



IIT Madras

ONLINE DEGREE

Statistics for Data Science - 1
Prof. Usha Mohan

Department of Management Studies
Indian Institute of Technology, Madras

Lecture - 09

Tutorial - 3

(Refer Slide Time: 00:14)

Learning Objectives for statistics week tutorials

Tutorial 3 Spreadsheet Formulae Learning Objectives

1. Understand the basic mathematical operations that can be done in a spreadsheet.
 2. Using cell reference to refer to a particular cell to do mathematical calculations
 3. Understanding how autofill happens with respect to changing the cell numbers
 4. Fixing the column or row number in the formula while giving cell reference
 5. Fixing the cell value in the autofill so autofill uses the same cell value for other cells
 6. Using Paste Special to just copy the format of cell
 7. Changing the basic inputs of the data to change the entire calculations by using cell reference

(Refer Slide Time: 00:17)

A screenshot of a Google Sheets document titled "My First Spreadsheet". The document has a single sheet named "Sheet1". The data is organized into columns A through I:

	A	B	C	D	E	F	G	H	I
1	Month	Interest to be paid for the month	Total Interest to be paid upto this month	Total Money owed upto this month					
2	March	₹0.00	₹0.00	₹10,000.00					
3	April								
4	May								
5	June								
6	July								
7	August								
8	September								
9	October								
10	November								
11	December								
12	January								
13									
14									
15									
16									
17									
18									
19									

The cell B2 contains ₹0.00. The cell D2 contains ₹10,000.00. The cell C2 is empty. The cell B3 is empty. The cell B4 is empty. The cell B5 is empty. The cell B6 is empty. The cell B7 is empty. The cell B8 is empty. The cell B9 is empty. The cell B10 is empty. The cell B11 is empty. The cell B12 is empty. The cell B13 is empty. The cell B14 is empty. The cell B15 is empty. The cell B16 is empty. The cell B17 is empty. The cell B18 is empty. The cell B19 is empty.

Principal = 10000

We have formatted the sheet in the previous video, now I have removed that data. We will look at better ways to fill in those cells. Earlier, we did it by our own calculation. But this time around, let us make the spreadsheet software do the calculations for us.

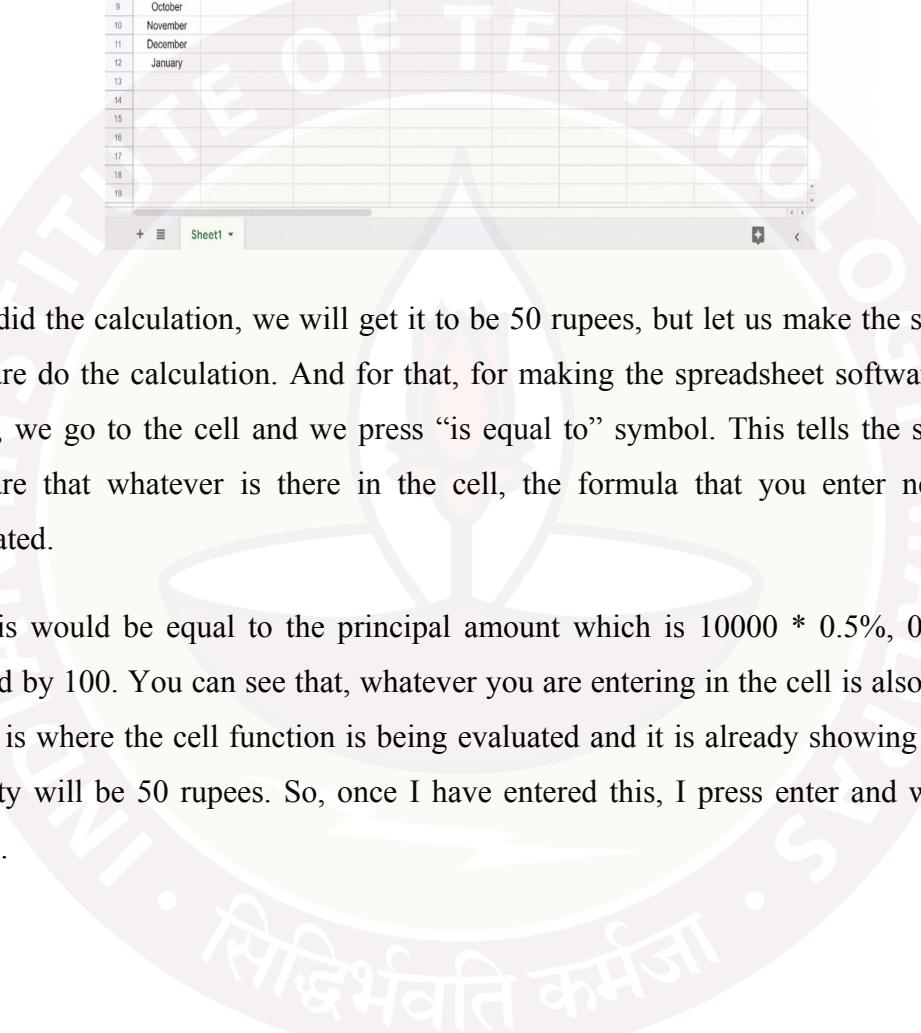
So, the initial entry here we will have to do in the month of March, there is no interest the total interest will be 0 and the principal amount which is the 10,000 rupees is what is owed up to that month and as you can see, after the formatting the rupee symbol gets added by itself.

(Refer Slide Time: 01:08)

A screenshot of a Google Sheets document titled "My First Spreadsheet". The spreadsheet has a single sheet named "Sheet1". The data is organized into columns A through I. Column A is labeled "Month" and contains the months from March to January. Column B is labeled "Interest to be paid for the month" and contains values starting from \$0.00 for March and increasing sequentially. Column C is labeled "Total Interest to be paid upto this month" and shows the cumulative sum of the interests. Column D is labeled "Total Money owed upto this month" and shows the principal amount of 10,000.00 for all months. The cell for April in column B is currently selected. A handwritten note in blue ink on the right side of the sheet states: "Rate of interest per month = 0.5%".

