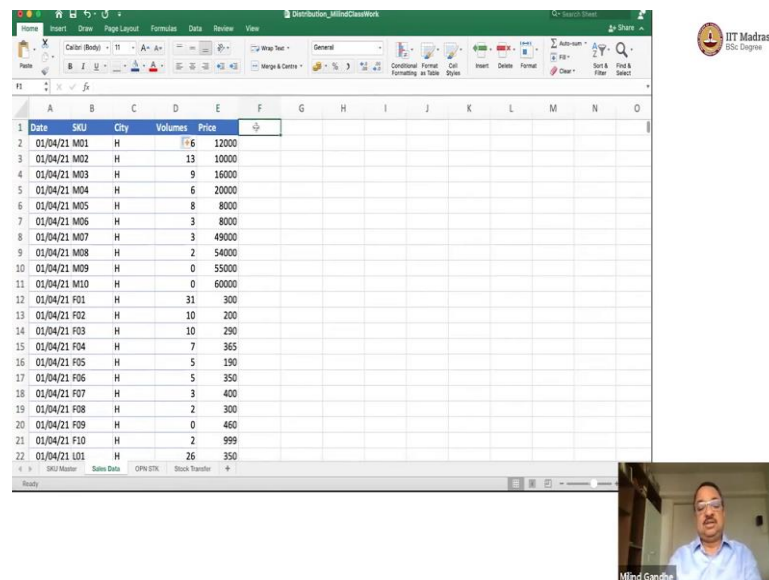
Professor G Venkatesh: There is a shortcut for this some control something is there.

Professor Milind Gandhe: Let us see.

Professor G Venkatesh: You can actually go to the end of it.

Professor Milind Gandhe: If you just double click, it selects the whole thing. And then now we have got it fully populated. You can see we have got the sheet fully populated.

(Refer Slide Time: 5:42)



The screenshot displays an Excel spreadsheet with the following data:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Date	SKU	City	Volumes	Price										
2	01/04/21	M01	H	6	12000										
3	01/04/21	M02	H	13	10000										
4	01/04/21	M03	H	9	16000										
5	01/04/21	M04	H	6	20000										
6	01/04/21	M05	H	8	8000										
7	01/04/21	M06	H	3	8000										
8	01/04/21	M07	H	3	49000										
9	01/04/21	M08	H	2	54000										
10	01/04/21	M09	H	0	55000										
11	01/04/21	M10	H	0	60000										
12	01/04/21	F01	H	31	300										
13	01/04/21	F02	H	10	200										
14	01/04/21	F03	H	10	290										
15	01/04/21	F04	H	7	965										
16	01/04/21	F05	H	5	190										
17	01/04/21	F06	H	5	350										
18	01/04/21	F07	H	3	400										
19	01/04/21	F08	H	2	300										
20	01/04/21	F09	H	0	460										
21	01/04/21	F10	H	2	999										
22	01/04/21	L01	H	26	350										

The video inset shows Professor Milind Gandhe, who is speaking during the presentation.

The screenshot displays an Excel spreadsheet titled 'Distribution_MilindClassWork'. The table has the following data:

Date	SKU	City	Volumes	Price	Revenue
01/04/21	M01	H	26	1200	₹3,12,000
01/04/21	M02	H	13	10000	₹1,30,000
01/04/21	M03	H	9	16000	₹1,44,000
01/04/21	M04	H	6	20000	₹1,20,000
01/04/21	M05	H	8	8000	₹64,000
01/04/21	M06	H	3	8000	₹24,000
01/04/21	M07	H	3	49000	₹1,47,000
01/04/21	M08	H	2	54000	₹1,08,000
01/04/21	M09	H	0	55000	₹0
01/04/21	M10	H	0	60000	₹0
01/04/21	F01	H	31	300	₹9,300
01/04/21	F02	H	10	200	₹2,000
01/04/21	F03	H	10	290	₹2,900
01/04/21	F04	H	7	365	₹2,555
01/04/21	F05	H	5	190	₹950
01/04/21	F06	H	5	350	₹1,750
01/04/21	F07	H	3	400	₹1,200
01/04/21	F08	H	2	300	₹600
01/04/21	F09	H	0	460	₹0
01/04/21	F10	H	2	999	₹1,998
01/04/21	L01	H	26	350	₹9,100

The second screenshot shows the continuation of the table:

01/04/21	F09	H	0	460	₹0
01/04/21	F10	H	2	999	₹1,998
01/04/21	L01	H	26	350	₹9,100
01/04/21	L02	H	13	400	₹5,200
01/04/21	L03	H	9	800	₹7,200
01/04/21	L04	H	7	1200	₹8,400
01/04/21	L05	H	4	1999	₹7,996
01/04/21	L06	H	2	1200	₹2,400
01/04/21	L07	H	3	2500	₹7,500
01/04/21	L08	H	1	1500	₹1,500
01/04/21	L09	H	0	1800	₹0
01/04/21	L10	H	2	3000	₹6,000
01/04/21	M01	M	17	12000	₹2,04,000
01/04/21	M02	M	12	10000	₹1,20,000
01/04/21	M03	M	8	16000	₹1,28,000
01/04/21	M04	M	5	20000	₹1,00,000
01/04/21	M05	M	5	8000	₹40,000
01/04/21	M06	M	2	8000	₹16,000
01/04/21	M07	M	3	49000	₹1,47,000
01/04/21	M08	M	1	54000	₹54,000
01/04/21	M09	M	0	55000	₹0
01/04/21	M10	M	0	60000	₹0

Professor Milind Gandhe: Now we can compute the revenue. So we will add another column which is revenue and revenue is what, what is the revenue?

Professor G Venkatesh: Price multiplied by volume.

Professor Milind Gandhe: So, we will say D3, D2 sorry into E2 i. e. (D2*E2).

Professor G Venkatesh: This we can drag, this is correct.

Professor Milind Gandhe: And this we can drag but before that G V always a good idea when we are talking about revenue to format it as currency.

Professor G Venkatesh: Because commas will come?

Professor Milind Gandhe: Yes. And then it becomes easy to read. Now, in our case, there are not going to be any paises, so we can remove the decimals. So it is now you can read it much

easier. It is 3,12,000. And then once again, I will double click and the whole row whole column got populated. Now, let us go back to the questions. So I think one of the first questions that they were asking is which SKU contributes the most?

Professor G Venkatesh: Why is M09 0? Because 0 units.

Professor Milind Gandhe: There is no unit sold.

