

APPLIED SOFTWARE AUTOMATION TOOLS

RIGA TECHNICAL UNIVERSITY

COURSE I

17.09.2020

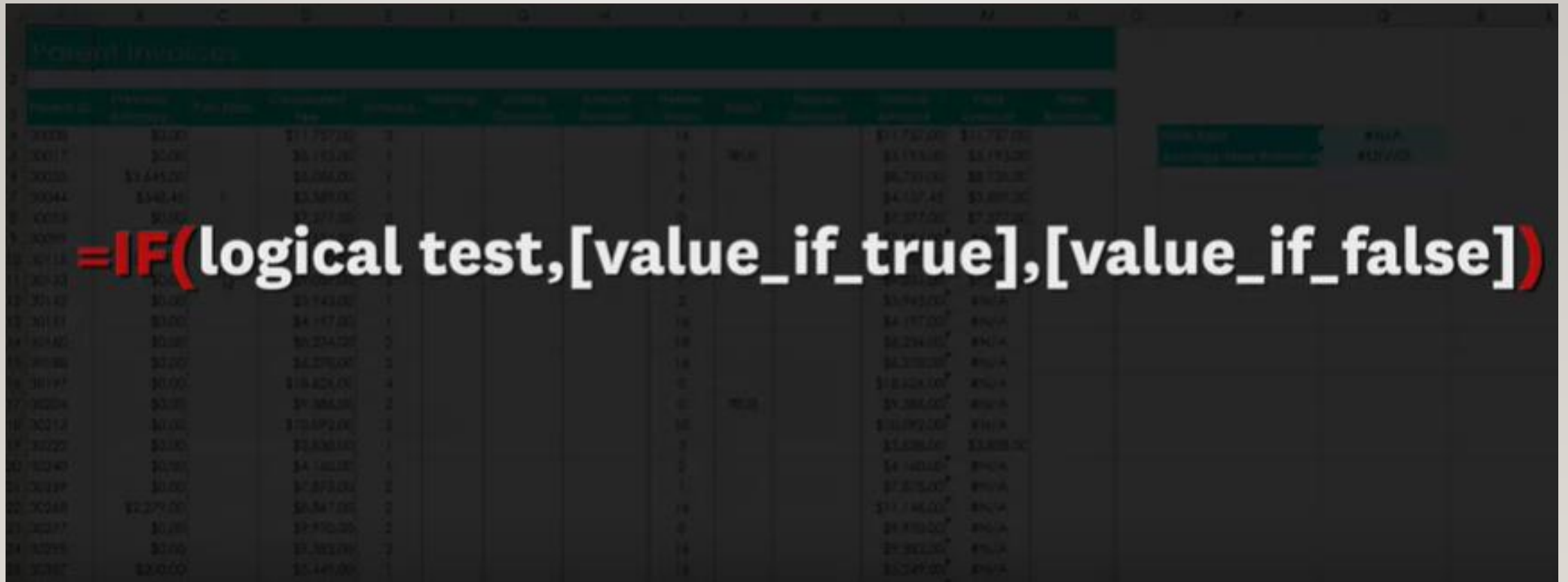


STRUCTURE

Logical Functions:

1. IF
2. AND & OR
3. IF with AND and with OR
4. Nested Ifs
5. IFERROR and IFNA

I. LOGICAL FUNCTIONS: IF



The image shows an Excel spreadsheet with a table of data. The table has columns for 'Product ID', 'Category', 'Price', 'Quantity', 'Total Price', 'Status', 'Date', 'Location', 'Sales', and 'Profit'. The data is organized into rows, with some cells highlighted in green. The formula **=IF(logical test,[value_if_true],[value_if_false])** is displayed in a large, bold, red font across the middle of the spreadsheet.