Month	Interest to be paid for the month	Total Interest to be paid upto this month	Total Money owed upto this month
March	\$0.00	\$0.00	₹10,000.00
April	10.00	10.00	₹10,000.00
May	20.00	30.00	₹10,000.00
June	30.00	60.00	₹10,000.00
July	40.00	100.00	₹10,000.00
August	50.00	150.00	₹10,000.00
September	60.00	210.00	₹10,000.00
October	70.00	280.00	₹10,000.00
November	80.00	360.00	₹10,000.00
December	90.00	450.00	₹10,000.00
January	100.00	550.00	₹10,000.00
February	110.00	660.00	₹10,000.00
March	120.00	780.00	₹10,000.00
April	130.00	910.00	₹10,000.00
May	140.00	1050.00	₹10,000.00
June	150.00	1200.00	₹10,000.00
July	160.00	1360.00	₹10,000.00
August	170.00	1530.00	₹10,000.00
September	180.00	1710.00	₹10,000.00
October	190.00	1890.00	₹10,000.00
November	200.00	2080.00	₹10,000.00
December	210.00	2270.00	₹10,000.00
January	220.00	2460.00	₹10,000.00
February	230.00	2650.00	₹10,000.00
March	240.00	2840.00	₹10,000.00
April	250.00	3030.00	₹10,000.00
May	260.00	3220.00	₹10,000.00
June	270.00	3410.00	₹10,000.00
July	280.00	3600.00	₹10,000.00
August	290.00	3790.00	₹10,000.00
September	300.00	3980.00	₹10,000.00
October	310.00	4170.00	₹10,000.00
November	320.00	4360.00	₹10,000.00
December	330.00	4550.00	₹10,000.00
January	340.00	4740.00	₹10,000.00
February	350.00	4930.00	₹10,000.00
March	360.00	5120.00	₹10,000.00
April	370.00	5310.00	₹10,000.00
May	380.00	5500.00	₹10,000.00
June	390.00	5690.00	₹10,000.00
July	400.00	5880.00	₹10,000.00
August	410.00	6070.00	₹10,000.00
September	420.00	6260.00	₹10,000.00
October	430.00	6450.00	₹10,000.00
November	440.00	6640.00	₹10,000.00
December	450.00	6830.00	₹10,000.00
January	460.00	7020.00	₹10,000.00
February	470.00	7210.00	₹10,000.00
March	480.00	7400.00	₹10,000.00
April	490.00	7590.00	₹10,000.00
May	500.00	7780.00	₹10,000.00
June	510.00	7970.00	₹10,000.00
July	520.00	8160.00	₹10,000.00
August	530.00	8350.00	₹10,000.00
September	540.00	8540.00	₹10,000.00
October	550.00	8730.00	₹10,000.00
November	560.00	8920.00	₹10,000.00
December	570.00	9110.00	₹10,000.00
January	580.00	9300.00	₹10,000.00
February	590.00	9490.00	₹10,000.00
March	600.00	9680.00	₹10,000.00
April	610.00	9870.00	₹10,000.00
May	620.00	10060.00	₹10,000.00
June	630.00	10250.00	₹10,000.00
July	640.00	10440.00	₹10,000.00
August	650.00	10630.00	₹10,000.00
September	660.00	10820.00	₹10,000.00
October	670.00	11010.00	₹10,000.00
November	680.00	11200.00	₹10,000.00
December	690.00	11390.00	₹10,000.00
January	700.00	11580.00	₹10,000.00
February	710.00	11770.00	₹10,000.00
March	720.00	11960.00	₹10,000.00
April	730.00	12150.00	₹10,000.00
May	740.00	12340.00	₹10,000.00
June	750.00	12530.00	₹10,000.00
July	760.00	12720.00	₹10,000.00
August	770.00	12910.00	₹10,000.00
September	780.00	13100.00	₹10,000.00
October	790.00	13290.00	₹10,000.00
November	800.00	13480.00	₹10,000.00
December	810.00	13670.00	₹10,000.00
January	820.00	13860.00	₹10,000.00
February	830.00	14050.00	₹10,000.00
March	840.00	14240.00	₹10,000.00
April	850.00	14430.00	₹10,000.00
May	860.00	14620.00	₹10,000.00
June	870.00	14810.00	₹10,000.00
July	880.00	15000.00	₹10,000.00
August	890.00	15190.00	₹10,000.00
September	900.00	15380.00	₹10,000.00
October	910.00	15570.00	₹10,000.00
November	920.00	15760.00	₹10,000.00
December	930.00	15950.00	₹10,000.00
January	940.00	16140.00	₹10,000.00
February	950.00	16330.00	₹10,000.00
March	960.00	16520.00	₹10,000.00
April	970.00	16710.00	₹10,000.00
May	980.00	16900.00	₹10,000.00
June	990.00	17090.00	₹10,000.00
July	1000.00	17280.00	₹10,000.00
August	1010.00	17470.00	₹10,000.00
September	1020.00	17660.00	₹10,000.00
October	1030.00	17850.00	₹10,000.00
November	1040.00	18040.00	₹10,000.00
December	1050.00	18230.00	₹10,000.00
January	1060.00	18420.00	₹10,000.00