Professor G Venkatesh: That is why. I get it.

Professor Milind Gandhe: There is no unit sold. I think that unit does not, that SKU does not seem to be moving too much. It is not selling too much.

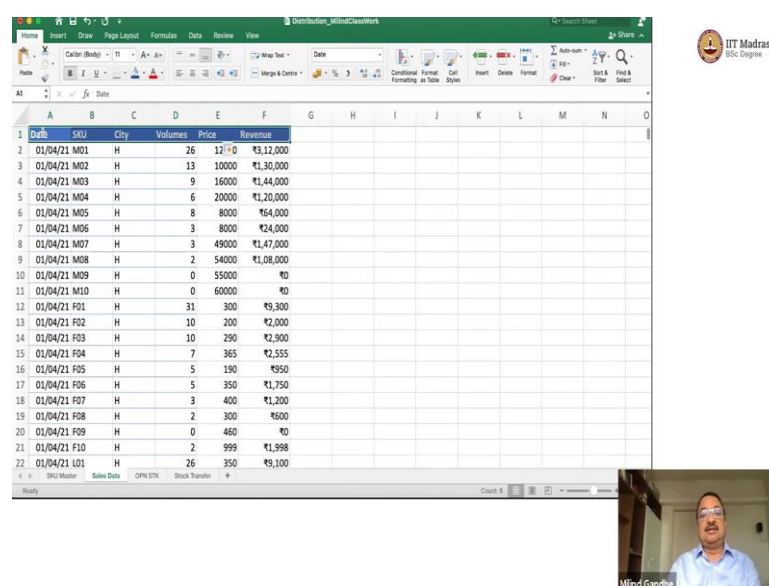
Professor G Venkatesh: We have moved on second. We do not know. We will find out.

Professor Milind Gandhe: We will find out. There is another one here F9 also I think denser. So they are some SKUs I mean they are not selling on some days. So now the next big, I think the first question now we have some data to start answering. So the first thing...

Professor G Venkatesh: We are expected to tell them which units are generating the highest volume.

Professor Milind Gandhe: Which SKU is generating the highest volume and which SKU is generating the highest revenue. So first, let us look at revenue. I think revenue is more interesting.

(Refer Slide Time: 8:20)



Date	SKU	City	Volumes	Price	Revenue
01/04/21	M01	H	26	12,000	3,12,000
01/04/21	M02	H	13	10,000	1,30,000
01/04/21	M03	H	9	16,000	1,44,000
01/04/21	M04	H	6	20,000	1,20,000
01/04/21	M05	H	8	8,000	64,000
01/04/21	M06	H	3	8,000	24,000
01/04/21	M07	H	3	49,000	1,47,000
01/04/21	M08	H	2	54,000	1,08,000
01/04/21	M09	H	0	55,000	0
01/04/21	M10	H	0	60,000	0
01/04/21	F01	H	31	300	9,300
01/04/21	F02	H	10	200	2,000
01/04/21	F03	H	10	290	2,900
01/04/21	F04	H	7	365	2,555
01/04/21	F05	H	5	190	950
01/04/21	F06	H	5	350	1,750
01/04/21	F07	H	3	400	1,200
01/04/21	F08	H	2	300	600
01/04/21	F09	H	0	460	0
01/04/21	F10	H	2	999	1,998
01/04/21	L01	H	26	350	9,100

The screenshot shows an Excel spreadsheet titled "Distribution_MilindClassWork". The data is organized in columns A through F. Column A contains SKU numbers (e.g., 1331, 1332, 1333), Column B contains dates (e.g., 15/04/21, 15/04/21), Column C contains city codes (e.g., M10, F01, F02), Column D contains quantities (e.g., 1, 16, 3), Column E contains revenue values (e.g., 60000, 300, 200), and Column F contains revenue values in Indian Rupees (e.g., ₹60,000, ₹300, ₹3,200). The spreadsheet is displayed in a window with the Excel ribbon visible at the top. In the bottom right corner, there is a small video inset showing a man, identified as Milind Gandhe, speaking.

Professor Milind Gandhe: So what we will do is we select this entire data.

Professor G Venkatesh: Do not you have to compute revenue for your SKU or it is okay to keep it like this with city and all?

Professor Milind Gandhe: We will keep it. So we have to compute it for every SKU.

Professor G Venkatesh: No but are we required to do it for every SKU within the city?

Professor Milind Gandhe: So we have to do it for every SKU in all cities for a given day.

Professor G Venkatesh: So add the three cities.

Professor Milind Gandhe: So the simplest way to do that is to do to a pivot table?

Professor G Venkatesh: To do a what?

Professor Milind Gandhe: To do a pivot table.

Professor G Venkatesh: Pivot table. Otherwise, you have to do some crazy calculations or keep adding.

Professor Milind Gandhe: You will have to do a lot of crazy calculation. It is the mechanism that is there in most spreadsheets that will allow you to analyze to slice and dice the data in different ways. So let us first look at this. Let us just first we selected the entire data and we will insert a pivot table.

(Refer Slide Time: 9:31)

Choose the data that you want to analyze.

Select a table or range

Table/Range: Sales Data!\$A\$1:\$I\$100

Use an external data source

Choose where to place the PivotTable.

New worksheet

Existing worksheet

Table/Range:

Cancel OK

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Professor Milind Gandhe: And we will call, we will put it in a new worksheet.

(Refer Slide Time: 9:43)

PivotTable Fields

FIELD NAME

Date

SKU

City

Volumes

Filters

Columns

Rows

Values

To build a report, choose fields from the PivotTable Field List

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Prof G Venkatesh

Excel interface showing a PivotTable setup. The PivotTable Fields task pane shows 'SKU' selected for the Values field. The data source is 'SKU Master'.



Excel interface showing a PivotTable setup. The PivotTable Fields task pane shows 'City', 'Volumes', 'Price', and 'Revenue' selected for the Values field. The data source is 'SKU Master'.



Excel interface showing a PivotTable setup. The PivotTable Fields task pane shows 'City', 'Volumes', 'Price', and 'Revenue' selected for the Values field. The data source is 'SKU Master'. The PivotTable shows the sum of revenue for each SKU.

Row Labels	Sum of Revenue
F01	274200
F02	85800
F03	96280
F04	100010
F05	35150
F06	39200
F07	44800
F08	11400
F09	17020
F10	50949
L01	313600
L02	182800
L03	266400
L04	307200
L05	389805
L06	132000
L07	262500
L08	58500
L09	54000



Professor Milind Gandhe: So and the first thing we want to do, G V now that we have got this pivot table in a new sheet we want to use this to analyze which SKU what is the total revenue for each SKU across all the days. So in this what we will do is our rows have to be SKUs. So we select these SKUs and we bring them into rows. So all the rows now are SKUs. And for each SKU...

