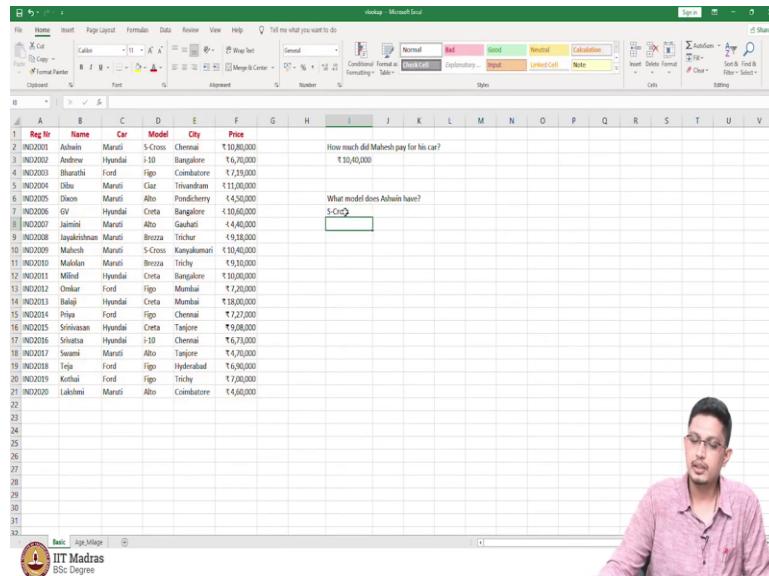


**Business Data Management**  
**Professor. Mister Swaminathan Rammohan**  
**Indian Institute of Technology, Madras**  
**Lecture No. 10**  
**VLOOKUP And PIVOT TABLE**

(Refer Slide Time: 0:16)



The screenshot shows a Microsoft Excel spreadsheet titled "Vlookup - Microsoft Excel". The data consists of 21 rows of vehicle registration details. A formula is being demonstrated in cell I2, which is currently displaying the value "10,40,000". The formula is =VLOOKUP("Muthesh",A2:H21,4,0). The user has typed "Muthesh" into the formula bar, and the formula is being evaluated. The background features a watermark of a man speaking.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	Reg No	Name	Car	Model	City	Price															
2	IND20201	Ashwin	Maruti	S-Cross	Chennai	₹10,00,000															
3	IND20202	Andrew	Hyundai	i10	Bangalore	₹6,70,000															
4	IND20203	Bharathi	Ford	Tigo	Coimbatore	₹7,50,000															
5	IND20204	Dinesh	Maruti	Ciaz	Trivandrum	₹11,00,000															
6	IND20205	Dinesh	Maruti	Alto	Pondicherry	₹4,50,000															
7	IND20206	GV	Hyundai	Creta	Bangalore	₹10,00,000															
8	IND20207	Jaimini	Maruti	Alto	Gauhati	₹4,40,000															
9	IND20208	Jayakrishnan	Maruti	Brezza	Trichur	₹9,30,000															
10	IND20209	Mahesh	Maruti	S-Cross	Kanyakumari	₹10,40,000															
11	IND20210	Makolen	Maruti	Brezza	Trichy	₹9,10,000															
12	IND20211	Murali	Hyundai	Creta	Bangalore	₹10,00,000															
13	IND20212	Omkar	Ford	Tigo	Kerala	₹7,20,000															
14	IND20213	Palaji	Hyundai	Creta	Mumbai	₹10,00,000															
15	IND20214	Priya	Ford	Tigo	Chennai	₹7,72,000															
16	IND20215	Srinivasan	Hyundai	Creta	Tanjore	₹9,00,000															
17	IND20216	Srinivas	Hyundai	i10	Chennai	₹6,73,000															
18	IND20217	Suami	Maruti	Alto	Tanjore	₹4,70,000															
19	IND20218	Teja	Ford	Tigo	Hyderabad	₹6,80,000															
20	IND20219	Kothai	Ford	Tigo	Trichy	₹7,00,000															
21	IND20220	Lakshmi	Maruti	Alto	Coimbatore	₹4,60,000															
22																					
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31																					
32																					

Hello everyone, and welcome to this tutorial session on VLOOKUP and PIVOT TABLES. I am Swaminathan, one of the co-instructors of this BDM course.

So, for those of you who are familiar with concepts like VLOOKUP and PIVOT TABLE please feel free to skip this video, but I would recommend you to watch this video since this might give you a better intuitive understanding of these tools, that is VLOOKUP and PIVOT TABLE. So, let me quickly show you the data which I created some 45 minutes back.

So, this is the data we have, we have registration numbers and name. So, these names are very famous in the online degree program. I have taken the liberty of using some names, and then we have car, the manufacturers like Maruti, Hyundai, Ford, and so on. Then we also have model, we have the city to which they are registered and then we have price.

(Refer Slide Time: 1:10)

The screenshot shows a Microsoft Excel spreadsheet titled "Basic". The data is organized into three columns: "Reg Nr", "Age of the Car", and "Mileage". The first row contains the column headers. The subsequent 21 rows provide data points, such as IN00209 having an age of 4 and mileage of 9. The Excel ribbon at the top includes tabs for Home, Insert, Page Layout, Formulas, Data, Review, View, and Help. The status bar at the bottom indicates "Edit Age\_Milege".

Reg Nr	Age of the Car	Mileage
IN00209	10	18
IN00210	4	9
IN00211	4	6
IN00212	9	13
IN00213	5	17
IN00214	4	11
IN00215	7	16
IN00216	10	16
IN00217	7	10
IN00218	9	15
IN00219	10	13
IN00220	4	17
IN00221	3	11
IN00222	2	15
IN00223	4	15
IN00224	9	17
IN00225	8	8
IN00226	8	17
IN00227	6	15

And then in the next sheet we have some other additional information which is the age of the car, that is, how old the car is, and what is the mileage that this car returns. And most of these data are cooked up, so none of them are real. So, just enjoy the video. And this is just for the explanation purpose.

(Refer Slide Time: 1:25)

The screenshot shows a Microsoft Excel spreadsheet titled "Basic". The data is organized into six columns: "Reg Nr", "Name", "Car", "Model", "City", and "Price". The first row contains the column headers. The subsequent 21 rows provide data points, such as IN00201 having a Maruti S-Cross in Chennai for ₹10,00,000. A formula is visible in cell F2: =VLOOKUP(B2,F\$1:F\$21,5,TRUE). The status bar at the bottom indicates "Edit Age\_Milege".

Reg Nr	Name	Car	Model	City	Price
IN00201	Aishwin	Maruti	S-Cross	Chennai	₹10,00,000
IN00202	Andrew	Hyundai	i10	Bangalore	₹6,00,000
IN00203	Bharathi	Ford	Tigo	Coimbatore	₹7,20,000
IN00204	Dilip	Maruti	Ciaz	Trivandrum	₹11,00,000
IN00205	Dinesh	Maruti	Alto	Pondicherry	₹4,50,000
IN00206	GV	Hyundai	Creta	Bangalore	₹10,00,000
IN00207	Jainiini	Maruti	Alto	Gauhati	₹4,40,000
IN00208	Jayakrishnan	Maruti	Brezza	Trichur	₹9,30,000
IN00209	Mallesh	Maruti	S-Cross	Kanyakumari	₹10,40,000
IN00210	Malikhan	Maruti	Brezza	Tiruchy	₹9,20,000
IN00211	Manisha	Maruti	Brezza	Chennai	₹9,30,000
IN00212	Neeraj	Hyundai	Creta	Bangalore	₹10,00,000
IN00213	Omkar	Ford	Tigo	Mumbai	₹7,20,000
IN00214	Balaji	Hyundai	Creta	Mumbai	₹10,00,000
IN00215	Priya	Ford	Tigo	Chennai	₹7,22,000
IN00216	Srinivasan	Hyundai	Creta	Tajpur	₹9,20,000
IN00217	Srinidhi	Hyundai	i10	Chennai	₹6,70,000
IN00218	Seema	Maruti	Alto	Tajpur	₹4,70,000
IN00219	Teja	Ford	Tigo	Hyderabad	₹6,90,000
IN00220	Kothai	Ford	Tigo	Trichy	₹7,00,000
IN00221	Lakshmi	Maruti	Alto	Coimbatore	₹4,60,000

Reg Nr	Name	Car	Model	City	Price	
IND20201	Ashwin	Maruti	S-Cross	Chennai	₹ 10,00,000	How much did Mahesh pay for his car?
IND20202	Andrew	Hyundai	i10	Bangalore	₹ 6,00,000	₹ 10,00,000
IND20203	Bharathi	Ford	Tigo	Coimbatore	₹ 7,00,000	
IND20204	Bhanu	Maruti	Car	Trivandrum	₹ 11,00,000	
IND20205	Dinesh	Maruti	Alto	Pondicherry	₹ 4,50,000	
IND20206	GV	Hyundai	Creta	Bangalore	₹ 10,00,000	
IND20207	Hari	Maruti	Alto	Ahmedabad	₹ 4,00,000	
IND20208	Jayalakshmi	Maruti	Alto	Trivandrum	₹ 9,00,000	
IND20209	Mahesh	Maruti	S-Cross	Kanjikulam	₹ 10,00,000	
IND20210	Makolen	Maruti	Rezza	Tiruchy	₹ 9,00,000	
IND20211	Milind	Hyundai	Creta	Bangalore	₹ 10,00,000	
IND20212	Omkar	Ford	Tigo	Mumbai	₹ 7,20,000	
IND20213	Balaji	Hyundai	Creta	Mumbai	₹ 18,00,000	
IND20214	Priya	Ford	Tigo	Chennai	₹ 7,20,000	
IND20215	Srinivasan	Hyundai	Creta	Tanjore	₹ 9,00,000	
IND20216	Srinivasu	Hyundai	i10	Chennai	₹ 6,70,000	
IND20217	Swami	Maruti	Alto	Tanjore	₹ 4,70,000	
IND20218	Teja	Ford	Tigo	Hyderabad	₹ 7,00,000	
IND20219	Kothai	Ford	Tigo	Tiruchy	₹ 7,00,000	
IND20220	Lakshmi	Maruti	Alto	Coimbatore	₹ 4,80,000	

So, first let us ask some interesting questions from this data. For example, I want to know how much did Mahesh pay for his car. So, let me type down that question. How much did Mahesh pay for his car? So, there are many ways to get the answer for this, there are many ways to get the answer to this question. but we will particularly use this VLOOKUP.