February	1070.00	18610.00	₹10,000.00
March	1080.00	18800.00	₹10,000.00
April	1090.00	18990.00	₹10,000.00
May	1100.00	19180.00	₹10,000.00
June	1110.00	19370.00	₹10,000.00
July	1120.00	19560.00	₹10,000.00
August	1130.00	19750.00	₹10,000.00
September	1140.00	19940.00	₹10,000.00
October	1150.00	20130.00	₹10,000.00
November	1160.00	20320.00	₹10,000.00
December	1170.00	20510.00	₹10,000.00
January	1180.00	20700.00	₹10,000.00
February	1190.00	20890.00	₹10,000.00
March	1200.00	21080.00	₹10,000.00
April	1210.00	21270.00	₹10,000.00
May	1220.00	21460.00	₹10,000.00
June	1230.00	21650.00	₹10,000.00
July	1240.00	21840.00	₹10,000.00
August	1250.00	22030.00	₹10,000.00
September	1260.00	22220.00	₹10,000.00
October	1270.00	22410.00	₹10,000.00
November	1280.00	22600.00	₹10,000.00
December	1290.00	22790.00	₹10,000.00
January	1300.00	22980.00	₹10,000.00
February	1310.00	23170.00	₹10,000.00
March	1320.00	23360.00	₹10,000.00
April	1330.00	23550.00	₹10,000.00
May	1340.00	23740.00	₹10,000.00
June	1350.00	23930.00	₹10,000.00
July	1360.00	24120.00	₹10,000.00
August	1370.00	24310.00	₹10,000.00
September	1380.00	24500.00	₹10,000.00
October	1390.00	24690.00	₹10,000.00
November	1400.00	24880.00	₹10,000.00
December	1410.00	25070.00	₹10,000.00
January	1420.00	25260.00	₹10,000.00
February	1430.00	25450.00	₹10,000.00
March	1440.00	25640.00	₹10,000.00
April	1450.00	25830.00	₹10,000.00
May	1460.00	26020.00	₹10,000.00
June	1470.00	26210.00	₹10,000.00
July	1480.00	26400.00	₹10,000.00
August	1490.00	26590.00	₹10,000.00
September	1500.00	26780.00	₹10,000.00
October	1510.00	26970.00	₹10,000.00
November	1520.00	27160.00	₹10,000.00
December	1530.00	27350.00	₹10,000.00
January	1540.00	27540.00	₹10,000.00
February	1550.00	27730.00	₹10,000.00
March	1560.00	27920.00	₹10,000.00
April	1570.00	28110.00	₹10,000.00
May	1580.00	28300.00	₹10,000.00
June	1590.00	28490.00	₹10,000.00
July	1600.00	28680.00	₹10,000.00
August	1610.00	28870.00	₹10,000.00
September	1620.00	29060.00	₹10,000.00
October	1630.00	29250.00	₹10,000.00
November	1640.00	29440.00	₹10,000.00
December	1650.00	29630.00	₹10,000.00
January	1660.00	29820.00	₹10,000.00
February	1670.00	30010.00	₹10,000.00
March	1680.00	30200.00	₹10,000.00
April	1690.00	30390.00	₹10,000.00
May	1700.00	30580.00	₹10,000.00
June	1710.00	30770.00	₹10,000.00
July	1720.00	30960.00	₹10,000.00
August	1730.00	31150.00	₹10,000.00
September	1740.00	31340.00	₹10,000.00
October	1750.00	31530.00	₹10,000.00
November	1760.00	31720.00	₹10,000.00
December	1770.00	31910.00	₹10,000.00
January	1780.00	32100.00	₹10,000.00
February	1790.00	32290.00	₹10,000.00
March	1800.00	32480.00	₹10,000.00
April	1810.00	32670.00	₹10,000.00
May	1820.00	32860.00	₹10,000.00
June	1830.00	33050.00	₹10,000.00
July	1840.00	33240.00	₹10,000.00
August	1850.00	33430.00	₹10,000.00
September	1860.00	33620.00	₹10,000.00
October	1870.00	33810.00	₹10,000.00
November	1880.00	34000.00	₹10,000.00
December	1890.00	34190.00	₹10,000.00
January	1900.00	34380.00	₹10,000.00
February	1910.00	34570.00	₹10,000.00
March	1920.00	34760.00	₹10,000.00
April	1930.00	34950.00	₹10,000.00
May	1940.00	35140.00	₹10,000.00
June	1950.00	35330.00	₹10,000.00
July	1960.00	35520.00	₹10,000.00
August	1970.00	35710.00	₹10,000.00
September	1980.00	35900.00	₹10,000.00
October	1990.00	36090.00	₹10,000.00
November	2000.00	36280.00	₹10,000.00
December	2010.00	36470.00	₹10,000.00
January	2020.00	36660.00	₹10,000.00
February	2030.00	36850.00	₹10,000.00
March	2040.00	37040.00	₹10,000.00
April	2050.00	37230.00	₹10,000.00
May	2060.00	37420.00	₹10,000.00
June	2070.00	37610.00	₹10,000.00
July	2080.00	37800.00	₹10,000.00
August	2090.00	38090.00	₹10,000.00
September	2100.00	38280.00	₹10,000.00
October	2110.00	38470.00	₹10,000.00
November	2120.00	38660.00	₹1

