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1. SUM of Digits when cell Contains all Numbers

If you cell contains only numbers like A1:= 7654045, then following formula can be used to find sum of digits

=SUM(--MID(A1,SEQUENCE(LEN(A1)),1))

=SUMPRODUCT(--MID(A1,ROW(INDIRECT("1:"&LEN(A1))),1))

=SUM(--MID(A1,ROW(INDIRECT("1:"&LEN(A1))),1))

If A1 is blank, then to handle error, you can enclose above formulas into an IFERROR block.

2. SUM of Digits when cell Contains Numbers and non Numbers both

If your cell contains non numbers apart from numbers like A1:= 76$5a4b045%d, then following formulas can be used to find sum of digits

=SUM(IFERROR(--MID(A1,SEQUENCE(LEN(A1)),1),0))

=SUMPRODUCT((LEN(A1)-LEN(SUBSTITUTE(A1,ROW($1:$9),"")))*ROW($1:$9))

=SUM(IFERROR(--MID(A1,ROW(INDIRECT("1:"&LEN(A1))),1),0))

3. A List is Unique or Not (Whether it has duplicates)

Assuming, your list is in A1 to A1000. Use following formula to know if list is unique.

=MAX(COUNTIF(A1:A1000,A1:A1000))

If answer is 1, then it is Unique. If answer is more than 1, it is not unique.

4. Count No. of Unique Values

Use following formula to count no. of unique values -

=IF(COUNTA(A1:A100)=0,0,COUNTA(UNIQUE(FILTER(A1:A100&"",A1:A100<>""))))

=SUMPRODUCT((A1:A100<>"")/COUNTIF(A1:A100,A1:A100&""))

=SUM((A1:A100<>"")/COUNTIF(A1:A100,A1:A100&""))

5. Count No. of Unique Values Conditionally

If you have data like below and you want to find the unique count for Region = “A", then you can use below formula –

Let's say that A1 contains the year. To know whether it is a Leap Year or not, use following formula -

=MONTH(DATE(A1,2,29))=2

=DAY(EOMONTH(DATE(A1,2,1),0))=29

TRUE means that it is Leap Year and FALSE means that this is not a Leap Year.

31. Last Working Day of the Month If a Date is Given

If A1 holds a date, the formula for calculating last Working Day of the month would be

=WORKDAY(EOMONTH(A1,0)+1,-1)

The above formula assumes that your weekends are Saturday and Sunday.

But, if your weekends are different (e.g. in gulf countries), you can use following formula -

=WORKDAY.INTL(EOMONTH(A1,0)+1,-1,"0000110")

Where 0000110 is a 7 character string, 1 represents a weekend and 0 is a working day. First digit is Monday and last digit is Sunday. The above example is for Gulf countries where Friday and Saturday are weekends.

You also have an option to give a range which has holidays. In that case, your formula would become

=WORKDAY(EOMONTH(A1,0)+1,-1,D1:D10)

=WORKDAY.INTL(EOMONTH(A1,0)+1,-1,"0000110",D1:D10)

Where range D1:D10 contains the list of holidays.

32. First Working Day of the Month if a Date is Given

If A1 contains a date, then formula for First Working Day of the month would be

=WORKDAY(EOMONTH(A1,-1),1)

The above formula assumes that your weekends are Saturday and Sunday.

But, if your weekends are different (e.g. in gulf countries), you can use following formula -

=WORKDAY.INTL(EOMONTH(A1,-1),1,"0000110")

Where 0000110 is a 7 character string, 1 represents a weekend and 0 is a working day. First digit is Monday and last digit is Sunday. The above example is for Gulf countries where Friday and Saturday are weekends.

If name is of 2 or 1 words, the result will be blank. This works on 3 words name only as middle can be decided only for 3 words name.