Professor G Venkatesh: How did you select SKU and bring it into rows? What did you do? Just drag and drop?

Professor Milind Gandhe: Yes, you just drag and drop. And now you take the revenue and you drag and drop it into sigma values. So these are the computed values. These are the values that are going to be computed. So what this table now tells us, is that the total revenue we got from F01 across 15 days across 3 cities.

Professor G Venkatesh: So it did computation. It calculated?

Professor Milind Gandhe: It did it. Yes. We do not need to do anything.

Professor G Venkatesh: Wow! So it summed up all the days and all the cities?

Professor Milind Gandhe: Yes

Professor G Venkatesh: That is it? You do not have to anything.

Professor Milind Gandhe: No.

Professor G Venkatesh: I do not have to write a formula equal to sum of this and that and this and that and so on?

Professor Milind Gandhe: No.

Professor G Venkatesh: So this is the total revenue now. Can I do this...

(Refer Slide Time: 11:35)

The screenshot shows an Excel spreadsheet with a PivotTable. The PivotTable is currently formatted as 'Number'. A context menu is open, showing various number formats. The 'Currency' option is highlighted. The PivotTable Fields task pane on the right shows 'Revenue' selected under 'Values'. The spreadsheet data includes columns for SKU, Sales Data, and Stock Transfer, with a 'Grand Total' of 42974614.

The screenshot shows the same Excel spreadsheet, but now the PivotTable values are formatted as currency (₹). The 'Grand Total' is now ₹4,29,74,614.00. The context menu is no longer visible.

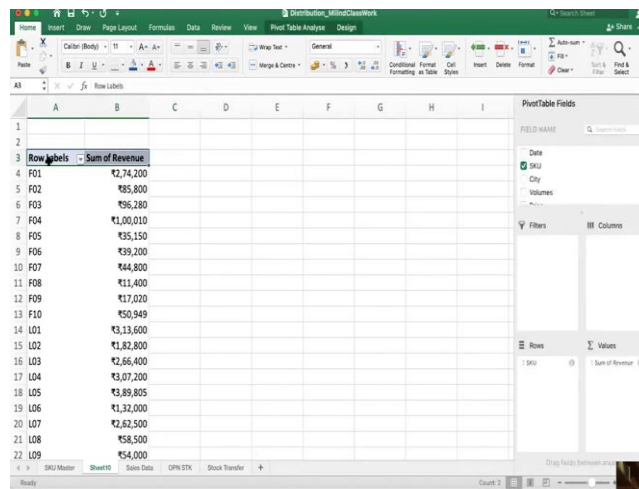
Professor Milind Gandhe: As a matter of good practice, we should format this as currency.

Professor G Venkatesh: You did not remember the currency. I thought we had currency there.

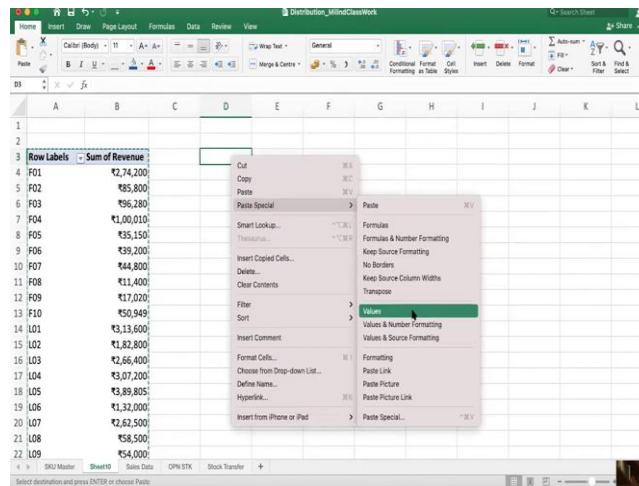
Professor Milind Gandhe: No I did not remember. But our question, the question that they had for us G V what they wanted us to figure out which is the SKU that is giving them the biggest volume.

Professor G Venkatesh: Highest revenue and highest volume.

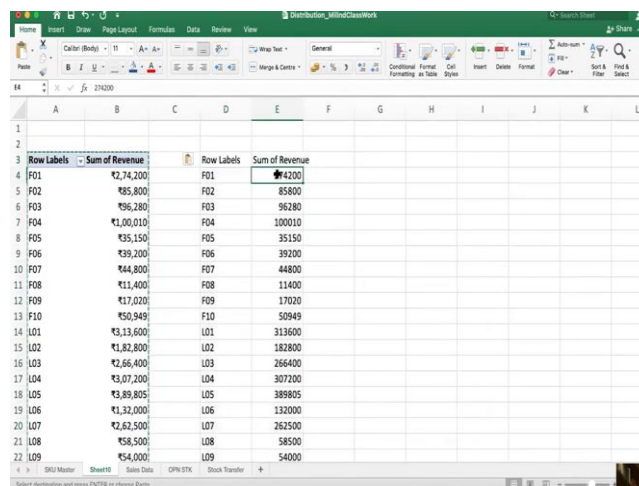
(Refer Slide Time: 12:13)



Row Labels	Sum of Revenue
F01	₹2,74,200
F02	₹85,800
F03	₹96,280
F04	₹1,00,010
F05	₹35,150
F06	₹39,200
F07	₹44,800
F08	₹11,400
F09	₹17,020
F10	₹50,949
L01	₹3,13,600
L02	₹1,82,800
L03	₹2,66,400
L04	₹3,07,200
L05	₹3,89,805
L06	₹1,32,000
L07	₹2,62,500
L08	₹58,500
L09	₹54,000

Row Labels	Sum of Revenue
F01	₹2,74,200
F02	₹85,800
F03	₹96,280
F04	₹1,00,010
F05	₹35,150
F06	₹39,200
F07	₹44,800
F08	₹11,400
F09	₹17,020
F10	₹50,949
L01	₹3,13,600
L02	₹1,82,800
L03	₹2,66,400
L04	₹3,07,200
L05	₹3,89,805
L06	₹1,32,000
L07	₹2,62,500
L08	₹58,500
L09	₹54,000

Row Labels	Sum of Revenue
F01	₹2,74,200
F02	₹85,800
F03	₹96,280
F04	₹1,00,010
F05	₹35,150
F06	₹39,200
F07	₹44,800
F08	₹11,400
F09	₹17,020
F10	₹50,949
L01	₹3,13,600
L02	₹1,82,800
L03	₹2,66,400
L04	₹3,07,200
L05	₹3,89,805
L06	₹1,32,000
L07	₹2,62,500
L08	₹58,500
L09	₹54,000



Professor Milind Gandhe: Now the simplest way to do it is to pick this. Pick this entire table cut it and paste it first as values.