(Refer Slide Time: 01:26)



A screenshot of a Google Sheets spreadsheet titled "My First Spreadsheet". The spreadsheet has a single sheet named "Sheet1". The data starts at row 1 with columns A through I. Row 1 contains the headers: "Month", "Interest to be paid for the month", "Total Interest to be paid upto this month", and "Total Money owed upto this month". Rows 2 through 12 list months from March to January. Row 3 shows "₹0.00" in column B. Row 4 shows "=B2" in column B, indicating a formula. The text "'= symbol to indicate a formula" is overlaid on the right side of the spreadsheet area.

Month	Interest to be paid for the month	Total Interest to be paid upto this month	Total Money owed upto this month					
March	₹0.00	₹0.00	₹10,000.00					
April	=							
May								
June								
July								
August								
September								
October								
November								
December								
January								
February								
March								
April								
May								
June								
July								
August								
September								
October								
November								
December								
January								
February								
March								
April								
May								
June								
July								
August								
September								
October								
November								
December								
January								
February								
March								
April								
May								
June								
July								
August								
September								
October								
November								
December								
January								
February								
March								
April								
May								
June								
July								
August								
September								
October								
November								
December								
January								
February								
March								
April								
May								
June								
July								
August								
September								
October								
November								
December								
January								
February								
March								
April								
May								
June								
July								
August								
September								
October								
November								
December								
January								
February								
March								
April								
May								
June								
July								
August								
September								
October								
November								
December								
January								
February								
March								
April								
May								
June								
July								
August								
September								
October								
November								
December								
January								
February								
March								
April								
May								
June								
July								
August								
September								
October								
November								
December								
January								
February								
March								
April								
May								
June								
July								
August								
September								
October								
November								
December								
January								
February								
March								
April								
May								
June								
July								
August								
September								
October								
November								
December								
January								
February								
March								
April								
May								
June								
July								
August								
September								
October								
November								
December								
January								
February								
March								
April								
May								
June								
July								
August								
September								
October								
November								
December								
January								
February								
March								
April								
May								
June								
July								
August								
September								
October								
November								
December								
January								
February								
March								
April								
May								
June								
July								
August								
September								
October								
November								
December								
January								
February								
March								
April								
May								
June								
July								
August								
September								
October								
November								
December								
January								
February								
March								
April								
May								
June								
July								
August								
September								
October								
November								
December								
January								
February								
March								
April								
May								
June								
July								
August								
September								
October								
November								
December								
January								
February								
March								
April								
May								
June								
July								
August								
September								
October								
November								
December								
January								
February								
March								
April								
May								
June								
July								
August								
September								
October								
November								
December								
January								
February								
March</								

(Refer Slide Time: 02:20)

Month	Interest to be paid for the month	Total Interest to be paid upto this month	Total Money owed upto this month
March	₹0.00	₹0.00	₹10,000.00
April	=10000*0.5/100		
May			
June			
July			
August			
September			
October			
November			
December			
January			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			

Asterisk * is
for
multiplication

(Refer Slide Time: 02:25)

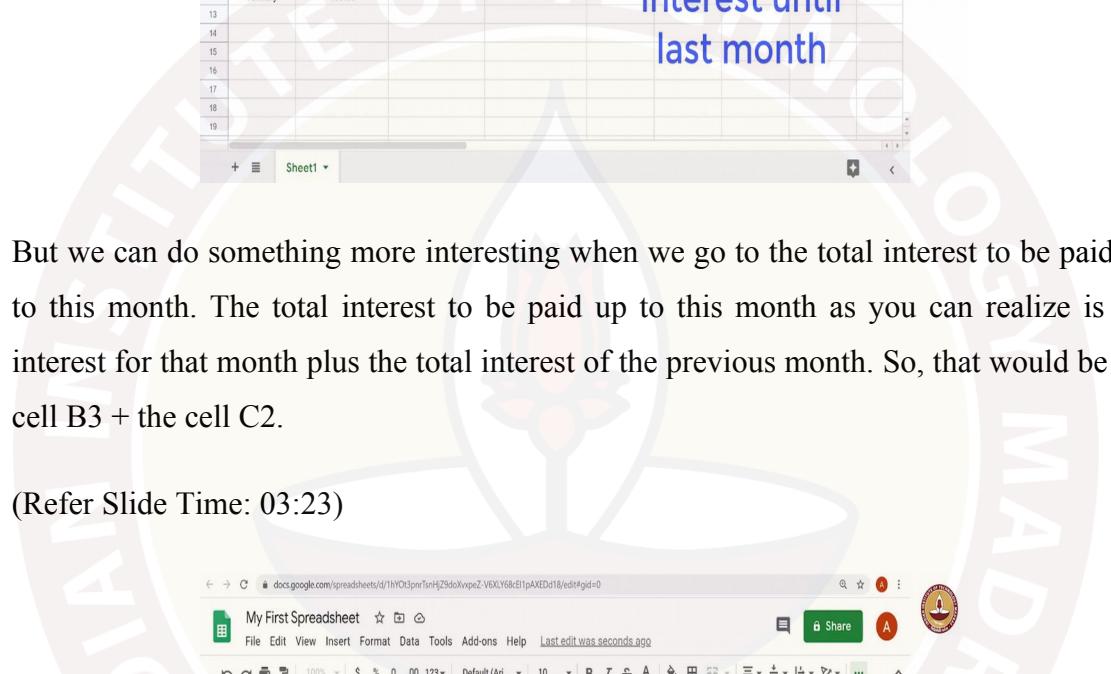
Month	Interest to be paid for the month	Total Interest to be paid upto this month	Total Money owed upto this month
March	₹0.00	₹0.00	₹10,000.00
April	=10000*0.5/100		
May			
June			
July			
August			
September			
October			
November			
December			
January			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			

Shift + 8

Also pay attention to the multiplication symbol being the asterisk. The asterisk is the symbol above the 8 key. You can press shift and 8 and you will get the asterisk symbol; I am going to delete the extra one here. So, now we have done this, enter and we have 50.

As before, we are going to use auto fill to fill these cells and now they are all 50 rupees as we know the interest for each month is a fixed amount and that is 50 rupees.