82. Extract Middle Name from Full Name

=IF(COUNTIF(A1,"* * *"),MID(A1,FIND(" ",A1)+1,FIND(" ",A1,FIND(" ",A1)+1)-(FIND(" ",A1)+1)),"")

=IF(COUNTIF(A1,"* * *"),TRIM(MID(SUBSTITUTE(A1," ",REPT(" ",LEN(A1)),2),FIND(" ",A1)+1,LEN(A1))),"")

=IF(COUNTIF(A1,"* * *"),LEFT(REPLACE(A1,1,FIND(" ",A1),""),FIND(" ",REPLACE(A1,1,FIND(" ",A1),""))-1))

83. Remove Middle Name in Full Name

=IF(COUNTIF(A1,"* * *"),LEFT(A1,FIND(" ",A1&" "))&TRIM(RIGHT(SUBSTITUTE(A1," ",REPT(" ",LEN(A1))),LEN(A1))),"")

=IF(COUNTIF(A1,"* * *"),REPLACE(A1,FIND(" ",A1)+1,FIND(" ",A1,FIND(" ",A1)+1)-FIND(" ",A1),""),"")

84. Extract Integer and Decimal Portion of a Number

To extract Integer portion, one of the below can be used -

=INT(A1)

=TRUNC(A1)

Positive value in A1 - If A1 contains 84.65, then answer would be 84 in both cases

Negative value in A1 - If A1 contains -84.65, then answer would be -85 in case of INT and -84 in case of TRUNC.

If you want only +ve value whether value in A1 is -ve or +ve, the formula can have many variants. Notice answers for negative values in case INT.

	84.65	-84.65
INT(ABS(A1))	84	84
TRUNC(ABS(A1))	84	84
ABS(INT(A1))	84	85
ABS(TRUNC(A1))	84	84

To extract Decimal portion -

=MOD(ABS(A1),1)

=ABS(A1)-INT(ABS(A1))

Positive value in A1 - If A1 contains 84.65, then answer would be 0.65.
Negative value in A1 - If A1 contains -24.39, then answer would be 0.39.

85. Maximum Times a Particular Entry Appears Consecutively

	A	B
1	**Region**	**Sales Man**
2	A	a
3	A	a
4	g	b
5	g	b
6	g	b
7	g	c
8	A	c
9	A	a
10	B	m
11	B	n
12	A	o
13	A	p
14	A	d
15	B	d
16	B	e
17	B	e

Suppose, we want to count maximum times "A" appears consecutively,

=MAX(FREQUENCY(IF(A2:A20="A",ROW(A2:A20)),
IF(A2:A20<>"A",ROW(A2:A20))))

86. Get File Name through Formula

Before getting this, make sure that you file has been saved at least once as this formula is dependent upon the file path name which can be pulled out by CELL function only if file has been saved at least once.

=CELL("filename",$A$1)

87. Get Workbook Name through Formula

Before getting this, make sure that you file has been saved at least once as this formula is dependent upon the file path name which can be pulled out by CELL function only if file has been saved at least once.

=REPLACE(LEFT(CELL("filename",$A$1),FIND("]",CELL("filename",$A$1))-1),1,FIND("[",CELL("filename",$A$1)),"")

88. Get Sheet Name through Formula

Before getting this, make sure that you file has been saved at least once as this formula is dependent upon the file path name which can be pulled out by CELL function only if file has been saved at least once.

Use following formula -

Concatenation Approach

=XLOOKUP(F2&"@@@"&G2,A2:A12&"@@@"&B2:B12,C2:C12,"")

=INDEX(C2:C12,MATCH(F2&"@@@"&G2,A2:A12&"@@@"&B2:B12,0))

@@@ can be replaced by any characters which should not be part of those columns.

By concatenation, you can have as many columns as possible.

CAUTION - Result of entire concatenation should not be having length more than 255. Hence, F2&"@@@"&G2 should not have more than 255 characters.

Another alternative is to use below formula -

=INDEX(C2:C12,MATCH(1,--NOT(ISLOGICAL(IF(A2:A12=F2,IF(B2:B12=G2,C2:C12)))),0))

Note – To handle Not Found condition, you can enclose all above formulas in an IFERROR block.