So, I am going to type equal to here v1. The moment I type v1 it is going to give me an auto suggestion for VLOOKUP. So, I have two options, I can press tab or I could double click on VLOOKUP. And then the moment I give this expression equal to VLOOKUP open parenthesis it is going to ask me for a lookup value.

So now, since I am interested in knowing the price of Mahesh's car, let me select Mahesh. So, the moment I select Mahesh it is going to say B 10, B 10 in the sense column B and tenth row. So, column B and tenth row. After the lookup value it is going to ask me for the table array. So, I am going to select the table. So, I have selected the table. You might wonder why, why have I not selected the column A.

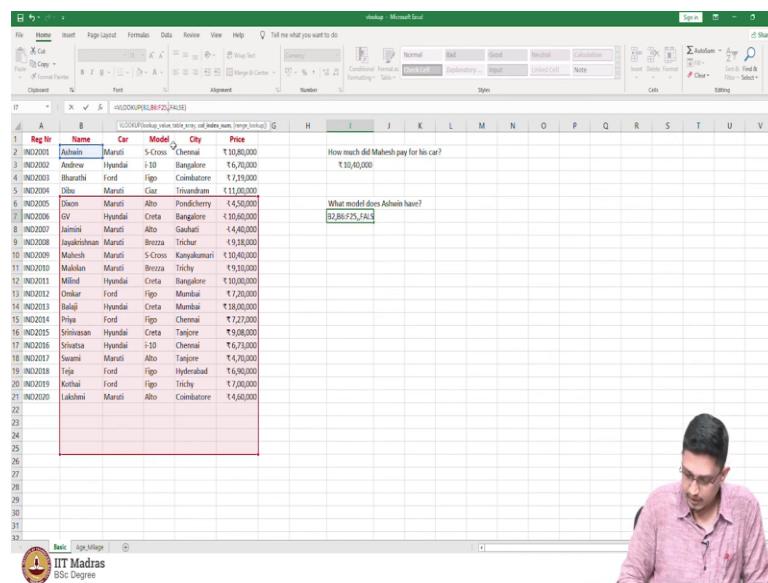
That is because VLOOKUP works in a particular way. The VLOOKUP stands for vertical lookup. It is going to look up in the first column. So, since Mahesh is being placed in column B, I am selecting the table starting from column B. And I have selected the entire table because I want to know the price of Mahesh's car which is lying in the fifth column in the selected table.

And next it is going to ask me for the column index number. So, here, the price of the car lies in the fifth column, in the selected table. So, as you see column B is number 1, this is number 2, 3,

4 and 5. So, the price is available in the fifth column of the table array. Next it is going to ask for an approximate match or an exact match. So, 90 to 95 percent of the time you will be using the exact match. So, you have two options you can type false or you can even use zero, for false. False indicates exact match.

So, the moment you do this it is going to show you the value of Mahesh's car price. So, let us round it out and change the format to currency, and whenever you do such automation it is always good to do a spot check. For example, VLOOKUP says the price of Mahesh's car is 10 lakh 40 thousand. So, why do not we go and check this out? It is again 10 lakh 40 thousand. So, let us do this for another question.

(Refer Slide Time: 4:35)



The screenshot shows a Microsoft Excel spreadsheet titled "Vlookup - Microsoft Excel". The formula bar displays the formula: =VLOOKUP(B2,B2:F2,[FALSE]). The table has columns A through V. Column A is "Reg No.", B is "Name", C is "Car", D is "Model", E is "City", and F is "Price". Row 2 contains the data: IN02001 Alwin Maruti S-Cross Chennai ₹10,80,000. Row 3 contains: IN02002 Andrew Hyundai i10 Bangalore ₹6,70,000. Row 4 contains: IN02003 Bharath Ford Figo Combinatore ₹7,30,000. Row 5 contains: IN02004 Dile Maruti Ciaz Trivandrum ₹11,00,000. Row 6 contains: IN02005 Dixon Maruti Alto Pondicherry ₹4,50,000. Row 7 contains: IN02006 GV Hyundai Creta Bangalore ₹10,80,000. Row 8 contains: IN02007 Jaimini Maruti Alto Gauhati ₹4,40,000. Row 9 contains: IN02008 Jayakrishnan Maruti Brezza Trichur ₹9,30,000. Row 10 contains: IN02009 Mahesh Maruti S-Cross Kavayalur ₹10,40,000. Row 11 contains: IN02010 Malolan Maruti Alto Bangalore ₹4,30,000. Row 12 contains: IN02011 Meenakshi Maruti Ciaz Bangalore ₹10,00,000. Row 13 contains: IN02012 Onkar Ford Figo Mumbai ₹7,20,000. Row 14 contains: IN02013 Balaji Hyundai Creta Mumbai ₹18,00,000. Row 15 contains: IN02014 Priya Ford Figo Chennai ₹7,20,000. Row 16 contains: IN02015 Sriivasapuri Hyundai i10 Chennai ₹9,80,000. Row 17 contains: IN02016 Srikrishna Hyundai i10 Chennai ₹6,70,000. Row 18 contains: IN02017 Suami Maruti Alto Tanjore ₹4,0,000. Row 19 contains: IN02018 Teja Ford Figo Hyderabad ₹6,90,000. Row 20 contains: IN02019 Kothai Ford Figo Trichy ₹7,00,000. Row 21 contains: IN02020 Lakshmi Maruti Alto Combinatore ₹4,60,000. Row 22 is blank. Rows 23 through 31 are also blank. Row 32 contains the formula =VLOOKUP(B2,B2:F2,[FALSE]) in cell F2. The result of the formula is displayed in cell F2 as ₹10,40,000. The status bar at the bottom left shows "Basic IIT Madras BSc Degree".

Microsoft Excel

File Home Insert Page Layout Formulas Data Review View Help Tell me what you want to do

Font Size Alignment Number Styles Cells

Reg Nr Name Car Model City Price

How much did Mahesh pay for his car?  
=IF(A2="Mahesh", D2, "")

What model does Ashwin have?  
=IF(B2="Ashwin", C2, "")

Reg Nr	Name	Car	Model	City	Price
IND02001	Ashwin	Maruti	S-Cross	Chennai	₹10,00,000
IND02002	Andrew	Hyundai	i10	Bangalore	₹6,00,000
IND02003	Bharathi	Ford	Tigo	Coimbatore	₹7,00,000
IND02004	Dileep	Maruti	i20	Trivandrum	₹11,00,000
IND02005	Dinesh	Maruti	Astro	Pondicherry	₹4,50,000
IND02006	GV	Hyundai	Creta	Bangalore	₹10,00,000
IND02007	Jamil	Maruti	Gypsy	Gauhati	₹4,00,000
IND02008	Jayalakshmi	Maruti	Brezza	Trichy	₹9,00,000
IND02009	Mahesh	Maruti	S-Cross	Kanjikulam	₹10,00,000
IND02010	Malikson	Maruti	Brezza	Trichy	₹9,00,000
IND02011	Milind	Hyundai	Creta	Bangalore	₹10,00,000
IND02012	Omkar	Ford	Tigo	Mumbai	₹7,00,000
IND02013	Balaji	Hyundai	Creta	Mumbai	₹18,00,000
IND02014	Priya	Ford	Tigo	Chennai	₹7,20,000
IND02015	Srinivas	Hyundai	Creta	Tanjore	₹9,00,000
IND02016	Srinivas	Hyundai	i10	Chennai	₹6,70,000
IND02017	Swami	Maruti	Astro	Tanjore	₹4,70,000
IND02018	Teja	Ford	Tigo	Hyderabad	₹6,90,000
IND02019	Kothai	Ford	Tigo	Trichy	₹7,00,000
IND02020	Lakshmi	Maruti	Astro	Coimbatore	₹4,80,000

Basic Age-Milage  
IT Madras BSc Degree

Microsoft Excel

File Home Insert Page Layout Formulas Data Review View Help Tell me what you want to do

Font Size Alignment Number Styles Cells

Reg Nr Name Car Model City Price

How much did Mahesh pay for his car?  
=IF(A2="Mahesh", D2, "")

What model does Ashwin have?  
=IF(B2="Ashwin", C2, "")

Reg Nr	Name	Car	Model	City	Price
IND02001	Ashwin	Maruti	S-Cross	Chennai	₹10,00,000
IND02002	Andrew	Hyundai	i10	Bangalore	₹6,00,000
IND02003	Bharathi	Ford	Tigo	Coimbatore	₹7,00,000
IND02004	Dileep	Maruti	i20	Trivandrum	₹11,00,000
IND02005	Dinesh	Maruti	Astro	Pondicherry	₹4,50,000
IND02006	GV	Hyundai	Creta	Bangalore	₹10,00,000
IND02007	Jamil	Maruti	Gypsy	Gauhati	₹4,00,000
IND02008	Jayalakshmi	Maruti	Brezza	Trichy	₹9,00,000
IND02009	Mahesh	Maruti	S-Cross	Kanjikulam	₹10,00,000
IND02010	Malikson	Maruti	Brezza	Trichy	₹9,00,000
IND02011	Milind	Hyundai	Creta	Bangalore	₹10,00,000
IND02012	Omkar	Ford	Tigo	Mumbai	₹7,00,000
IND02013	Balaji	Hyundai	Creta	Mumbai	₹18,00,000
IND02014	Priya	Ford	Tigo	Chennai	₹7,20,000
IND02015	Srinivas	Hyundai	Creta	Tanjore	₹9,00,000
IND02016	Srinivas	Hyundai	i10	Chennai	₹6,70,000
IND02017	Swami	Maruti	Astro	Tanjore	₹4,70,000
IND02018	Teja	Ford	Tigo	Hyderabad	₹6,90,000
IND02019	Kothai	Ford	Tigo	Trichy	₹7,00,000
IND02020	Lakshmi	Maruti	Astro	Coimbatore	₹4,80,000