(Refer Slide Time: 03:04)



A screenshot of a Google Sheets spreadsheet titled "My First Spreadsheet". The spreadsheet has a single sheet named "Sheet1". The data starts with a header row:

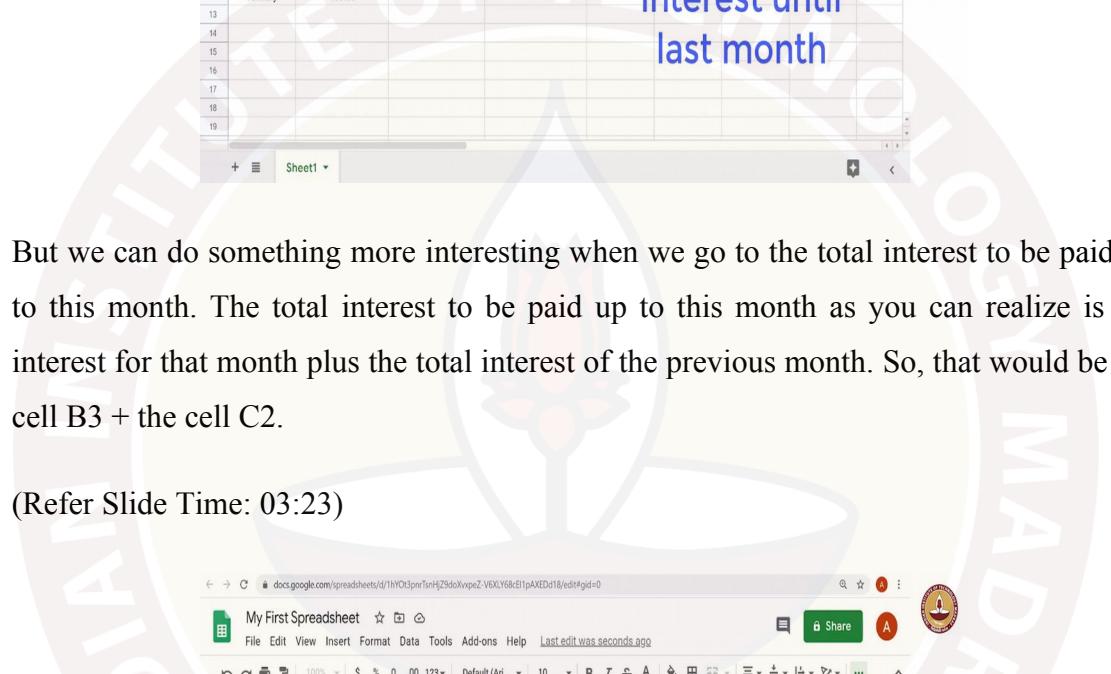
Month	Interest to be paid for the month	Total Interest to be paid upto this month	Total Money owed upto this month
March	₹0.00	₹0.00	₹10,000.00
April	₹50.00	₹50.00	
May	₹50.00	₹100.00	
June	₹50.00	₹150.00	
July	₹50.00	₹200.00	
August	₹50.00	₹250.00	
September	₹50.00	₹300.00	
October	₹50.00	₹350.00	
November	₹50.00	₹400.00	
December	₹50.00	₹450.00	
January	₹50.00	₹500.00	

To the right of the table, there is handwritten text in blue ink:

Total interest
= interest this month + total interest until last month

But we can do something more interesting when we go to the total interest to be paid up to this month. The total interest to be paid up to this month as you can realize is the interest for that month plus the total interest of the previous month. So, that would be the cell B3 + the cell C2.

(Refer Slide Time: 03:23)



A screenshot of a Google Sheets spreadsheet titled "My First Spreadsheet". The spreadsheet has a single sheet named "Sheet1". The data starts with a header row:

Month	Interest to be paid for the month	Total Interest to be paid upto this month	Total Money owed upto this month
March	₹0.00	₹0.00	₹10,000.00
April	₹50.00	₹50.00	
May	₹50.00	₹100.00	
June	₹50.00	₹150.00	
July	₹50.00	₹200.00	
August	₹50.00	₹250.00	
September	₹50.00	₹300.00	
October	₹50.00	₹350.00	
November	₹50.00	₹400.00	
December	₹50.00	₹450.00	
January	₹50.00	₹500.00	

To the right of the table, there is handwritten text in green ink:

Cell Reference

(Refer Slide Time: 03:36)

My First Spreadsheet

File Edit View Insert Format Data Tools Add-ons Help Last edit was seconds ago

fx =B3+C

	A	B	C	D	E	F	G	H	I
1	Month	Interest to be paid for the month	Total Interest to be paid upto this month	Total Money owed upto this month					
2	March	₹0.00	₹0.00	₹10,000.00					
3	April	₹50.00							
4	May	₹50.00	COS						
5	June	₹50.00	Cosine of an angle provided in radians.						
6	July	₹50.00	COT						
7	August	₹50.00	CSC						
8	September	₹50.00	CELL						
9	October	₹50.00	CHAR						
10	November	₹50.00	CODE						
11	December	₹50.00	COSH						
12	January	₹50.00	COTH						
13			CSSH						
14			CLEAN						
15									
16									
17									
18									
19									

= B3 + C2

Sheet 1

And this we can do by using again the “is equal to” symbol and we directly refer to the cell B3 as you can see the highlighted cell is B3, when I type in B3, the spreadsheet software highlights it plus C2 and that is also highlighted. And now I will press enter and I get the 50 rupees which is 50 plus 0.

(Refer Slide Time: 04:10)

Similarly, the total money owed up to this month would be the principal plus the total interest to be paid up to this month. So, I could again use cell reference and I could write this cell D3 to be equal to D2 + C3 and I get this.

Now, let us see what auto fill does here. I take this 50 and I drag it down like this and we see that the increments are all correct. 100 is this 50 plus this 50 and 150 is this 50 plus this 100 likewise, 200 is this 50 plus this 150. All these values have been filled in correctly. And how is that happening? Let us observe the formulae. This cell we wrote it as $B3 + C2$, but now when we go down to the next cell, it has changed to $B4 + C3$ and this one it has changed to $B5 + C4$.