(Refer Slide Time: 12:33)

The first screenshot shows an Excel spreadsheet with a table of data. The table has columns A, B, C, D, and E. The data is as follows:

	A	B	C	D	E
14	L01	₹13,600	L01	313600	
15	L02	₹1,82,800	L02	182800	
16	L03	₹2,66,400	L03	266400	
17	L04	₹3,07,200	L04	307200	
18	L05	₹3,89,805	L05	389805	
19	L06	₹1,32,000	L06	132000	
20	L07	₹2,62,500	L07	262500	
21	L08	₹58,500	L08	58500	
22	L09	₹54,000	L09	54000	
23	L10	₹60,000	L10	60000	
24	M01	₹1,09,08,000	M01	10908000	
25	M02	₹46,40,000	M02	4640000	
26	M03	₹54,72,000	M03	5472000	
27	M04	₹54,40,000	M04	5440000	
28	M05	₹15,36,000	M05	1536000	
29	M06	₹9,52,000	M06	952000	
30	M07	₹57,33,000	M07	5733000	
31	M08	₹15,12,000	M08	1512000	
32	M09	₹22,00,000	M09	2200000	
33	M10	₹18,00,000	M10	1800000	
34	Grand Total	₹4,29,74,614	Grand Total	42974614	

The second screenshot shows the same Excel spreadsheet after the data has been pasted as values. The data is as follows:

	A	B	C	D	E
14					
15					
16	Row Labels	Sum of Revenue	Row Labels	Sum of Revenue	
17	F01	₹2,74,200	F01	₹2,74,200	
18	F02	₹85,800	F02	₹85,800	
19	F03	₹96,280	F03	₹96,280	
20	F04	₹1,00,010	F04	₹1,00,010	
21	F05	₹35,150	F05	₹35,150	
22	F06	₹39,200	F06	₹39,200	
23	F07	₹44,800	F07	₹44,800	
24	F08	₹11,400	F08	₹11,400	
25	F09	₹17,020	F09	₹17,020	
26	F10	₹50,949	F10	₹50,949	
27	L01	₹3,13,600	L01	₹3,13,600	
28	L02	₹1,82,800	L02	₹1,82,800	
29	L03	₹2,66,400	L03	₹2,66,400	
30	L04	₹3,07,200	L04	₹3,07,200	
31	L05	₹3,89,805	L05	₹3,89,805	
32	L06	₹1,32,000	L06	₹1,32,000	
33	L07	₹2,62,500	L07	₹2,62,500	
34	L08	₹58,500	L08	₹58,500	
35	L09	₹54,000	L09	₹54,000	

Both screenshots include a video call window with Professor Milind Gandhe, who is wearing a blue shirt and glasses.

Professor Milind Gandhe: Unfortunately, the formatting is gone. So let us format it.

Professor G Venkatesh: I guess when you copy it, you can say paste special and paste it with format retained or something?

Professor Milind Gandhe: Yes, I could have actually, you are right. I could have kept it I could have pasted it as values but keeping source format. I think there is an option. Yes, you are right. And now we can this is the range we need to sort because we need to find which is the highest revenue.

Professor G Venkatesh: Look at M01 there, look at the, now you know why M01 is such a, look at the M01, one lakh nine thousand eight hundred, no sorry

Professor Milind Gandhe: One crore nine lakhs eight thousand (Rs. 10908000)

Professor G Venkatesh: My goodness sold 15 days. 10908000 worth of M01 they have sold. That is why such an important thing it is.

Professor Milind Gandhe: It is almost 25 percent of the total sales.

Professor G Venkatesh: Total sales is coming from M01. So what do you want to do? You want to sort?

Professor Milind Gandhe: Now we want to figure out we want to sort this. Because we want to know which SKU is selling the most. I think we already know roughly it is probably M01. We should but we want to know which is selling second, which is selling third, fourth and all.

Professor G Venkatesh: To sort it, you should select D also and sort. Sort along with D and E.

Professor Milind Gandhe: Yes, so it will actually do that automatically. So it will ask me saying do you want me to do that?

Professor Milind Gandhe: So let us sort.

Professor G Venkatesh: Let us sort it.

Professor Milind Gandhe: Let us sort largest.

Professor G Venkatesh: When you go for sorting? Data you have to go to?

(Refer Slide Time: 14:20)

Excel screenshot showing a data table with columns: Row Labels, Sum of Revenue, and Row Labels. The data is sorted by the second 'Row Labels' column. A 'Sort Warning' dialog box is displayed, asking 'What do you want to do?' with options: 'Expand the selection' (selected), 'Continue with the current selection', 'Cancel', and 'Sort'. The IIT Madras BSc Degree logo is visible in the top right corner.

Prof G Venkatesh

Excel screenshot showing the same data table and 'Sort Warning' dialog box. The 'Expand the selection' option is selected. The IIT Madras BSc Degree logo is visible in the top right corner.

Prof G Venkatesh

Excel screenshot showing the same data table and 'Sort Warning' dialog box. The 'Expand the selection' option is selected. The IIT Madras BSc Degree logo is visible in the top right corner.

Mind Gandhi

The screenshot displays an Excel spreadsheet titled 'Distribution_MilindClassWork'. The data is organized into columns A through K. Columns B, C, D, and E contain numerical values for various items. The Grand Total for column B is ₹4,29,74,614 and for column E is ₹4,29,74,614. A small video inset in the bottom right corner shows Professor Milind Gandhe.