Basic Age-Milage  
IT Madras BSc Degree

Reg Nr	Name	Car	Model	City	Price
IND20201	Ashwin	Maruti	S-Cross	Chennai	₹10,80,000
IND20202	Andrew	Hyundai	i10	Bangalore	₹6,80,000
IND20203	Bharathi	Ford	Tigo	Coimbatore	₹7,80,000
IND20204	Bhanu	Maruti	i20	Trivandrum	₹11,00,000
IND20205	Dinesh	Maruti	Astro	Pondicherry	₹4,50,000
IND20206	GV	Hyundai	Creta	Bangalore	₹9,80,000
IND20207	Hemal	Maruti	i20	Chennai	₹4,80,000
IND20208	Jayakrishnan	Maruti	Bezza	Trichur	₹9,20,000
IND20209	Mahesh	Maruti	S-Cross	Kanjikulam	₹10,80,000
IND20210	Malik	Maruti	Bezza	Tiruchy	₹9,30,000
IND20211	Milind	Hyundai	Creta	Bangalore	₹10,80,000
IND20212	Omkar	Ford	Tigo	Mumbai	₹7,20,000
IND20213	Balaji	Hyundai	Creta	Mumbai	₹18,00,000
IND20214	Priya	Ford	Tigo	Chennai	₹7,20,000
IND20215	Srinivasan	Hyundai	Creta	Tanjore	₹9,80,000
IND20216	Srinivasu	Hyundai	i10	Chennai	₹6,70,000
IND20217	Swami	Maruti	Astro	Tanjavur	₹4,70,000
IND20218	Teja	Ford	Tigo	Hyderabad	₹6,80,000
IND20219	Kothai	Ford	Tigo	Tiruchy	₹7,20,000
IND20220	Lakshmi	Maruti	Astro	Coimbatore	₹4,80,000

So, what model does Ashwin have? So, here we could use the same VLOOKUP expression, copy and paste, and do some modifications. For example, the lookup array, the, the lookup value is not B 14. So, Ashwin is, the name Ashwin is available in B 2. So, you can select B 2. And then you are interested in the model that Ashwin is having. So, this model is available in the third column of this table array. So, instead of 5, let me give 3 here.

It is going to throw me an error because the table array selection has gone out of range. So, for this it is always a good practice to do referencing. So, first you select the table array and you press F 4, in case you are using windows. The moment you select F4, it is referenced. So, the table array is not going to change whenever you copy and paste.

So now let me copy and paste the same expression here, and here let me do the modifications. Instead of B 14 let me do B 2 here, and then instead of the fifth column, let me type column number three. So, this says that Ashwin is owning an S-cross. So, let us also check that. So, Ashwin has an S-cross. So, these are some of the applications of VLOOKUP. We will also look at some advanced options.

So, there are places where VLOOKUP could throw an error. So, one such error is this referencing error, so we saw how to deal with that. Whenever you use VLOOKUP always try to do the referencing so that if you copy paste the table array does not get changed.

(Refer Slide Time: 6:55)

Reg Nr	Name	Car	Model	City	Price	
IND2002	Adwin	Maruti	S-Cross	Chennai	₹ 10,00,000	How much did Mahesh pay for his car?
IND2002	Andrew	Hyundai	i10	Bangalore	₹ 6,00,000	₹ 10,00,000
IND2003	Prathmesh	Ford	EcoSport	Gurgaon	₹ 7,00,000	
IND2004	Dave	Maruti	Ciaz	Tiruchirappalli	₹ 11,00,000	
IND2005	Dave	Maruti	Astro	Pondicherry	₹ 4,50,000	
IND2006	GV	Hyundai	Creta	Bangalore	₹ 10,00,000	
IND2007	Jainini	Maruti	Astro	Gauhati	₹ 4,00,000	
IND2008	Jayakrishnan	Maruti	Brezza	Trichur	₹ 9,00,000	
IND2009	Mahesh	Maruti	S-Cross	Kanyalumattu	₹ 10,00,000	
IND2010	Malikhan	Maruti	Brezza	Trichy	₹ 9,50,000	
IND2011	Milind	Hyundai	Creta	Bangalore	₹ 10,00,000	
IND2012	Omkar	Ford	Figo	Mumbai	₹ 7,00,000	
IND2013	Balaji	Hyundai	Creta	Mumbai	₹ 18,00,000	
IND2014	Priya	Ford	Figo	Chennai	₹ 7,20,000	
IND2015	Ramkrishnan	Hyundai	Creta	Chennai	₹ 10,00,000	
IND2016	Sanket	Hyundai	i10	Chennai	₹ 6,00,000	
IND2017	Suresh	Maruti	Astro	Tajpur	₹ 4,20,000	
IND2018	Teja	Ford	Figo	Hyderabad	₹ 6,00,000	
IND2019	Kothai	Ford	Figo	Trichy	₹ 7,00,000	
IND2020	Lakshmi	Maruti	Astro	Coimbatore	₹ 4,60,000	



Reg Nr	Age of the Car	Mileage
IND2020	10	18
IND2019	4	9
IND2020	4	9
IND2021	9	12
IND2026	5	17
IND2025	4	11
IND2024	7	16
IND2013	10	16
IND2012	10	8
IND2021	7	10
IND2020	9	15
IND2029	10	13
IND2028	4	17
IND2027	3	11
IND2026	3	19
IND2025	4	15
IND2024	9	17
IND2023	8	8
IND2022	8	12
IND2020	6	15



Reg Nr	Name	Car	Model	City	Price	Age of the Car	Mileage
IND2001	Ashwin	Maruti	S-Cross	Chennai	₹10,00,000	=VLOOKUP(A2, Age_Milage, 6)	How much did Mahesh pay for his car?
IND2002	Andrew	Hyundai	i10	Bangalore	₹6,00,000		
IND2003	Bharathi	Ford	Tigo	Coimbatore	₹7,10,000		
IND2004	Elton	Maruti	Car	Trivandrum	₹11,00,000		
IND2005	Dinesh	Maruti	Alto	Pondicherry	₹4,50,000		
IND2006	GV	Hyundai	Creta	Bangalore	₹9,00,000		
IND2007	Jamil	Maruti	Alto	Gauhati	₹4,00,000		
IND2008	Jayalakshmi	Maruti	Bezza	Tiruchir	₹9,20,000		
IND2009	Mahesh	Maruti	S-Cross	Kanyakumari	₹10,00,000		
IND2010	Makleen	Maruti	Bezza	Tiruchy	₹9,30,000		
IND2011	Milind	Hyundai	Creta	Bangalore	₹10,00,000		
IND2012	Omkar	Ford	Tigo	Mumbai	₹7,20,000		
IND2013	Balaji	Hyundai	Creta	Mumbai	₹18,00,000		
IND2014	Priya	Ford	Tigo	Chennai	₹7,22,000		
IND2015	Srinivasan	Hyundai	Creta	Tanjore	₹9,80,000		
IND2016	Srinivasu	Hyundai	i10	Chennai	₹6,70,000		
IND2017	Swami	Maruti	Alto	Tanjore	₹4,70,000		
IND2018	Teja	Ford	Tigo	Hyderabad	₹6,00,000		
IND2019	Kothai	Ford	Tigo	Tiruchy	₹7,00,000		
IND2020	Lakshmi	Maruti	Alto	Coimbatore	₹4,80,000		

Reg Nr	Name	Car	Model	City	Price	Age of the Car	Mileage
IND2001	Ashwin	Maruti	S-Cross	Chennai	₹10,00,000	=VLOOKUP(A2, Age_Milage, 6)	How much did Mahesh pay for his car? ₹10,40,000
IND2002	Andrew	Hyundai	i10	Bangalore	₹6,00,000		
IND2003	Bharathi	Ford	Tigo	Coimbatore	₹7,10,000		
IND2004	Elton	Maruti	Car	Trivandrum	₹11,00,000		
IND2005	Dinesh	Maruti	Alto	Pondicherry	₹4,50,000		
IND2006	GV	Hyundai	Creta	Bangalore	₹9,00,000		
IND2007	Jamil	Maruti	Alto	Gauhati	₹4,00,000		
IND2008	Jayalakshmi	Maruti	Bezza	Tiruchir	₹9,20,000		
IND2009	Mahesh	Maruti	S-Cross	Kanyakumari	₹10,00,000		
IND2010	Makleen	Maruti	Bezza	Tiruchy	₹9,30,000		
IND2011	Milind	Hyundai	Creta	Bangalore	₹10,00,000		
IND2012	Omkar	Ford	Tigo	Mumbai	₹7,20,000		
IND2013	Balaji	Hyundai	Creta	Mumbai	₹18,00,000		
IND2014	Priya	Ford	Tigo	Chennai	₹7,22,000		
IND2015	Srinivasan	Hyundai	Creta	Tanjore	₹9,80,000		
IND2016	Srinivasu	Hyundai	i10	Chennai	₹6,70,000		
IND2017	Swami	Maruti	Alto	Tanjore	₹4,70,000		
IND2018	Teja	Ford	Tigo	Hyderabad	₹6,00,000		
IND2019	Kothai	Ford	Tigo	Tiruchy	₹7,00,000		
IND2020	Lakshmi	Maruti	Alto	Coimbatore	₹4,80,000		

So, now let us do some more calculations with VLOOKUP. So, let me, so here the primary key is registration number. So, it is a hypothetical car registration number, which has IND 2001 to IND 2020, and in the next table you have the registration number, age of the car, and mileage of the car. Suppose you want that information in this particular sheet, say basic, what you do is you create a new column, age of the car, and then mileage.

So, now you do the VLOOKUP operation. So, to find the age of the car, I will type VLOOKUP, so the moment I type v1, I am going to get an auto suggestion for VLOOKUP. You can press tab or double click. Click on the lookup value, go to the next sheet and select the table array and

then, here we want the second column, since age of the car is available in the second column. And then we are also interested in the exact match.

So now, if you type it is going to show age of the car is 6 for the registration number IND 2001.