91. VLOOKUP from Right to Left

(Made redundant by XLOOKUP but useful for older version)

VLOOKUP always looks up from Left to Right. Hence, in the below table, I can find Date of Birth of Naomi by giving following formula –

=VLOOKUP("Naomi",B:D,3,0)

	A	B	C	D	E	F	G	H	I
1	Emp ID	First Name	Gende	Date of Birth	Date of Joini	Salary	State	Zip	Region
2	250945	Terisa	F	5/23/1984	12/11/2009	64667	VA	22651	South
3	778777	Milton	M	10/10/1986	1/6/2014	46688	TX	78344	South
4	962153	Lonnie	F	1/13/1972	7/23/2009	78661	MN	56088	Midwest
5	833630	Naomi	F	11/25/1961	2/27/1990	118632	AR	71855	South
6	565499	Cathryn	F	8/13/1979	11/30/2009	181053	WA	99349	West
7	608769	Sylvester	M	5/24/1969	6/28/1999	76790	LA	71418	South
8	262325	Jamaal	M	3/16/1968	8/30/1999	170583	IN	46866	Midwest
9	562671	Leslie	F	8/8/1975	7/14/2007	136188	MN	56178	Midwest
10	711925	Gaynell	F	7/30/1990	1/20/2013	88425	MD	20724	South
11	613284	Loria	F	7/29/1992	5/20/2015	194557	OH	44282	Midwest
12	917399	Florance	F	3/31/1965	7/18/1986	177637	CA	94307	West
13	369366	Mathew	M	6/11/1993	8/16/2015	193972	MS	39113	South
14	642751	Scottie	M	12/24/1966	9/3/2015	198240	MO	63876	Midwest
15	323627	Timmy	M	5/19/1993	9/21/2014	175621	NM	87413	West
16	833463	Warren	M	5/13/1981	8/30/2011	142919	CA	95667	West
17	146564	Delta	F	6/19/1984	10/10/2011	132695	WV	25685	South
18	290540	Hal	M	12/5/1980	3/21/2009	118357	IA	51201	Midwest
19	219886	Alberto	M	3/16/1958	3/6/1992	126401	VA	23054	South

=SUMPRODUCT((A1:A100)*(MOD(ROW(A1:A100)-ROW(A1)+1,2)<>0))

This is a generic formula, hence if your range is B7:B50, your formula will become

=SUM((B7:B50)*(MOD(ROW(B7:B50)-ROW(B7)+1,2)<>0))

=SUMPRODUCT((B7:B50)*(MOD(ROW(B7:B50)-ROW(B7)+1,2)<>0))

103. Sum Top N values in a Range

Suppose you have numbers in range A1:A100 and you want to sum up top N values

=SUM(LARGE($A$1:$A$100,ROW(1:10)))

=SUMPRODUCT(LARGE($A$1:$A$100,ROW(1:10)))

=SUM(AGGREGATE(14,6,$A$1:$A$100,ROW(1:10)))

=SUMPRODUCT(AGGREGATE(14,6,$A$1:$A$100,ROW(1:10)))

In case, you want to ignore 0 values (and blanks)

=SUM(LARGE(IF($A$1:$A$100<>0,$A$1:$A$100),ROW(1:10)))

=SUMPRODUCT(LARGE(IF($A$1:$A$100<>0,$A$1:$A$100),ROW(1:10)))

Both the above formulas will function only if there are at least N values as per ROW(1:N). Hence, for above formulas, it would work only if there are at least 10 numbers in A1 to A100. To overcome this limitation –

=SUM(IFERROR(LARGE($A$1:$A$100,ROW(1:10)),0))

=SUM(IFERROR(LARGE(IF($A$1:$A$100<>0,$A$1:$A$100),ROW(1:10)),0))

=SUM(AGGREGATE(14,6,$A$1:$A$100/($A$1:$A$100<>0),ROW(1:10)))

=SUMPRODUCT(AGGREGATE(14,6,$A$1:$A$100/($A$1:$A$100<>0),ROW(1:10)))

104. We have AVERAGEIF. What about MEDIANIF and MODEIF?

Excel doesn't provide MEDIANIF and MODEIF. You will have to use Array formulas to achieve these functionality. Let's assume that our data is like below –