	A	B	C	D	E	F	G	H	I	J	K
18	L05	₹3,89,805		L05	₹3,89,805						
19	L06	₹1,32,000		L06	₹1,32,000						
20	L07	₹2,62,500		L07	₹2,62,500						
21	L08	₹58,500		L08	₹58,500						
22	L09	₹54,000		L09	₹54,000						
23	L10	₹60,000		L10	₹60,000						
24	M01	₹1,09,08,000		M01	₹1,09,08,000						
25	M02	₹46,40,000		M02	₹46,40,000						
26	M03	₹54,72,000		M03	₹54,72,000						
27	M04	₹54,40,000		M04	₹54,40,000						
28	M05	₹15,36,000		M05	₹15,36,000						
29	M06	₹9,52,000		M06	₹9,52,000						
30	M07	₹57,33,000		M07	₹57,33,000						
31	M08	₹15,12,000		M08	₹15,12,000						
32	M09	₹22,00,000		M09	₹22,00,000						
33	M10	₹18,00,000		M10	₹18,00,000						
34	Grand Total	₹4,29,74,614		Grand Total	₹4,29,74,614						

Professor Milind Gandhe: Let me show you once again. So we go to sort and filter.

Professor G Venkatesh: Where do you go? Sort is directly there.

Professor Milind Gandhe: At the top, in the top ribbon right hand side.

Professor G Venkatesh: I cannot see. Let us just sort it.

Professor Milind Gandhe: If you click here sort and filter and it will give you two options. It can it will say sort smallest to largest or largest to smallest. It will also actually give you a custom sort. But right now we will not get into that. So we will just say sort largest to smallest and now it will ask me do you want to so the data in the neighboring column will not get sorted? Is that you want to do? Actually that is what you were saying that is what we want to do.

So it will, we allow it to expand to the selection. And so we continue. So now you can see that M01 of course grand total came on top but that is okay. But M01 is doing the highest contribution in terms of revenue. Actually, let me do one thing may be a good idea to not select grand total.

Professor G Venkatesh: If you just, here you might just select the D and E columns together and do a sort then it will sort.

(Refer Slide Time: 15:52)

Excel spreadsheet showing a table with columns: Row Labels, Sum of Revenue, Row Labels, Sum of Revenue. The table lists various product codes (F01 to F10, L01 to L09) and their corresponding revenue values. The status bar at the bottom indicates the average is 1422467.133, count is 60, and sum is 4207814.

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Excel spreadsheet showing the same table as above. The status bar at the bottom indicates the average is 1422467.133, count is 60, and sum is 4207814.

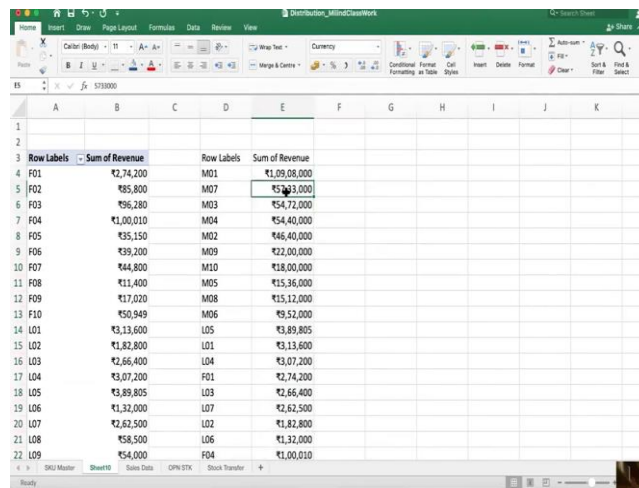
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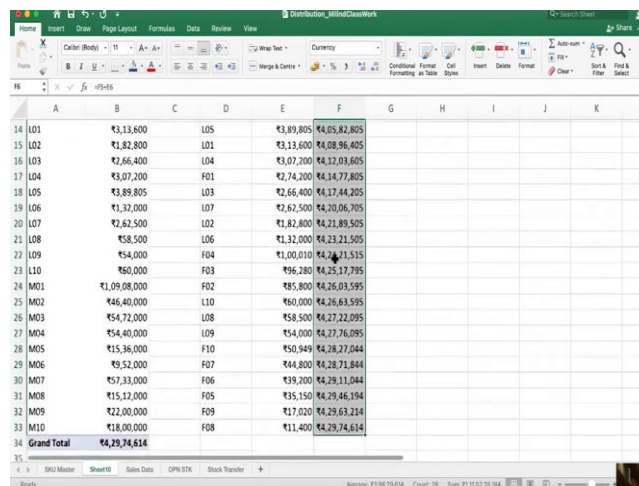
Excel spreadsheet showing the same table as above. A "Sort Warning" dialog box is displayed, asking "What do you want to do?" with options: "Expand the selection", "Continue with the current selection", "Cancel", and "Sort".

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Prof G Venkatesh



Row Labels	Sum of Revenue	Row Labels	Sum of Revenue
F01	₹2,74,200	M01	₹1,09,08,000
F02	₹85,800	M07	₹57,33,000
F03	₹96,280	M03	₹54,72,000
F04	₹1,00,010	M04	₹54,40,000
F05	₹35,150	M02	₹46,40,000
F06	₹39,200	M09	₹22,00,000
F07	₹44,800	M10	₹18,00,000
F08	₹11,400	M05	₹15,36,000
F09	₹17,020	M08	₹15,12,000
F10	₹50,949	M06	₹9,52,000
L01	₹3,13,600	L05	₹3,89,805
L02	₹1,82,800	L01	₹3,13,600
L03	₹2,66,400	L04	₹3,07,200
L04	₹3,07,200	F01	₹2,74,200
L05	₹3,89,805	L03	₹2,66,400
L06	₹1,32,000	L07	₹2,62,500
L07	₹2,62,500	L02	₹1,82,800
L08	₹58,500	L06	₹1,32,000
L09	₹54,000	F04	₹1,00,010

Row Labels	Sum of Revenue	Row Labels	Sum of Revenue
L01	₹3,13,600	L05	₹3,89,805
L02	₹1,82,800	L01	₹3,13,600
L03	₹2,66,400	L04	₹3,07,200
L04	₹3,07,200	F01	₹2,74,200
L05	₹3,89,805	L03	₹2,66,400
L06	₹1,32,000	L07	₹2,62,500
L07	₹2,62,500	L02	₹1,82,800
L08	₹58,500	L06	₹1,32,000
L09	₹54,000	F04	₹1,00,010
L10	₹50,000	F03	₹96,280
M01	₹1,09,08,000	F02	₹85,800
M02	₹46,40,000	L10	₹50,000
M03	₹54,72,000	L08	₹58,500
M04	₹54,40,000	L09	₹54,000
M05	₹15,36,000	F10	₹50,949
M06	₹9,52,000	F07	₹44,800
M07	₹57,33,000	F06	₹39,200
M08	₹15,12,000	F05	₹35,150
M09	₹22,00,000	F09	₹17,020
M10	₹18,00,000	F08	₹11,400
Grand Total	₹4,29,74,614		



Professor Milind Gandhe: Yeah, correct. So now if I do that. No that gets that is not.