So, here one thing I have not done is referencing. So, whenever you want to copy paste the VLOOKUP for multiple cells, always reference it.

(Refer Slide Time: 8:11)

Reg Nr	Name	Car	Model	City	Price	Age of the Car	Milage
IND2001	Ashwin	Maruti	S-Cross	Chennai	₹10,00,000	6	
IND2002	Andrew	Hyundai	Tucson	Bangalore	₹12,00,000	8	
IND2003	Bharathi	Ford	Figo	Coimbatore	₹7,20,000	8	
IND2004	Dinesh	Maruti	Ciaz	Trivandrum	₹11,00,000	9	
IND2005	Dinesh	Maruti	Alto	Pondicherry	₹4,50,000	4	
IND2006	GV	Hyundai	Creta	Bangalore	₹10,00,000	3	
IND2007	Jaimini	Maruti	Alto	Gauhati	₹4,60,000	3	
IND2008	Jayakrishnan	Maruti	Brezza	Trichur	₹9,80,000	4	
IND2009	Mallesh	Maruti	S-Cross	Kunyalluram	₹10,00,000	10	
IND2010	Makarun	Maruti	Brezza	Trichy	₹9,30,000	9	
IND2011	Milind	Hyundai	Creta	Bangalore	₹10,00,000	7	
IND2012	Omkar	Ford	Figo	Mumbai	₹7,20,000	10	
IND2013	Balaji	Hyundai	Creta	Mumbai	₹18,00,000	10	
IND2014	Praveen	Ford	Figo	Mumbai	₹7,20,000	7	
IND2015	Srinivasan	Hyundai	Creta	Tajpur	₹9,80,000	4	
IND2016	Srinivas	Hyundai	Alto	Chennai	₹6,70,000	5	
IND2017	Suresh	Maruti	Alto	Tajpur	₹4,20,000	9	
IND2018	Teja	Ford	Figo	Hyderabad	₹6,90,000	4	
IND2019	Kothai	Ford	Figo	Trichy	₹7,00,000	4	
IND2020	Lokesh	Maruti	Alto	Coimbatore	₹4,60,000	IN/A	

So, click on the table array press F 4, then press enter. And now if you drag this all the way it is going to return some value. So, now if you see here, there is an error. So, before that let us do some spot checks. Let us look at the age of the car for Malolan. So, it says 9 here. Let us go to the next sheet, and check for age of the car.

So, since Malolan is not the primary key, we will have to check with the primary key, which is, which is 2010, IND 2010. So, IND 2010 here shows 9. So, let us again verify that. It is correctly showing 9.

So, let us do another spot check. We have Kothai here. So, IND 2020, IND 2019 is having a value of 4 in the age of the car column. So, let us check for IND 2019. It says 4. So, which

means the VLOOKUP is working well. But for IND 2020 we are not getting a result. There is some mistake in IND 2020. So, let us check what the mistake is.

(Refer Slide Time: 9:45)

Reg Nr	Name	Car	Model	City	Price	Age of the Car	Mileage
IND20201	Ashwin	Maruti	S-Cross	Chennai	₹ 10,40,000	6	
IND20202	Andrew	Hyundai	i10	Bangalore	₹ 6,70,000	8	
IND20203	Bharath	Ford	Figo	Coimbatore	₹ 7,20,000	8	
IND20204	Bharat	Maruti	GZT	Tirunelveli	₹ 11,00,000	9	
IND20205	Biju	Maruti	Punto	Bangalore	₹ 14,50,000	4	
IND20206	GV	Hyundai	Creta	Bangalore	₹ 10,60,000	3	
IND20207	Jainini	Maruti	Alto	Gauhati	₹ 4,60,000	3	
IND20208	Jayakrishnan	Maruti	Brezza	Trichur	₹ 9,30,000	4	
IND20209	Mahesh	Maruti	S-Cross	Kanyakumari	₹ 10,60,000	10	
IND20210	Malakan	Maruti	Brezza	Trichy	₹ 9,50,000	9	
IND20211	Milind	Hyundai	Creta	Bangalore	₹ 10,60,000	7	
IND20212	Omkar	Ford	Figo	Mumbai	₹ 7,20,000	10	
IND20213	Balaji	Hyundai	Creta	Mumbai	₹ 18,00,000	10	
IND20214	Priya	Ford	Figo	Chennai	₹ 7,20,000	7	
IND20215	Srinivasan	Hyundai	Creta	Bangalore	₹ 9,60,000	4	
IND20216	Suresh	Maruti	Alto	Chennai	₹ 6,70,000	5	
IND20217	Suresh	Maruti	Alto	Tajpur	₹ 4,20,000	9	
IND20218	Teja	Ford	Figo	Hyderabad	₹ 6,60,000	4	
IND20219	Kothai	Ford	Figo	Trichy	₹ 7,20,000	4	
IND20220	Iacobini	Maruti	Alto	Coimbatore	₹ 14,60,000	1, Age_Milage^2	

So first, it is taking up the correct lookup value which is A 21, so A 21 is correct. And then the lookup array is also correct. It is between A 2 to C 21, and it is referenced. And then it is looking at the second column, which is also correct, and it is asking for an exact match, that is, false. So, everything seems to be correct.

(Refer Slide Time: 10:11)

Reg Nr	Age of the Car	Mileage
IND20201	10	18
IND20202	4	9
IND20203	4	9
IND20204	9	13
IND20205	5	17
IND20206	4	11
IND20207	7	16
IND20208	10	16
IND20209	10	8
IND20210	7	10
IND20211	9	15
IND20212	10	13
IND20213	4	17
IND20214	3	11
IND20215	3	19
IND20216	4	15
IND20217	9	17
IND20218	8	8
IND20219	8	17
IND20220	6	15

So, let us go to the age underscore mileage and check what the problem is. If you double click here, there are some extra spaces. So, this is called white space. So, VLOOKUP, since we are using an exact match, VLOOKUP is going to throw an error in this case. So, therefore you have couple of alternatives. Instead of an exact match you could tell VLOOKUP that I am looking for an approximate match.

(Refer Slide Time: 10:29)

Reg No	Name	Car	Model	City	Price	Age of the car	Mileage
IND20201	Ashwin	Maruti	S-Cross	Chennai	₹10,00,000	6	How much did Mahesh pay for his car?
IND20202	Andrew	Hyundai	I10	Bangalore	₹16,00,000	8	₹10,40,000
IND20203	Bharathi	Ford	Tigo	Coimbatore	₹7,50,000	8	
IND20204	Dheer	Maruti	Ciaz	Trivandrum	₹11,00,000	9	
IND20205	Dinesh	Maruti	Alto	Pondicherry	₹4,50,000	4	What model does Ashwin have?
IND20206	GV	Hyundai	Creta	Bangalore	₹10,00,000	3	S-Cross
IND20207	Jainini	Maruti	Alto	Gauhati	₹4,40,000	3	
IND20208	Jayakrishnan	Maruti	Brezza	Trichur	₹9,80,000	4	
IND20209	Mallesh	Maruti	S-Cross	Kanyakumari	₹10,40,000	10	
IND202010	Malakan	Maruti	Brezza	Trichy	₹9,00,000	9	
IND202011	Milind	Hyundai	Creta	Bangalore	₹10,00,000	7	
IND202012	Naveen	Ford	Tigo	Mumbai	₹7,20,000	10	
IND202013	Balaji	Hyundai	Creta	Mumbai	₹10,00,000	10	
IND202014	Priya	Ford	Tigo	Chennai	₹7,20,000	7	
IND202015	Srinivasan	Hyundai	Creta	Tajjore	₹9,00,000	4	
IND202016	Srinivas	Hyundai	Creta	Chennai	₹6,70,000	5	
IND202017	Swami	Maruti	Alto	Tajjore	₹4,70,000	9	
IND202018	Teja	Ford	Tigo	Hyderabad	₹6,80,000	4	
IND202019	Kothai	Ford	Tigo	Trichy	₹7,00,000	4	
IND202020	Lakshmi	Maruti	Alto	Coimbatore	₹4,60,000	2	₹5,521,270

Reg No	Name	Car	Model	City	Price	Age of the car	Mileage
IND20201	Ashwin	Maruti	S-Cross	Chennai	₹10,00,000	6	How much did Mahesh pay for his car?
IND20202	Andrew	Hyundai	I10	Bangalore	₹16,00,000	8	₹10,40,000
IND20203	Bharathi	Ford	Tigo	Coimbatore	₹7,50,000	8	
IND20204	Dheer	Maruti	Ciaz	Trivandrum	₹11,00,000	9	
IND20205	Dinesh	Maruti	Alto	Pondicherry	₹4,50,000	4	What model does Ashwin have?
IND20206	GV	Hyundai	Creta	Bangalore	₹10,00,000	3	S-Cross
IND20207	Jainini	Maruti	Alto	Gauhati	₹4,40,000	3	
IND20208	Jayakrishnan	Maruti	Brezza	Trichur	₹9,80,000	4	
IND20209	Mallesh	Maruti	S-Cross	Kanyakumari	₹10,40,000	10	
IND202010	Malakan	Maruti	Brezza	Trichy	₹9,00,000	9	
IND202011	Milind	Hyundai	Creta	Bangalore	₹10,00,000	7	
IND202012	Naveen	Ford	Tigo	Mumbai	₹7,20,000	10	
IND202013	Balaji	Hyundai	Creta	Mumbai	₹10,00,000	10	
IND202014	Priya	Ford	Tigo	Chennai	₹7,20,000	7	
IND202015	Srinivasan	Hyundai	Creta	Tajjore	₹9,00,000	4	
IND202016	Srinivas	Hyundai	Creta	Chennai	₹6,70,000	5	
IND202017	Swami	Maruti	Alto	Tajjore	₹4,70,000	9	
IND202018	Teja	Ford	Tigo	Hyderabad	₹6,80,000	4	
IND202019	Kothai	Ford	Tigo	Trichy	₹7,00,000	4	
IND202020	Lakshmi	Maruti	Alto	Coimbatore	₹4,60,000	2	6

So, for that you could type true. In that case you are going to get the correct value which is 6. But I would not recommend this kind of operation.