(Refer Slide Time: 05:08)

Month	Interest to be paid for the month	Total Interest to be paid upto this month	Total Money owed upto this month
March	₹0.00	₹0.00	₹10,000.00
April	₹50.00	₹50.00	₹10,050.00
May	₹50.00	₹100.00	
June	₹50.00	₹200.00	
July	₹50.00	₹250.00	
August	₹50.00	₹300.00	
September	₹50.00	₹350.00	
October	₹50.00	₹400.00	
November	₹50.00	₹450.00	
December	₹50.00	₹500.00	
January	₹50.00		

So, what auto fill is doing is it is correspondingly changing the cells in the formula as we have gone down vertically as we have drag down vertically, it is only changing the row numbers, it is not changing the column values B is B, C is C; but as you can see $B6 + C5$, now it becomes $B7 + C6$. Now its becomes $B8 + C7$ and so on. So, this is giving us the values we want.

However, if we looked at the D column and we try to do the same thing, let us hold this and now drag it down. We see that there is a problem here. What I want is actually the principal plus the interest up to that point which should say this cell should be 10,150 whereas, this is 10,300.

This cell should be $10,000 + 200$, but it is now 10,500. So, what is going wrong is my formula is being updated to $D3 + C4$; the next one becomes $D4 + C5$. The next one becomes $D5 + C6$. But what we really want is the D2 to be fixed, the formula should not change D2; it should only change the C column row number.

(Refer Slide Time: 06:38)

Month	Interest to be paid for the month	Total Interest to be paid upto this month	Total Money owed upto this month
2 March	₹0.00	₹0.00	₹10,000.00
3 April	₹50.00	₹50.00	=D\$2+C3
4 May	₹50.00	₹100.00	₹10,150.00
5 June	₹50.00	₹150.00	₹10,300.00
6 July	₹50.00	₹200.00	₹10,500.00
7 August	₹50.00	₹250.00	₹10,750.00
8 September	₹50.00	₹300.00	₹11,050.00
9 October	₹50.00	₹350.00	₹11,400.00
10 November	₹50.00	₹400.00	₹11,800.00
11 December	₹50.00	₹450.00	₹12,250.00
12 January	₹50.00	₹500.00	₹12,750.00
13			
14			
15			
16			
17			
18			
19			

And this can be done by putting a dollar symbol in the formula in front of the 2 and press enter. This cell does not change, but what the dollar symbol does when we do an auto fill now is, it keeps the cell fixed. And now, if you look at the formulae for the cells here, this is $D2 + C4$ now, this is $D2 + C5$, this is $D2 + C6$. In all cases we are getting the principal plus the corresponding interest up to that month.

Now, let us do something similar with this column. All of these instead of using the number 10,000; let us use cell reference. So, I will make this is equal to $D\$2$ once again because I only want the 10,000 amount and not the corresponding cells below. This value into again the same 0.5 by 100 enter and now again use what auto fill to bring this down and we see that, every cell is currently $D2 * 0.5 / 100$.

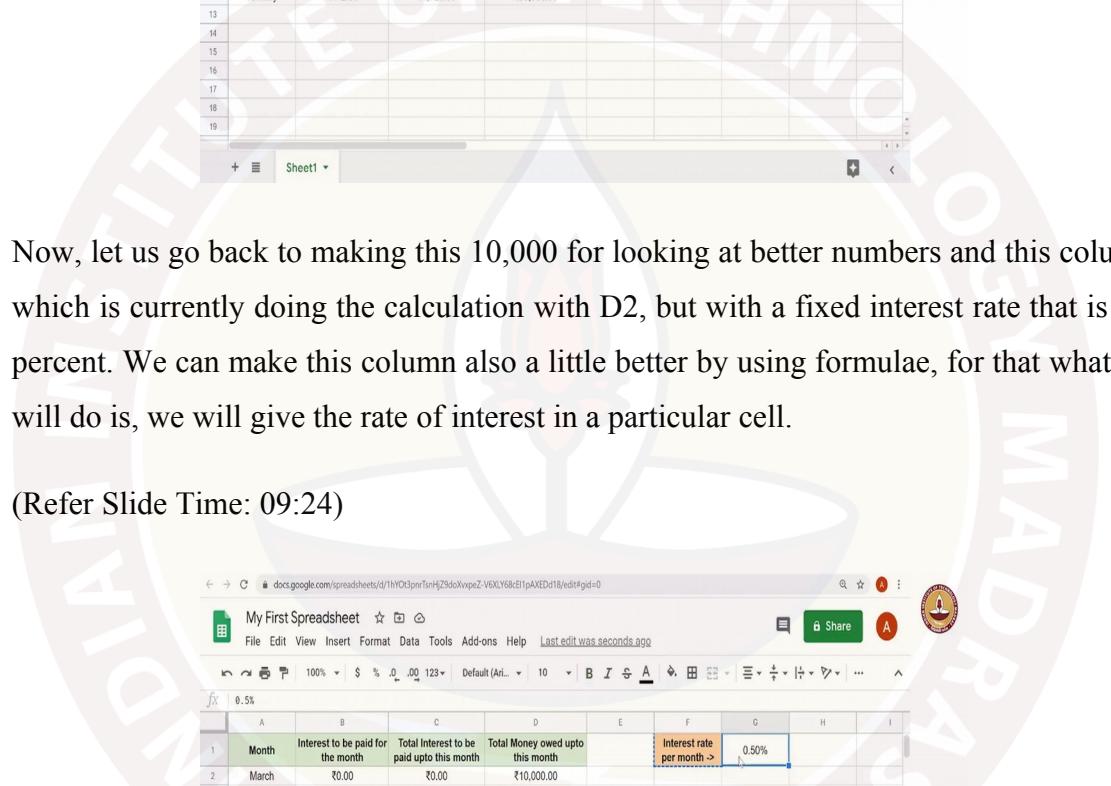
(Refer Slide Time: 08:11)

Month	Interest to be paid for the month	Total Interest to be paid upto this month	Total Money owed upto this month
March	₹0.00	₹0.00	₹20,000.00
April	₹100.00	₹100.00	₹20,100.00
May	₹100.00	₹200.00	₹20,200.00
June	₹100.00	₹300.00	₹20,300.00
July	₹100.00	₹400.00	₹20,400.00
August	₹100.00	₹500.00	₹20,500.00
September	₹100.00	₹600.00	₹20,600.00
October	₹100.00	₹700.00	₹20,700.00
November	₹100.00	₹800.00	₹20,800.00
December	₹100.00	₹900.00	₹20,900.00
January	₹100.00	₹1,000.00	₹21,000.00
13			
14			
15			
16			
17			
18			
19			

And the reason this is useful, the reason cells reference is very useful is this. If I change my principal amount instead of 10,000 suppose I had made it 20,000; all the corresponding cells are automatically updated and this is because we are using cell reference. Every cell here depends on the 20,000, every cell here depends on the 20,000 and this one depends on the B column which is dependent on the 20,000 cell.