Professor G Venkatesh: You have to go to data and sort you will get it from data sort.

Professor Milind Gandhe: Now it is done. Now, we want to find out, so G V there is this theory that I want to test out, the theory...

Professor G Venkatesh: Once again, let me just see this. So all the Ms are sitting at the top looks like.

Professor Milind Gandhe: Yes, looks like actually.

Professor G Venkatesh: 3 4 5 6 7 8 9 10 all of them are there.

Professor Milind Gandhe: Just simple way of counting by the way GV is that we just collect this Ms, All these Ms you can see at the bottom it will tell you count 10.

Professor G Venkatesh: We got that top 10 revenue items are mobiles. So you know why ecommerce companies really push mobile phones? I think because mobile phone seems to bring money for them.

Professor Milind Gandhe: So one theory I have heard G V that I want to test out is that anytime when you have lots of such things going on 80 percent of the result comes from 20 percent of things. So 20 percent of your effort gives you 80 percent of the result.

Professor G Venkatesh: This is Pareto, Pareto principle.

Professor Milind Gandhe: This is the Pareto theory, Pareto's principle. So shall we see if that applies here. It may apply, because you can see that 25 percent is just coming from M01.

Professor G Venkatesh: It looks like it will apply. So 80 percent so what you are saying is 80 percent of the revenues you keep cumulating the revenues. Presumably?

Professor Milind Gandhe: Correct. We should compute cumulative revenue.

Professor G Venkatesh: 80 percent of the revenues you are saying come from 20 percent. Here in this case 30 30 SKUs are there so 20 percent SKUs 6 should come from 6 SKUs. So it should come from the first 6 SKUs 20 percent 80 percent comes from the first. Let us see. May be it does, I do not know.

Professor Milind Gandhe: So how do we compute cumulative revenue? So the cumulative revenue as far as the first row is concerned is just the revenue of the first SKU the topmost SKU. Cumulative revenue for the next second SKU is the cumulative revenue so far plus, the revenue of the second SKU.

Professor G Venkatesh: Also called a recurrence equation.

Professor Milind Gandhe: Yes. Recurring equation.

Professor G Venkatesh: Sum of the first n plus 1 (terms) is equal to the sum up to n plus the n plus 1 stuff. The recurrence.

Formula: Cumulative sum of first $n+1$ terms = sum of first n terms + $(n+1)$ th term

Professor Milind Gandhe: Now we can we will see.

Professor G Venkatesh: You just the drag it.

Professor Milind Gandhe: So in the third case it is the sum of the first two which we already have here. In F5 plus the third SKU.

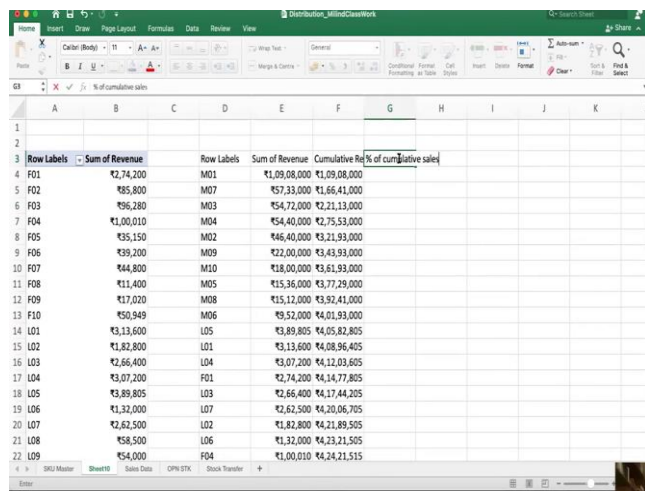
Professor G Venkatesh: It is the same, same formula?

Professor Milind Gandhe: Now I can just drag this.

Professor G Venkatesh: You can just drag it. It is the same formula.

Professor Milind Gandhe: Now, we want to find out percentage G V. Because we said 80 percent, 80-20 that 80 percent we want.

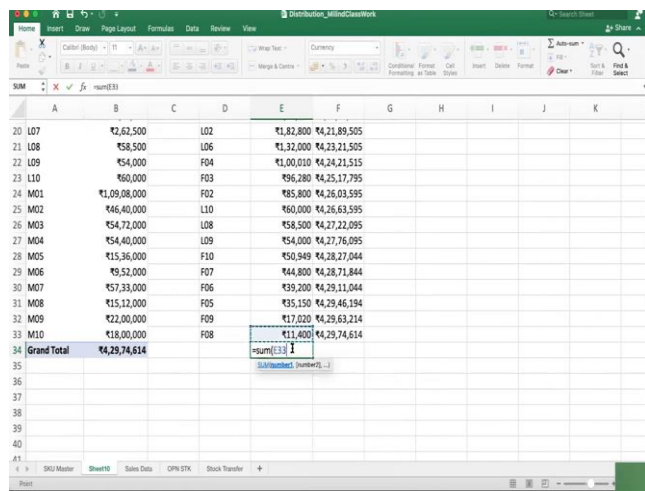
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The screenshot shows an Excel spreadsheet with the following data:

Row Labels	Sum of Revenue	Row Labels	Sum of Revenue	Cumulative Ref	% of cumulative sales
F01	₹2,74,200	M01	₹1,09,08,000	₹1,09,08,000	
F02	₹85,800	M07	₹57,33,000	₹1,66,41,000	
F03	₹96,280	M03	₹54,72,000	₹2,21,13,000	
F04	₹1,00,010	M04	₹54,40,000	₹2,75,53,000	
F05	₹35,150	M02	₹46,40,000	₹3,21,93,000	
F06	₹39,200	M09	₹22,00,000	₹3,43,93,000	
F07	₹44,800	M10	₹18,00,000	₹3,61,93,000	
F08	₹11,400	M05	₹15,36,000	₹3,77,29,000	
F09	₹17,020	M08	₹15,12,000	₹3,92,41,000	
F10	₹50,949	M06	₹9,52,000	₹4,01,93,000	
L01	₹3,13,600	L05	₹3,89,805	₹4,05,82,805	
L02	₹1,82,800	L01	₹3,13,600	₹4,08,96,405	
L03	₹2,66,400	L04	₹3,07,200	₹4,12,03,605	
L04	₹3,07,200	F01	₹2,74,200	₹4,14,77,805	
L05	₹3,89,805	L03	₹2,66,400	₹4,17,44,205	
L06	₹1,32,000	L07	₹2,62,500	₹4,20,06,705	
L07	₹2,62,500	L02	₹1,82,800	₹4,21,89,505	
L08	₹58,500	L06	₹1,32,000	₹4,23,21,505	
L09	₹54,000	F04	₹1,00,010	₹4,24,21,515	