(Refer Slide Time: 10:45)

The screenshot shows two Microsoft Excel windows side-by-side, both titled "Basic\_Age\_Milage".

**Top Window:** This window displays a simple table with columns: Reg Nr, Age of the Car, and Milage. The data consists of 21 rows of vehicle information.

Reg Nr	Age of the Car	Milage
IND0208	10	18
IND0209	4	9
IND0210	4	9
IND0211	9	13
IND0216	5	17
IND0215	4	11
IND0214	7	16
IND0213	10	16
IND0212	10	8
IND0211	7	10
IND0209	9	15
IND0209	10	13
IND0208	4	17
IND0207	3	11
IND0206	2	9
IND0205	4	15
IND0204	9	17
IND0203	8	8
IND0202	8	17
IND0201	6	15

**Bottom Window:** This window shows the same data but includes a formula in column G: =VLOOKUP(A2, Age\_Milige!\$A\$2:\$C\$21,2). The formula is highlighted in green, indicating it is selected.

Reg Nr	Name	Car	Model	City	Age (in years)	milage (in km)	Price (in ₹)
IND0208	Ashwin	Maruti	S-Cross	Chennai	10	18	₹10,00,000
IND0209	Andrew	Hyundai	i10	Bangalore	6	9	₹6,70,000
IND0203	Bharath	Ford	Figo	Coimbatore	7	10	₹7,19,000
IND0205	Adarsh	Maruti	Alto	Pondicherry	12	13	₹4,50,000
IND0206	Dinesh	Maruti	Alto	Pondicherry	14	15	₹4,50,000
IND0207	Jainini	Maruti	Alto	Gauhati	4	8	₹4,00,000
IND0208	Jayalakshmi	Maruti	Brezza	Trichur	9	9	₹9,30,000
IND0209	Mahesh	Maruti	S-Cross	Kanyalumattu	10	10	₹10,00,000
IND0210	Malakan	Maruti	Brezza	Trichy	9	9	₹9,30,000
IND0211	Milind	Hyundai	Creta	Bangalore	7	17	₹10,00,000
IND0212	Omkar	Ford	Figo	Mumbai	7	10	₹7,00,000
IND0213	Balaji	Hyundai	Creta	Mumbai	10	10	₹18,00,000
IND0214	Princy	Ford	Figo	Chennai	7	27	₹7,27,000
IND0215	Srinivasan	Hyundai	Creta	Tajpur	4	9	₹10,00,000
IND0216	Subrata	Maruti	Alto	Uttamkanda	5	17	₹6,70,000
IND0217	Suresh	Maruti	Alto	Tajpur	4	10	₹4,00,000
IND0218	Teja	Ford	Figo	Hyderabad	6	8	₹6,80,000
IND0219	Kothai	Ford	Figo	Trichy	4	10	₹7,00,000
IND0220	Iacobhi	Maruti	Alto	Coimbatore	10	10	₹4,60,000



A screenshot of a Microsoft Excel spreadsheet titled "IND 2020". The data is organized into columns: Reg Nr, Name, Car, Model, City, Price, Age of the Car, and Mileage. Row 2 contains the header information. Rows 3 through 21 list individual entries. Row 22 is blank. Row 23 contains the formula =VLOOKUP(A2,IND2020!\$A:\$H,8,0). Row 24 contains the formula =IND2020!\$G\$1. Row 25 contains the formula =IND2020!\$F\$1. Row 26 contains the formula =IND2020!\$E\$1. Row 27 contains the formula =IND2020!\$D\$1. Row 28 contains the formula =IND2020!\$C\$1. Row 29 contains the formula =IND2020!\$B\$1. Row 30 contains the formula =IND2020!\$A\$1. Row 31 contains the formula =IND2020!\$H\$1.

Reg Nr	Name	Car	Model	City	Price	Age of the Car	Mileage
IND20201	Ashwin	Maruti	S-Cross	Chennai	₹ 10,00,000	6	
IND20202	Andrew	Hyundai	i10	Bangalore	₹ 6,00,000	8	
IND20203	Bharath	Ford	Tigo	Coimbatore	₹ 7,50,000	8	
IND20204	Elan	Maruti	Gstar	Trivandrum	₹ 11,00,000	9	
IND20205	Dinesh	Maruti	Astro	Pondicherry	₹ 4,50,000	4	
IND20206	GV	Hyundai	Creta	Bangalore	₹ 9,00,000	3	
IND20207	Jaini	Maruti	Alto	Gauhati	₹ 4,00,000	3	
IND20208	Jayakrishnan	Maruti	Brezza	Trichur	₹ 9,50,000	4	
IND20209	Mahesh	Maruti	S-Cross	Kanyakumari	₹ 10,00,000	10	
IND202010	Malikhan	Maruti	Brezza	Trichy	₹ 9,50,000	9	
IND202011	Milind	Hyundai	Creta	Bangalore	₹ 10,00,000	7	
IND202012	Omkar	Ford	Tigo	Mumbai	₹ 7,20,000	10	
IND202013	Balaji	Hyundai	Creta	Mumbai	₹ 18,00,000	10	
IND202014	Priya	Ford	Tigo	Chennai	₹ 7,20,000	7	
IND202015	Srinivasan	Hyundai	Creta	Tanjore	₹ 9,80,000	4	
IND202016	Srinivas	Hyundai	i10	Chennai	₹ 6,70,000	5	
IND202017	Swami	Maruti	Astro	Tanjore	₹ 4,70,000	9	
IND202018	Teja	Ford	Tigo	Hyderabad	₹ 6,90,000	4	
IND202019	Kothai	Ford	Tigo	Trichy	₹ 7,20,000	4	
IND202020	Lokhmi	Maruti	Astro	Coimbatore	₹ 4,60,000	10	

The better way is to remove the white space from IND 2020. Go to basic, and instead of true, stick to the original way of writing which is 0. So, now it is going to say 10. You could use the same logic, do another VLOOKUP for getting the mileage of the cars.

(Refer Slide Time: 11:15)



A screenshot of a Microsoft Excel spreadsheet titled "IND 2020". The data is organized into columns: Reg Nr, Name, Car, Model, City, Price, Age of the Car, and Mileage. Row 2 contains the header information. Rows 3 through 21 list individual entries. Row 22 is blank. Row 23 contains the formula =VLOOKUP(A2,IND2020!\$A:\$H,8,0). Row 24 contains the formula =IND2020!\$G\$1. Row 25 contains the formula =IND2020!\$F\$1. Row 26 contains the formula =IND2020!\$E\$1. Row 27 contains the formula =IND2020!\$D\$1. Row 28 contains the formula =IND2020!\$C\$1. Row 29 contains the formula =IND2020!\$B\$1. Row 30 contains the formula =IND2020!\$A\$1. Row 31 contains the formula =IND2020!\$H\$1.

Reg Nr	Name	Car	Model	City	Price	Age of the Car	Mileage
IND20201	Ashwin	Maruti	S-Cross	Chennai	₹ 10,00,000	6	
IND20202	Andrew	Hyundai	i10	Bangalore	₹ 6,00,000	8	
IND20203	Bharath	Ford	Tigo	Coimbatore	₹ 7,50,000	8	
IND20204	Elan	Maruti	Gstar	Trivandrum	₹ 11,00,000	9	
IND20205	Dinesh	Maruti	Astro	Pondicherry	₹ 4,50,000	4	
IND20206	GV	Hyundai	Creta	Bangalore	₹ 9,00,000	3	
IND20207	Jaini	Maruti	Alto	Gauhati	₹ 4,00,000	3	
IND20208	Jayakrishnan	Maruti	Brezza	Trichur	₹ 9,50,000	4	
IND20209	Mahesh	Maruti	S-Cross	Kanyakumari	₹ 10,00,000	10	
IND202010	Malikhan	Maruti	Brezza	Trichy	₹ 9,50,000	9	
IND202011	Milind	Hyundai	Creta	Bangalore	₹ 10,00,000	7	
IND202012	Omkar	Ford	Tigo	Mumbai	₹ 7,20,000	10	
IND202013	Balaji	Hyundai	Creta	Mumbai	₹ 18,00,000	10	
IND202014	Priya	Ford	Tigo	Chennai	₹ 7,20,000	7	
IND202015	Srinivasan	Hyundai	Creta	Tanjore	₹ 9,80,000	4	
IND202016	Srinivas	Hyundai	i10	Chennai	₹ 6,70,000	5	
IND202017	Swami	Maruti	Astro	Tanjore	₹ 4,70,000	9	
IND202018	Teja	Ford	Tigo	Hyderabad	₹ 6,90,000	4	
IND202019	Kothai	Ford	Tigo	Trichy	₹ 7,20,000	4	
IND202020	Lokhmi	Maruti	Astro	Coimbatore	₹ 4,60,000	10	

Reg Nr Name Car Model City Price Age of the Car Milage

Reg Nr	Name	Car	Model	City	Price	Age of the Car	Milage
IN00201	Aswin	Maruti	S-Cross	Chennai	₹1,80,000	6	VLOOKUP(A2/Age,Milage\$A\$2:\$C\$13,1)
IN00202	Andrew	Hyundai	I10	Bangalore	₹6,40,000	8	VLOOKUP(A2/Age,Milage\$A\$2:\$C\$13,2)
IN00203	Aravindh	Ford	Eco	Coimbatore	₹7,15,000	8	VLOOKUP(A2/Age,Milage\$A\$2:\$C\$13,3)
IN00204	Dinesh	Maruti	Ciaz	Trivandrum	₹11,00,000	9	
IN00205	Dinesh	Maruti	Astro	Pondicherry	₹4,50,000	4	
IN00206	GV	Hyundai	Creta	Bengaluru	₹10,60,000	3	What model does Aswin have?
IN00207	Jaimini	Maruti	Alto	Gauhati	₹4,40,000	3	
IN00208	Jayakrishnan	Maruti	Brezza	Trichur	₹9,18,000	4	
IN00209	Malhech	Maruti	S-Cross	Kanyakumari	₹10,40,000	10	
IN00210	Malikun	Maruti	Brezza	Trichy	₹9,10,000	9	
IN00211	Milind	Hyundai	Creta	Bangalore	₹10,00,000	7	
IN00212	Omkar	Ford	Figo	Mumbai	₹7,20,000	10	
IN00213	Balaji	Hyundai	Creta	Mumbai	₹18,00,000	10	
IN00214	Priya	Ford	Figo	Chennai	₹7,27,000	7	
IN00215	Srinivasan	Hyundai	Creta	Tajpur	₹9,00,000	4	
IN00216	Suresh	Maruti	Alto	Chennai	₹6,71,000	5	
IN00217	Suresh	Maruti	Alto	Tajpur	₹6,70,000	9	
IN00218	Teja	Ford	Figo	Hyderabad	₹6,90,000	4	
IN00219	Kothai	Ford	Figo	Trichy	₹7,00,000	6	
IN00220	Lakshmi	Maruti	Alto	Coimbatore	₹4,60,000	10	