	A	B	C	D	E	F	G	H	I
1	Interest Rate	12%						Period	Interest
2	Period for which Interest is wanted	24						1	$100.00
3	No. of Payments	36						2	$97.68
4	Loan Amount	10000		0 - At the end of the Period 1 - At the beginning of the period				3	$95.33
5	Future Value	0						4	$92.97
6	EMI Due Type	0						5	$90.57
7								6	$88.16
8	Interest	$40.30						7	$85.72
9								8	$83.25
10								9	$80.77
11								10	$78.25
12								11	$75.71
13								12	$73.15
14								13	$70.56
15								14	$67.94
16								15	$65.30
17								16	$62.63
18								17	$59.94
19								18	$57.21
20								19	$54.47
21								20	$51.69

131. Financial Function - Calculate Principal Part of an EMI

Now the EMI for a month = Interest for that month and Principal for that month. IPMT is used to calculate the interest portion of your EMI. To calculate the principal part of an EMI, you will need to use PPMT.

Excel defines PPMT as "Returns the payment on the principal for a given period for an investment based on periodic, constant payments and a constant interest rate."

The syntax of PPMT is PPMT(rate, per, nper, pv, [fv], [type])

rate: Your rate of interest

per: Period for which you want to calculate Principal

nper: No. of payments. Your nper and rate should be on the same scale. i.e if you are planning to pay up monthly, the rate in your formula should be monthly only. Generally, interest rate is specified yearly i.e. 10.5% per year. This you should divide by 12 to arrive at monthly rate. Hence, if you wanted 3 years loan, it means nper would 3x12=36 months. If it is quarterly, rate = 10.5%/4 = 2.625% and nper would be 3x4 = 12
If it is annual, rate = 10.5% and nper = 3

pv: Your loan amount. You will need to put negative value of this in your formula. If you don't put negative value, your EMI would be in negative but answer would be same though with negative sign.

+ve / -ve PPMT requires some explanation though you may choose to ignore. It depends upon your cashflow. If you are taking a loan, hence cash in, hence pv is +ve. But every month, you will have to pay up something, hence cash out. Hence, PPMT is -ve. If you are investing, hence cash out. Hence pv is -ve. But every month, you will be receiving something, hence cash in. Hence, PPMT is +ve.

Now what is +ve or -ve is simply your preference. I recommend you should not worry about this.

fv: Your remaining value after you finish your installment. Generally, it is 0 as any lender will like to recover its money fill. (Default is 0)

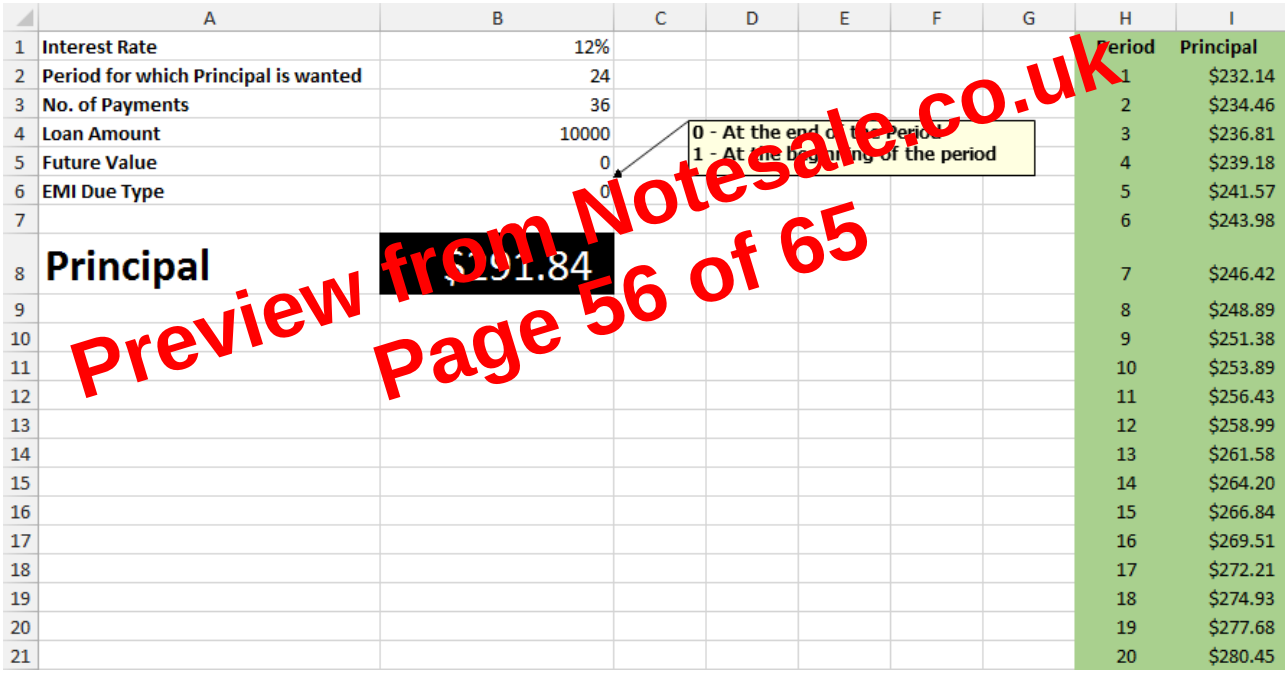
type: 0 - At the end of the period, 1 - At the beginning of the period (Default is 0)