The formula bar shows: `=sum(B3:B5)`



The screenshot shows an Excel spreadsheet with the following data:

Row Labels	Sum of Revenue	Row Labels	Sum of Revenue	Cumulative Ref	% of cumulative sales
L07	₹2,62,500	L02	₹1,82,800	₹4,21,89,505	
L08	₹58,500	L06	₹1,32,000	₹4,23,21,505	
L09	₹54,000	F04	₹1,00,010	₹4,24,21,515	
L10	₹50,000	F03	₹96,280	₹4,25,17,795	
M01	₹1,09,08,000	F02	₹85,800	₹4,26,03,595	
M02	₹46,40,000	L10	₹50,000	₹4,26,63,595	
M03	₹54,72,000	L08	₹58,500	₹4,27,22,095	
M04	₹54,40,000	L09	₹54,000	₹4,27,76,095	
M05	₹15,36,000	F10	₹50,949	₹4,28,27,044	
M06	₹9,52,000	F07	₹44,800	₹4,28,71,844	
M07	₹57,33,000	F06	₹39,200	₹4,28,11,044	
M08	₹15,12,000	F05	₹35,150	₹4,28,46,194	
M09	₹22,00,000	F09	₹17,020	₹4,28,63,214	
M10	₹18,00,000	F08	₹11,400	₹4,28,74,614	
Grand Total	₹4,28,74,614				

The formula bar shows: `=sum(B3:B5)`

Professor Milind Gandhe: So let us take percentage of cumulative sales. So for that, let us go here and maybe what we will do I know we removed that grand total, because it was interfering with the...

Professor G Venkatesh: The last one will be the cumulative total only, anyway. But you can do it. Let us do it. It is a better thing.

Professor Milind Gandhe: Let us do it. You are right, actually 429 429. So now we want to know, the sale of M01 is what percentage of the total sale.

Professor G Venkatesh: You want to see what the cumulative, you want to do F4...

Professor Milind Gandhe: Correct, you are right. We want to know the cumulative sales...

Professor G Venkatesh: I have cumulative, so far the current cumulative total to the final cumulative total. Current cumulative total to the final cumulative total, final cumulative total is 429.

Professor Milind Gandhe: But we will we need to put a dollar. So we will say dollar dollar. And this is I think a good idea to show it as a percentage.

Professor G Venkatesh: Now we will see what happens. Let us see the magic now.

Professor Milind Gandhe: 80.

Professor G Venkatesh: Yay! This is kicking here.

Professor Milind Gandhe: And this is...

Professor G Venkatesh: This is what, is really, I do not know, very, what is the probability of happening here?

Professor Milind Gandhe: Amazing.

Professor G Venkatesh: This is real data, this data actually, that came from.

Professor Milind Gandhe: Amazing.

Professor G Venkatesh: Real data.

Professor Milind Gandhe: This is the really data.

Professor G Venkatesh: So 25, 39, 51, 64, 75, 80. So it is going pretty fast after that it is going down 75 to 80, 80 to 84, 88, 91, 94, 94, 95, so it is flattened actually there 94, 94, 95

and this is 96 it is not going much. And certainly after here it will be, will not go much. So you can see basically that we have got almost 99 percent of revenues from almost 15. First 15 items.

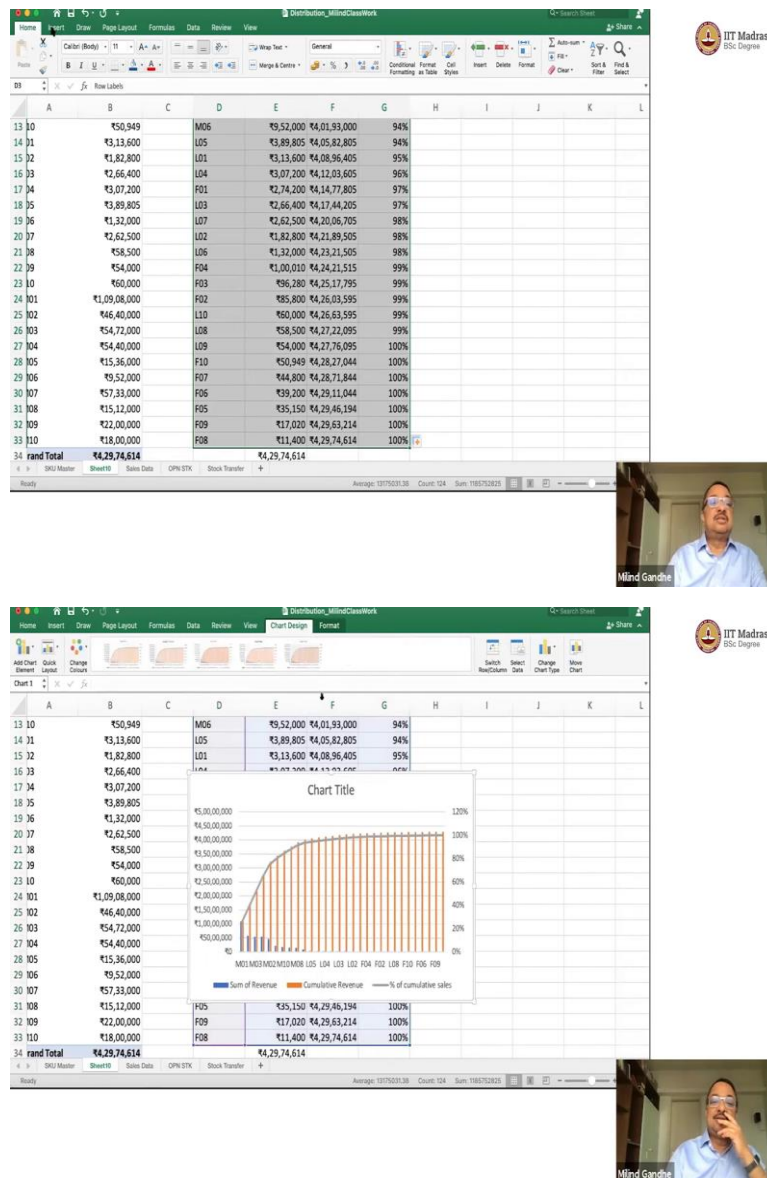
Professor Milind Gandhe: Yes.