Basic Age\_Milage

IIIT Madras  
BSc Degree



How much did Mahesh pay for his car?  
₹ 10,40,000

What model does Ashwin have?  
S-Cross

Reg Nr	Name	Car	Model	City	Price	Age of the Car	Mileage
IN02002	Ashwin	Maruti	S-Cross	Chennai	₹ 10,00,000	6	15
IN02002	Andrew	Hyundai	i10	Bangalore	₹ 6,00,000	8	17
IN02003	Bharathi	Ford	Tigo	Coimbatore	₹ 7,50,000	8	17
IN02004	Dinesh	Maruti	Ciaz	Trivandrum	₹ 11,00,000	9	17
IN02005	Dinesh	Maruti	Alto	Pondicherry	₹ 4,50,000	4	15
IN02006	GV	Hyundai	Creta	Bangalore	₹ 9,00,000	3	16
IN02007	Jainini	Ford	Tigo	Gauhati	₹ 4,00,000	3	16
IN02008	Jayalakshmi	Maruti	Brezza	Trichur	₹ 9,50,000	4	17
IN02009	Mahesh	Maruti	S-Cross	Kanyakumari	₹ 10,00,000	10	13
IN02010	Malolan	Maruti	Brezza	Trichy	₹ 9,50,000	9	15
IN02011	Milind	Hyundai	Creta	Bangalore	₹ 10,00,000	7	10
IN02012	Omkar	Ford	Tigo	Mumbai	₹ 7,20,000	10	16
IN02013	Balaji	Hyundai	Creta	Mumbai	₹ 18,00,000	10	16
IN02014	Priya	Ford	Tigo	Chennai	₹ 7,20,000	7	16
IN02015	Srinivasan	Hyundai	Creta	Tajpur	₹ 9,80,000	4	11
IN02016	Srinivasan	Hyundai	i10	Chennai	₹ 6,70,000	5	17
IN02017	Swami	Maruti	Alto	Tajpur	₹ 4,70,000	9	13
IN02018	Teja	Ford	Tigo	Hyderabad	₹ 6,80,000	4	16
IN02019	Kothai	Ford	Tigo	Trichy	₹ 7,00,000	4	9
IN02020	Lakshmi	Maruti	Alto	Coimbatore	₹ 4,80,000	10	18

So, I am selecting the lookup value to be A 2, then go to age underscore mileage, select the table array, and then as usual reference it with F 4, and then I am looking at the third column of the table array, and then I look for an exact match. So, now it is going to show me 15 as the car mileage, again couple of spot checks. Let us do it for Lakshmi.

(Refer Slide Time: 11:43)

How much did Mahesh pay for his car?  
₹ 10,40,000

What model does Ashwin have?  
S-Cross

Reg Nr	Name	Car	Model	City	Price	Age of the Car	Mileage
IN02002	Ashwin	Maruti	S-Cross	Chennai	₹ 10,00,000	6	15
IN02002	Andrew	Hyundai	i10	Bangalore	₹ 6,00,000	8	17
IN02003	Bharathi	Ford	Tigo	Coimbatore	₹ 7,50,000	8	17
IN02004	Dinesh	Maruti	Ciaz	Trivandrum	₹ 11,00,000	9	17
IN02005	Dinesh	Maruti	Alto	Pondicherry	₹ 4,50,000	4	15
IN02006	GV	Hyundai	Creta	Bangalore	₹ 9,00,000	3	19
IN02007	Jainini	Maruti	Alto	Gauhati	₹ 4,00,000	3	11
IN02008	Jayalakshmi	Maruti	Brezza	Trichur	₹ 9,50,000	4	17
IN02009	Mahesh	Maruti	S-Cross	Kanyakumari	₹ 10,00,000	10	13
IN02010	Malolan	Maruti	Brezza	Trichy	₹ 9,50,000	9	15
IN02011	Milind	Hyundai	Creta	Bangalore	₹ 10,00,000	7	10
IN02012	Omkar	Ford	Tigo	Mumbai	₹ 7,20,000	10	8
IN02013	Balaji	Hyundai	Creta	Mumbai	₹ 18,00,000	10	16
IN02014	Priya	Ford	Tigo	Chennai	₹ 7,20,000	7	16
IN02015	Srinivasan	Hyundai	Creta	Tajpur	₹ 9,80,000	4	11
IN02016	Srinivasan	Hyundai	i10	Chennai	₹ 6,70,000	5	17
IN02017	Swami	Maruti	Alto	Tajpur	₹ 4,70,000	9	13
IN02018	Teja	Ford	Tigo	Hyderabad	₹ 6,80,000	4	9
IN02019	Kothai	Ford	Tigo	Trichy	₹ 7,00,000	4	9
IN02020	Lakshmi	Maruti	Alto	Coimbatore	₹ 4,80,000	10	18

Reg Nr	Age of the Car	Mileage
IND2009	10	18
IND2019	4	9
IND2018	4	9
IND2017	9	13
IND2016	5	17
IND2015	4	11
IND2014	7	16
IND2013	10	16
IND2012	10	8
IND2011	7	10
IND2010	9	15
IND2009	10	13
IND2008	4	17
IND2007	3	11
IND2006	3	19
IND2005	4	15
IND2004	9	17
IND2003	8	8
IND2002	8	17
IND2001	6	15

Reg Nr	Name	Car	Model	City	Price	Age of the Car	Mileage
IND2001	Aswin	Maruti	S-Cross	Chennai	₹10,80,000	6	15
IND2002	Andrew	Hyundai	i10	Bangalore	₹6,70,000	8	17
IND2003	Bharathi	Ford	Tigo	Coimbatore	₹7,10,000	8	8
IND2004	Dinesh	Maruti	Car	Trivandrum	₹11,00,000	9	17
IND2005	Dinesh	Maruti	Alto	Pondicherry	₹4,50,000	4	15
IND2006	GV	Hyundai	Creta	Bangalore	₹10,40,000	3	19
IND2007	Jamil	Maruti	Alto	Gauhati	₹4,40,000	3	11
IND2008	Karthik	Maruti	S-Cross	Chennai	₹9,40,000	4	17
IND2009	Mahesh	Maruti	S-Cross	Kanpur	₹10,40,000	10	13
IND2010	Malik	Maruti	Benzra	Trichy	₹9,30,000	9	15
IND2011	Milind	Hyundai	Creta	Bangalore	₹10,30,000	7	10
IND2012	Omkar	Ford	Tigo	Mumbai	₹7,20,000	10	8
IND2013	Balaji	Hyundai	Creta	Mumbai	₹18,00,000	10	16
IND2014	Phy	Ford	Tigo	Chennai	₹7,22,000	7	16
IND2015	Srinivas	Hyundai	Creta	Tanjore	₹9,80,000	4	11
IND2016	Srinivas	Hyundai	i10	Chennai	₹6,70,000	5	17
IND2017	Suman	Maruti	Alto	Tanjore	₹4,70,000	9	13
IND2018	Teja	Ford	Tigo	Hyderabad	₹6,90,000	4	9
IND2019	Kothai	Ford	Tigo	Trichy	₹7,00,000	4	9
IND2020	Lakshmi	Maruti	Alto	Coimbatore	₹4,60,000	10	18

So, IND 2020, the mileage is 18 kilometers per liter, which is correct. So, let us do it somewhere in between. IND 2007 the mileage seems to be 11 and the age of the car seems to be 3. So, 3 and 11 for 2007. So, 2007, 3 and 11 seems to work fine.

So, this is how you do VLOOKUP. And it is very handy especially when you are automating, automating on a large chunk of data. It is going to save you a lot of time. And VLOOKUP is a mandatory skill that you require when you join industry. So, with this let us move on to PIVOT TABLES.

(Refer Slide Time: 12:23)

**PivotTable**

How much did Mahesh pay for his car?  
₹ 10,40,000

What model does Ashwin have?  
S-Cross

Reg Nr	Name	Car	Model	City	Price	Age of the Car	Mileage
1	Ashwin	Maruti	S-Cross	Chennai	₹ 10,80,000	6	15
2	Andrew	Hyundai	i10	Bangalore	₹ 6,70,000	8	17
3	Bharath	Ford	Figo	Chennai	₹ 7,75,000	8	8
4	Manu	Maruti	Alto	Pondicherry	₹ 1,45,000	4	15
5	Dinesh	Maruti	Alto	Tanjore	₹ 1,45,000	9	17
6	Seenu	Maruti	Alto	Tanjore	₹ 4,20,000	9	11
7	GV	Hyundai	Creta	Bangalore	₹ 10,80,000	3	19
8	Jainini	Maruti	Alto	Gauhati	₹ 4,40,000	3	11
9	Jayalakshmi	Maruti	Brezza	Trichur	₹ 9,30,000	4	17
10	Mahesh	Maruti	S-Cross	Kanyakumari	₹ 10,80,000	10	13
11	Malakan	Maruti	Brezza	Trichy	₹ 9,30,000	9	15
12	Milind	Hyundai	Creta	Bangalore	₹ 10,80,000	7	10
13	Omkar	Ford	Figo	Mumbai	₹ 7,20,000	10	8
14	Balaji	Hyundai	Creta	Mumbai	₹ 18,00,000	10	16
15	Priya	Ford	Figo	Chennai	₹ 7,20,000	7	16
16	Srinivasan	Hyundai	Creta	Tanjore	₹ 9,30,000	4	11
17	Srinivas	Hyundai	i10	Chennai	₹ 6,70,000	5	17
18	Seenu	Maruti	Alto	Tanjore	₹ 4,20,000	9	11
19	Teja	Ford	Figo	Hyderabad	₹ 6,80,000	4	9
20	Kothai	Ford	Figo	Trichy	₹ 7,00,000	4	9
21	Lokhmi	Maruti	Alto	Coimbatore	₹ 4,60,000	10	18

**PivotChart**

Use PivotCharts to graphically summarize data and options complex data.