So, just this one change can give us an automatic update of all the month's information. So, you could give some strange number I mean an uncomfortable number like say 34,578 rupees and all the calculations are done for you.

(Refer Slide Time: 08:46)

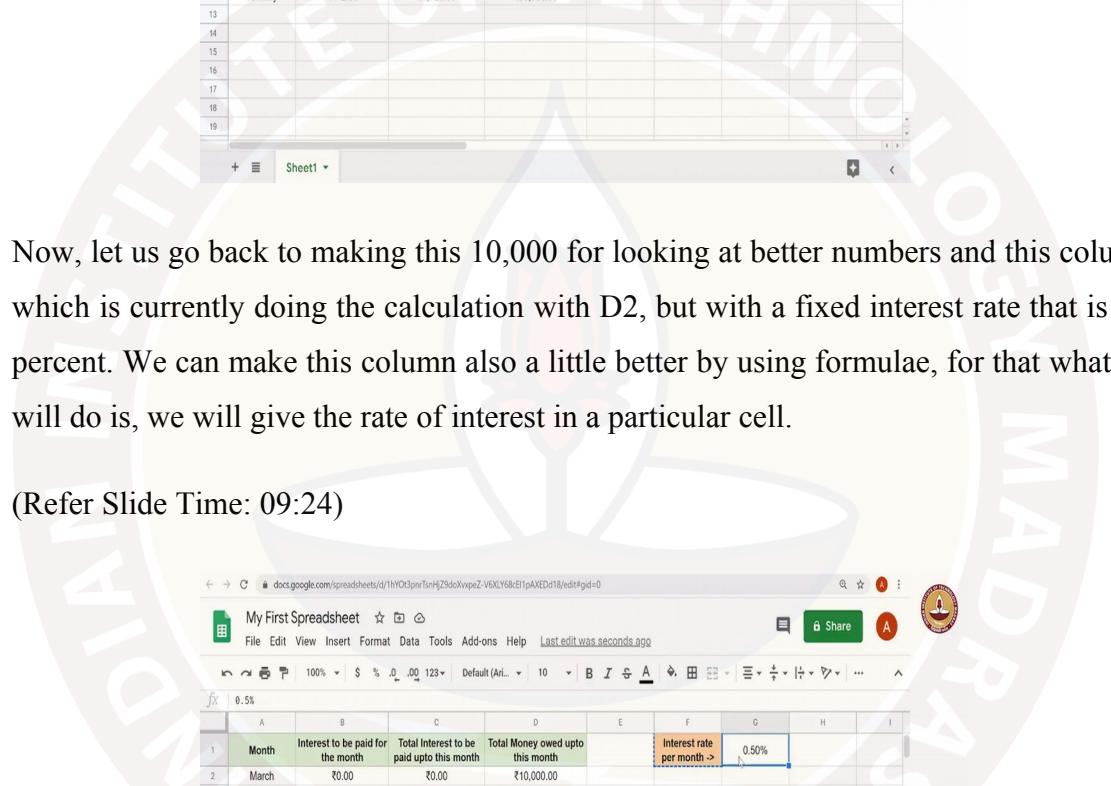


A screenshot of a Google Sheets spreadsheet titled "My First Spreadsheet". The spreadsheet contains a table with 12 rows of data, each representing a month from March to January of the next year. The columns are labeled A through I. Column A is "Month", column B is "Interest to be paid for the month", column C is "Total Interest to be paid upto this month", and column D is "Total Money owed upto this month". The value in cell D3 is highlighted with a blue selection.

Month	Interest to be paid for the month	Total Interest to be paid upto this month	Total Money owed upto this month					
March	₹0.00	₹0.00	₹34,576.00					
April	₹172.89	₹172.89	₹34,750.89					
May	₹172.89	₹345.78	₹34,923.78					
June	₹172.89	₹518.67	₹35,096.67					
July	₹172.89	₹691.56	₹35,269.56					
August	₹172.89	₹864.45	₹35,442.45					
September	₹172.89	₹1,037.34	₹35,615.34					
October	₹172.89	₹1,210.23	₹35,788.23					
November	₹172.89	₹1,383.12	₹35,961.12					
December	₹172.89	₹1,556.01	₹36,134.01					
January	₹172.89	₹1,728.90	₹36,306.90					

Now, let us go back to making this 10,000 for looking at better numbers and this column which is currently doing the calculation with D2, but with a fixed interest rate that is 0.5 percent. We can make this column also a little better by using formulae, for that what we will do is, we will give the rate of interest in a particular cell.

(Refer Slide Time: 09:24)



A screenshot of a Google Sheets spreadsheet titled "My First Spreadsheet". The spreadsheet contains a table with 12 rows of data, each representing a month from March to January of the next year. The columns are labeled A through I. Column A is "Month", column B is "Interest to be paid for the month", column C is "Total Interest to be paid upto this month", and column D is "Total Money owed upto this month". Column F is "Interest rate per month" and contains the value "0.5%". The cell F6 is highlighted with a red selection. In the bottom left corner of the spreadsheet area, there is a green "Copy" button and a grey "Ctrl + C" button.