Also note, fv and type are optional and may not be required in your formula.

The formula used in the below picture is =PPMT(B1/12,B2,B3,-B4,B5,B6)

Also, since Principal will vary every month, hence it makes sense to calculate it for each month. Columns H & I carry Principal for each month.

Bonus Tip = If you use ABS function, then there would be no need to put negative value of PV. Hence, formula in this case would be =ABS(PPMT(B1/12,B2,B3,B4,B5,B6))



	A	B	C	D	E	F	G	H	I
1	Interest Rate	12%						Period	Principal
2	Period for which Principal is wanted	24						1	$232.14
3	No. of Payments	36						2	$234.46
4	Loan Amount	10000						3	$236.81
5	Future Value	0						4	$239.18
6	EMI Due Type	0						5	$241.57
7								6	$243.98
8	Principal	$291.84						7	$246.42
9								8	$248.89
10								9	$251.38
11								10	$253.89
12								11	$256.43
13								12	$258.99
14								13	$261.58
15								14	$264.20
16								15	$266.84
17								16	$269.51
18								17	$272.21
19								18	$274.93
20								19	$277.68
21								20	$280.45

132. Financial Function - Calculate Number of EMIs to Pay Up a Loan

You have taken a loan and you know your EMI capability. So, you want to know how many months will be taken to pay off a loan completely.

It is fairly easy job to do it in Excel. You will need to use NPER function for this.

Excel defines NPER as "Returns the number of periods for an investment based on periodic, constant payments and a constant interest rate."

134. Financial Function – Calculate Compounded Interest

As part of our Mathematics courses in our childhood, we had learned about Compounded Interest. The famous formula which we remember is
Compounded Balance = Principal x (1+rate)^N

This is a fairly easy job to do in Excel. The formula to be used is FV.

Excel help describes FV as "Returns the future value of an investment based on periodic, constant payments and a constant interest rate".

The syntax of FV is FV(rate,nper,pmt,[pv],[type])

You require only 3 pieces of information for Compounded Balance.

rate: Interest rate on which compounding needs to be done

nper: Total number of periods for which compounding needs to be done. Now rate and nper should be on the same scale. If interest rate is monthly, then nper should be in months. If interest rate is quarterly, then nper should be in quarter. If interest rate is annual, then nper should be in years.

pv: This is the initial principal and it has to be specified in -ve. (Note, I have already discussed significance of +ve and -ve in many previous tips on Financial Functions.)

The formula used in below picture for Monthly

=FV(B1/12,B3*12,0,-B2)

The formula used in below picture for Quarterly

=FV(F1/4,F3*4,0,-F2)

The formula used in below picture for Yearly

=FV(J1,J3,0,-J2)