How much did Mahesh pay for his car?  
₹ 10,40,000

What model does Ashwin have?  
S-Cross

Model	Count
S-Cross	2
i10	2
Figo	4
Creta	3
Brezza	2
Alto	8
Tanjore	2
Chennai	4
Trichy	2
Hyderabad	1
Mumbai	2
Gauhati	1
Trichur	1
Kanyakumari	1
Pondicherry	1
Coimbatore	1

**Basic** | Age\_Milage |

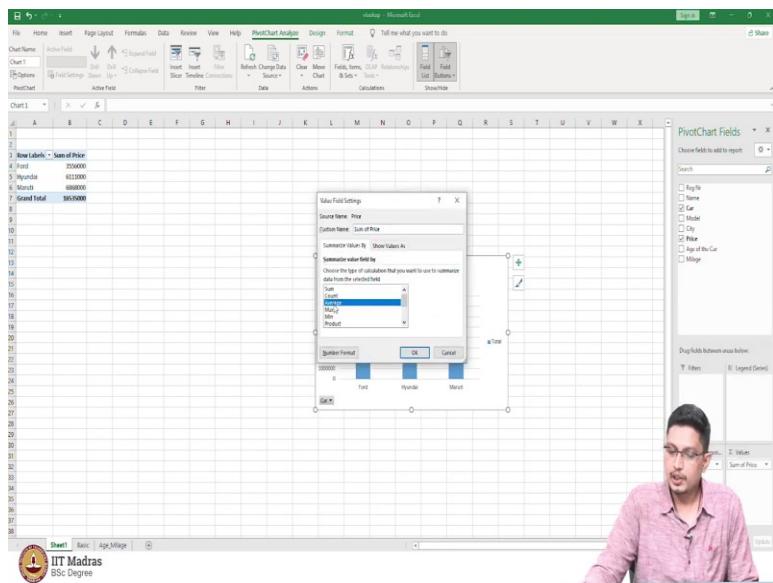
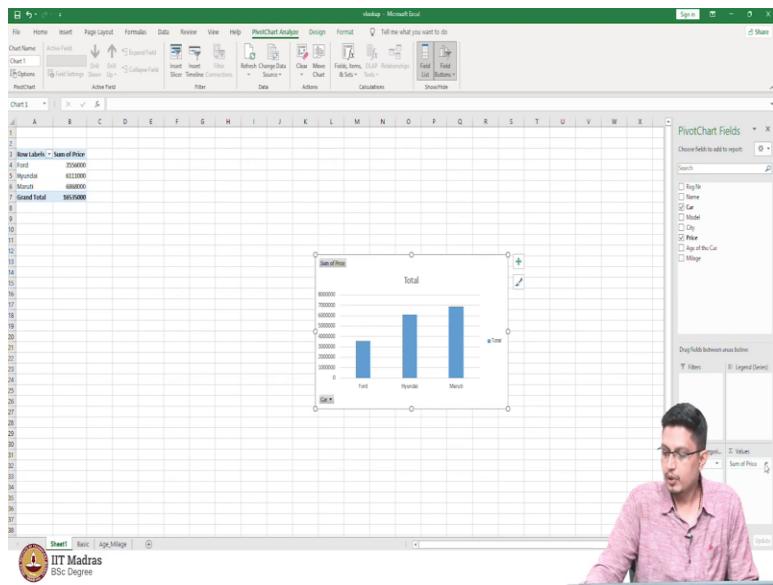
IT Madras  
BSc Degree

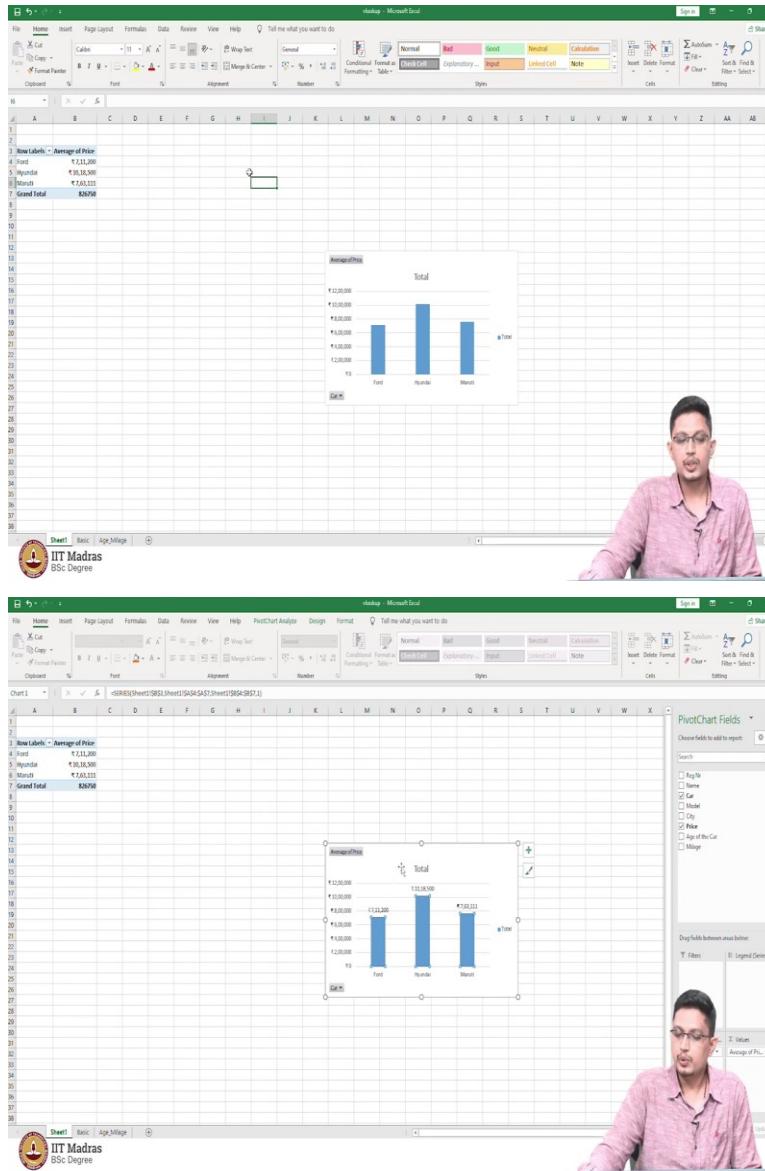
The image shows two screenshots of Microsoft Excel. The top screenshot shows a table of car data with a PivotTable created in cell A1. The table includes columns for Reg Nr, Name, Car, Model, City, Price, Age of the Car, and Mileage. A PivotTable summary is visible in the bottom right corner. The bottom screenshot shows the 'Create PivotTable' dialog box open, with the 'New Worksheet' option selected. Both screenshots have the 'IIT Madras BSc Degree' watermark.

So, I am using the same data to explain PIVOT TABLE. First let me select the entire table and then I go to insert and then you have two options to do up to a PIVOT TABLE. So, one is you can directly click on this PIVOT TABLE or you go to this setting where you have an option of selecting only a pivot chart.

You could also select a pivot chart and PIVOT TABLE. So, let me do this pivot chart and PIVOT TABLE. So, I am going to show the PIVOT TABLE in a new sheet, therefore I am going with a default setting and pressing okay.

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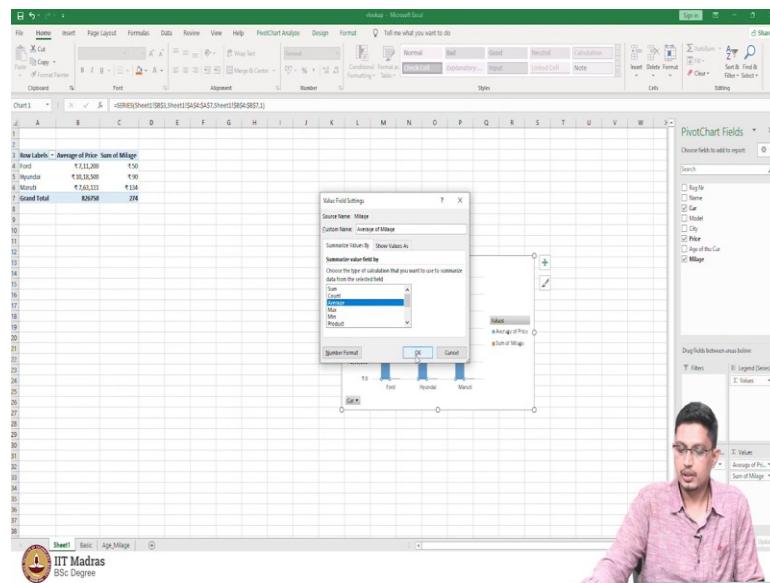
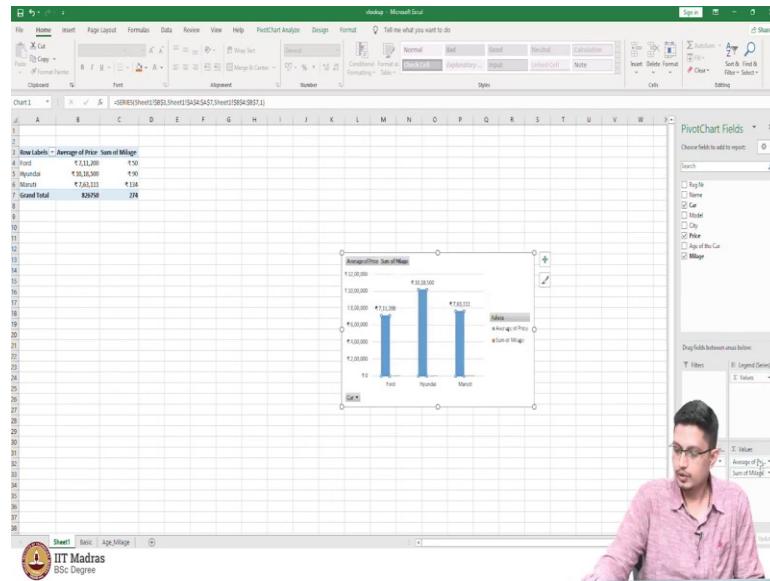