Month	Interest to be paid for the month	Total Interest to be paid upto this month	Total Money owed upto this month		Interest rate per month >			
March	₹0.00	₹0.00	₹10,000.00		0.5%			
April	₹50.00	₹50.00	₹10,050.00					
May	₹50.00	₹100.00	₹10,100.00					
June	₹50.00	₹150.00	₹10,150.00					
July	₹50.00	₹200.00	₹10,200.00					
August	₹50.00	₹250.00	₹10,250.00					
September	₹50.00	₹300.00	₹10,300.00					
October	₹50.00	₹350.00	₹10,350.00					
November	₹50.00	₹400.00	₹10,400.00					
December	₹50.00	₹450.00	₹10,450.00					
January	₹50.00	₹500.00	₹10,500.00					

In this cell, I will write down the title which is interest rate per month, enter and I would like to format it. Once again I will do text wrapping and now I will center align it a bit horizontal align, vertical align and maybe also give it a nice color, let us use this and

bold. So, this to indicate that it is the next cell, I will also give a small arrow looking symbol and the interest rate I am going to fill it in the cell which is our 0.5 percent and once again center align and done.

Now, what we could do is since we know that G2 in fact, I could just use the same formatting for this cell so, a very nice way to do that is I can use this cell, copy which is control C and then go here and paste control V and now change the content. So, I have managed to paste the format change the content to 0.5% and if we go back to our column here, the B column; we are going to refer to the cell G1 in order to calculate this value.

(Refer Slide Time: 11:07)

	D	E	F	G	H	I
1	Total Money owed upto this month		Interest rate per month ->	0.50%		
2	₹10,000.00					
3	₹10,050.00					
4	₹10,100.00					
5	₹10,150.00					
6	₹10,200.00					
7	₹10,250.00					
8	₹10,300.00					
9	₹10,350.00					
10	₹10,400.00					
11	December ₹50.00	₹450.00	₹10,450.00			
12	January ₹50.00	₹500.00	₹10,500.00			
13						
14						
15						
16						
17						
18						
19						

So, instead of $D2 * 0.5/100$, I am just going to write it as $D2 * G$1$. In fact, if I want to specifically mention just that cell, I could also put a dollar in front of the column title which is G. So, I have D2 into dollar G dollar 1 enter. And now if I did the auto fill here, every cell is the same quantity which is the principal into the rate of interest.

(Refer Slide Time: 11:49)

The screenshot shows a Google Sheets spreadsheet titled "My First Spreadsheet". The data is as follows:

	A	C	D	E	F	G	H	I
1	Mar	Interest to be ptd this month	Total Money owed upto this month		Interest rate per month ->	0.5%		
2	Mar	₹0.00	₹10,000.00		Principal ->	₹10,000.00		
3	Apr	₹50.00	₹10,050.00					
4	May	₹100.00	₹10,100.00					
5	Jun							
6	Jul							
7	Aug							
8	Sept							
9	Oct							
10	Nov							
11	Dec							
12	Janu							
13								
14								
15								
16								
17								
18								
19								

A context menu is open over the cell containing "₹10,000.00" in column F. The menu is titled "Paste special" and includes the following options:

- Paste values only
- Paste format only
- Paste all except borders
- Paste column widths only
- Paste formula only
- Paste data validation only
- Paste conditional formatting only
- Paste transposed

Text overlay on the right side of the menu reads: "Paste Special allows pasting particular properties of the cell".

I could go further and I can do the same thing with the principal. So, I am going to also enter the principal here and this principle, we are currently calling it 10,000 rupees, I could copy paste again, control C and control V.

And now if I wanted the same formatting as this, control C, I select these two cells and there is something called paste special which is we can go into the edit and in paste, control V was paste; but control alt V which is a special kind of paste, it paste only the format without the cell value. So, I just do this and now I have them all in the same format. Of course, this one can again be made number - Indian rupee.

(Refer Slide Time: 12:46)

Now, the convenience of all of this is, if I correspondingly changed all the mentions of a principal to that particular cell which is equal to \$G\$2. And this one also instead of D2, I will just refer to the cell with the principle which is \$G\$2. And thus, bring it all down and here also, I do not want it to refer to D2 any longer, I just want to G2 and again drag it all the way down.

(Refer Slide Time: 13:53)

Month	Interest to be paid for the month	Total Interest to be paid upto this month	Total Money owed upto this month	Interest rate per month >	Principal >
March	₹0.00	₹0.00	₹15,000.00		₹15,000.00
April	₹45.00	₹45.00	₹15,045.00		
May	₹45.00	₹90.00	₹15,090.00		
June	₹45.00	₹135.00	₹15,135.00		
July	₹45.00	₹180.00	₹15,180.00		
August	₹45.00	₹225.00	₹15,225.00		
September	₹45.00	₹270.00	₹15,270.00		
October	₹45.00	₹315.00	₹15,315.00		
November	₹45.00	₹360.00	₹15,360.00		
December	₹45.00	₹405.00	₹15,405.00		
January	₹45.00	₹450.00	₹15,450.00		

Now, the convenience that we have with this kind of a setup is, you could automatically update the whole sheet simply by playing with these numbers. You want to change this

number to 15,000; you get the corresponding values and you want to change the interest rate, you want to make it 1% instead of 0.5; you getting the corresponding values, you could change it to 0.3% and the calculation is done.

So, this way you do not really need to input every cell of your spreadsheet. If you organize your spreadsheet well and you make sure it represents the data properly, you can also play around with your spreadsheet and update it in very easy ways. And in our example, the entire simple interest data for so and so number of months is completely dependent on these two cells G1 and G2. So, in this way organizing your data and building your spreadsheet in a way you can manipulate all your data conveniently is a very useful skill to have.

In the next video, we will see about some functions that you can use in your spreadsheets.

Thank you.