Professor G Venkatesh: 80 percent we got from the first 6 items, and then from first to 15 items so we got 99 percent revenue.

Professor Milind Gandhe: So what is the best way of showing this to Omkar, G V?

Professor G Venkatesh: This table is very cannot even make out anymore. We should plot... You should plot, Let us make a graph, let us see what it does. Make a line graph.

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Professor Milind Gandhe: Let us go to insert. Why do not I see what graph it is recommending to me?

Professor G Venkatesh: Let us see.

Professor Milind Gandhe: It is recommending something. Shall I try this? Let us see what it is.

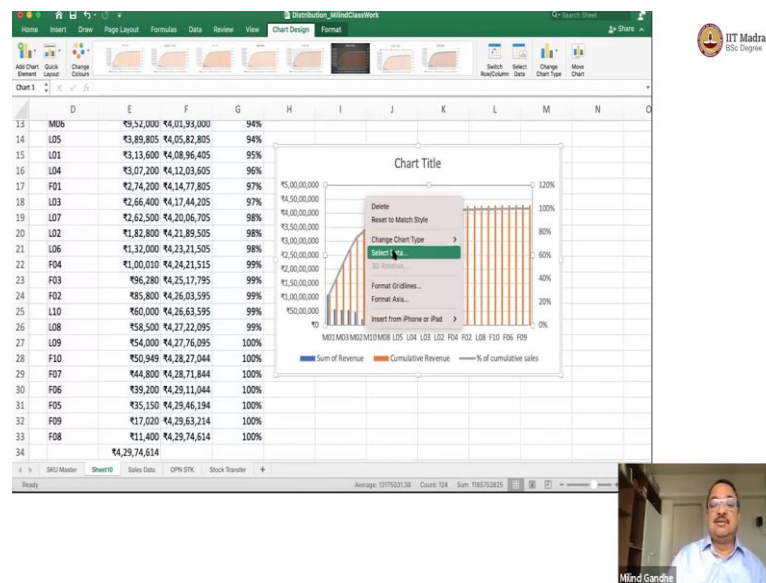
Professor G Venkatesh: It made some stack. It made stack and a line.

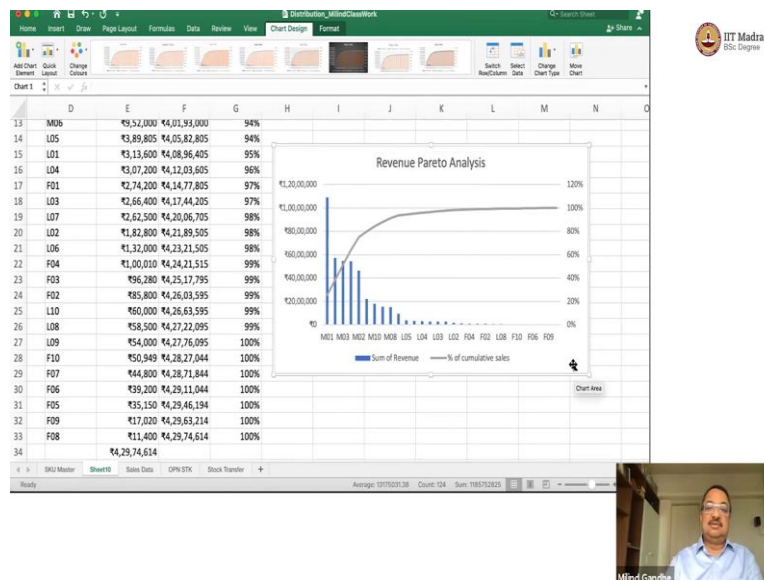
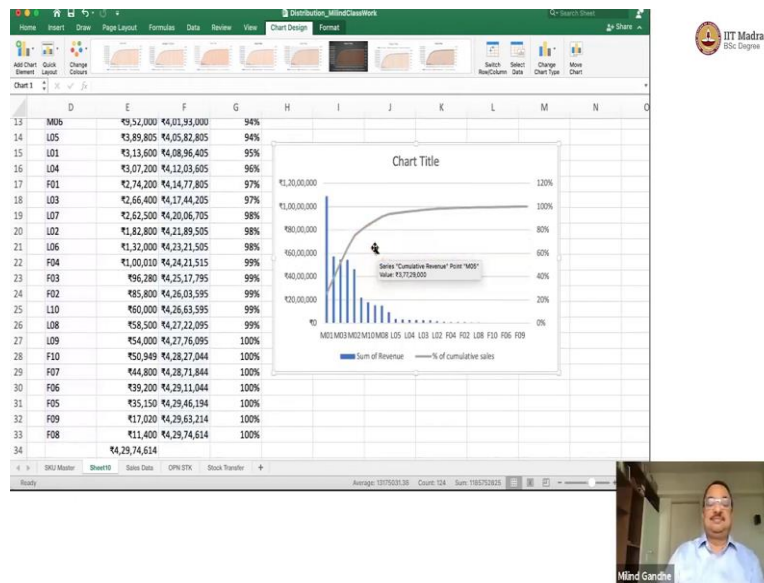
Professor Milind Gandhe: No, no. So it is, it showing us two series actually, it showing this if you see this is the blue line, which is the revenue and the orange line is the cumulative revenue. But actually, that orange line is just cluttering things up G V.

Professor G Venkatesh: Remove it.

Professor Milind Gandhe: I will remove it, I will just remove it

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Professor Milind Gandhe: So here is what we do. We will, if I just select this, if I select the orange lines and I press it. That is it. This is looking much better.

Professor G Venkatesh: So we have revenue and we have what is that is a percentage.

Professor Milind Gandhe: On the right hand side, it is showing you the percentage. On the left hand side, it is showing revenue and on X axis you have, so do you want me to label it?

Professor G Venkatesh: Not required.

Professor Milind Gandhe: Not required.

Professor G Venkatesh: Because it is clear. It is visible. I think you can see 80 percent.

Professor Milind Gandhe: Maybe just the chart title, I will make it. What shall I call this? I will call it revenue Pareto. Revenue Pareto analysis I will call this. This is we can show this graph to Omkar.

Professor G Venkatesh: This graph looks good.

Professor Milind Gandhe: So this sheet also G V it may be a good idea to rename instead of sheet 10. We will call this worksheet revenue Pareto.