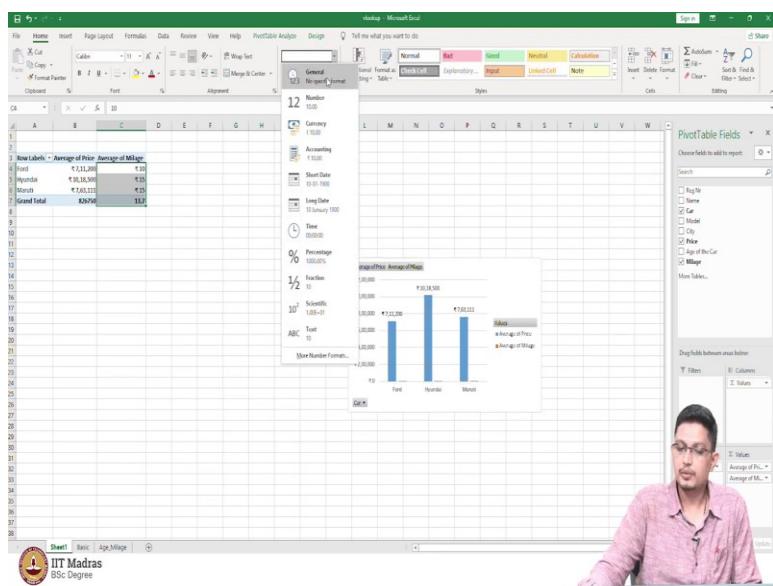
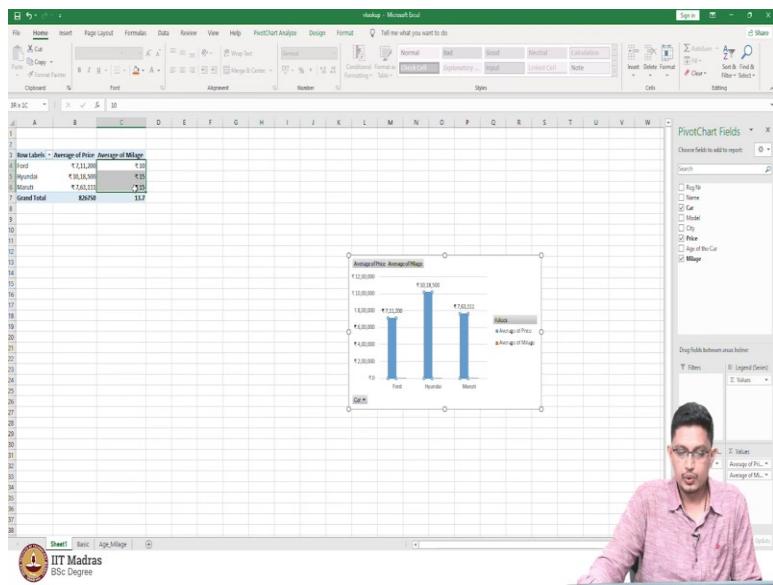
So now, let us use some categorical variables to understand how grouping is done. So, let me use variables like car. I am selecting it on the access category. So, you have three different categories, namely, Ford, Hyundai and Maruti. So, next let me drag and drop the price of these cars. So, it is going to show me the sum, but I am not interested in the sum. Let me show the average price of these cars. Let us also round it off.

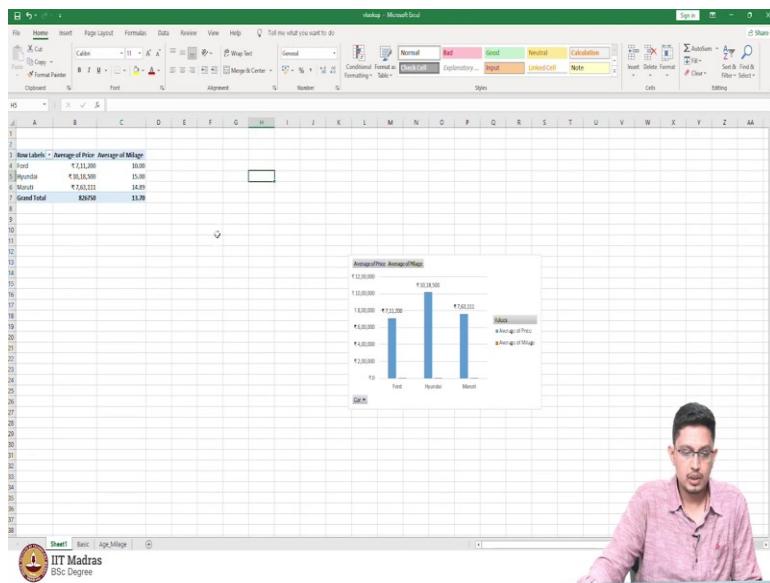
So, let us first put it to a proper currency format. So, the average price of a Ford car, according to the PIVOT TABLE is 7,11,200. And similarly, Hyundai costs around 10,18,000 and Maruti is costing around 7.6 lakhs. So, these are some of the insights you can find from PIVOT TABLES without a lot of effort.

So, it is a good practice to always have data labels on the graphs. So, this will give you a better idea of how the average price of each car looks like. And let us play with some more values.

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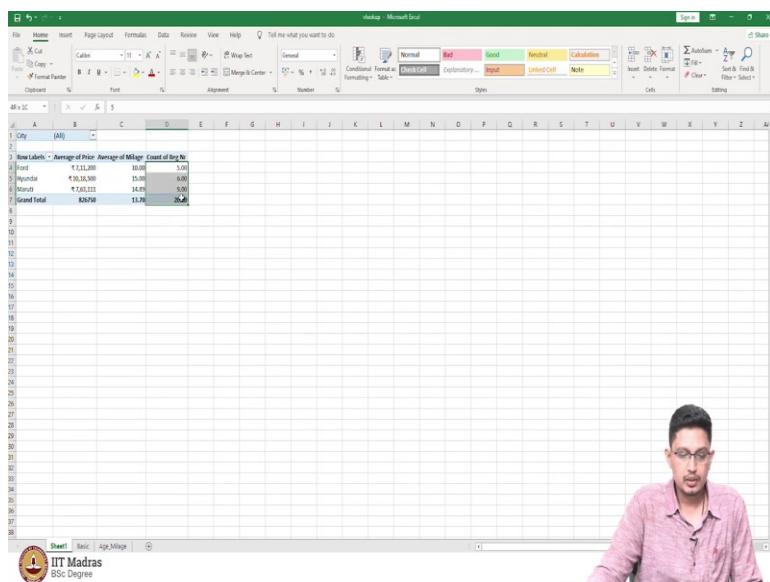


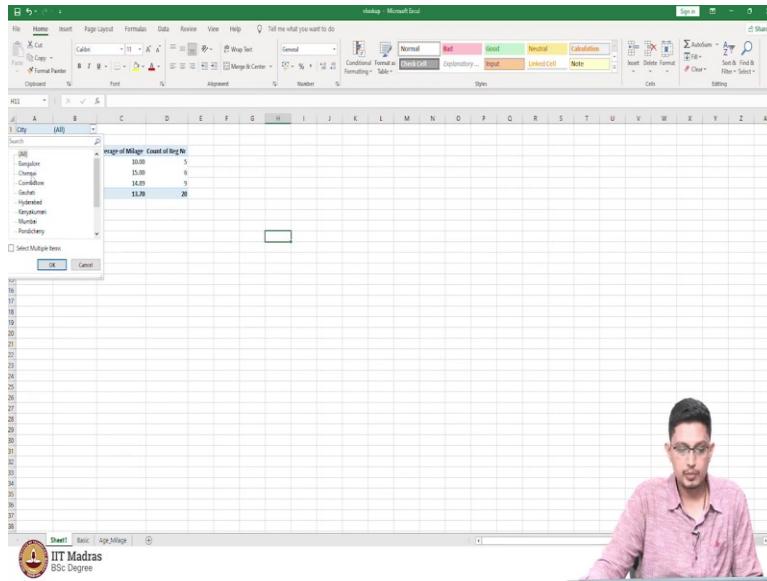


So, to this categorical variable, let me add mileage. Again I am not interested in sum of the mileage. I am going to add average, I am going to use the average setting here. So, average should not be a currency format, should not be in currency format, it should be a number.

So typically Hyundai is returning the highest mileage followed by Maruti and Ford. So, you could also see that here. And since the scales are different you are not able to see the chart here. You are not able to see the mileage in the chart here. So, therefore, let me delete this chart.

(Refer Slide Time: 15:00)





So, let us see some more things here. I could add a filter here so let me add the city as a filter here. So, we will also add the number of cars that are available under each car company. So, let us add registration number, and here count is the best thing to have. So, let us change the format to a number. Let us round it off.

So, in total there are 20 cars out of which 5 are Ford cars and 6 are Hyundai cars and 9 are Maruti cars. And generally, the average mileage of Maruti is 14.89, and you could also play with the filters. For example, if you select Chennai, 10<sup>th</sup> totally there are 3 cars pertaining to this data set and out of which one is Ford, one is Hyundai and one is Maruti.

So, these are some of the useful applications of tools like PIVOT TABLE and VLOOKUP. So, there are a lot more but these are sufficient for you people to progress in this course and with time you will be better and better with such tools in Excel. I wish you all the best and see you in the next tutorial.