Product ID	Category	Price	Quantity	Total Price	Status	Date	Location	Sales	Profit
00001	Electronics	\$1,200	1	\$1,200.00	Active	2023-01-01	New York	100	\$1,000.00
00002	Electronics	\$2,500	1	\$2,500.00	Active	2023-01-01	New York	100	\$2,000.00
00003	Electronics	\$1,500	1	\$1,500.00	Active	2023-01-01	New York	100	\$1,000.00
00004	Electronics	\$1,445.00	1	\$1,445.00	Active	2023-01-01	New York	100	\$1,000.00
00005	Electronics	\$1,400.00	1	\$1,400.00	Active	2023-01-01	New York	100	\$1,000.00
00006	Electronics	\$1,350.00	1	\$1,350.00	Active	2023-01-01	New York	100	\$1,000.00
00007	Electronics	\$1,300.00	1	\$1,300.00	Active	2023-01-01	New York	100	\$1,000.00
00008	Electronics	\$1,250.00	1	\$1,250.00	Active	2023-01-01	New York	100	\$1,000.00
00009	Electronics	\$1,200.00	1	\$1,200.00	Active	2023-01-01	New York	100	\$1,000.00
00010	Electronics	\$1,150.00	1	\$1,150.00	Active	2023-01-01	New York	100	\$1,000.00
00011	Electronics	\$1,100.00	1	\$1,100.00	Active	2023-01-01	New York	100	\$1,000.00
00012	Electronics	\$1,050.00	1	\$1,050.00	Active	2023-01-01	New York	100	\$1,000.00
00013	Electronics	\$1,000.00	1	\$1,000.00	Active	2023-01-01	New York	100	\$1,000.00
00014	Electronics	\$950.00	1	\$950.00	Active	2023-01-01	New York	100	\$1,000.00
00015	Electronics	\$900.00	1	\$900.00	Active	2023-01-01	New York	100	\$1,000.00
00016	Electronics	\$850.00	1	\$850.00	Active	2023-01-01	New York	100	\$1,000.00
00017	Electronics	\$800.00	1	\$800.00	Active	2023-01-01	New York	100	\$1,000.00
00018	Electronics	\$750.00	1	\$750.00	Active	2023-01-01	New York	100	\$1,000.00
00019	Electronics	\$700.00	1	\$700.00	Active	2023-01-01	New York	100	\$1,000.00
00020	Electronics	\$650.00	1	\$650.00	Active	2023-01-01	New York	100	\$1,000.00
00021	Electronics	\$600.00	1	\$600.00	Active	2023-01-01	New York	100	\$1,000.00
00022	Electronics	\$550.00	1	\$550.00	Active	2023-01-01	New York	100	\$1,000.00
00023	Electronics	\$500.00	1	\$500.00	Active	2023-01-01	New York	100	\$1,000.00
00024	Electronics	\$450.00	1	\$450.00	Active	2023-01-01	New York	100	\$1,000.00
00025	Electronics	\$400.00	1	\$400.00	Active	2023-01-01	New York	100	\$1,000.00
00026	Electronics	\$350.00	1	\$350.00	Active	2023-01-01	New York	100	\$1,000.00
00027	Electronics	\$300.00	1	\$300.00	Active	2023-01-01	New York	100	\$1,000.00
00028	Electronics	\$250.00	1	\$250.00	Active	2023-01-01	New York	100	\$1,000.00
00029	Electronics	\$200.00	1	\$200.00	Active	2023-01-01	New York	100	\$1,000.00
00030	Electronics	\$150.00	1	\$150.00	Active	2023-01-01	New York	100	\$1,000.00

MUST USE OPERATORS IN LOGICAL FUNCTION

=IF(logical test,[value_if_true],[value_if_false])									
16	\$1.00	\$11,757.00	3		14		\$11,757.00	\$11,757.00	
17	\$0.00	\$5,193.00	1		15	WLS	\$5,193.00	\$5,193.00	
18	\$3,441.00	\$1,284.00	1		16		\$6,731.00	\$6,731.00	
19	\$146.41	\$1,000.00	1		17		\$4,137.48	\$3,289.00	
20	\$0.00	\$1,000.00	1		18		\$7,377.00	\$7,377.00	
21	\$0.00	\$1,000.00	1		19		\$2,504.00	#N/A	
22	-\$1,235.00	\$4,680.00	1		20	WLS	\$5,435.00	#N/A	
23	\$0.00	\$1,000.00	2		21		\$7,031.00	\$7,031.00	
24	\$0.00	\$3,943.00	1		22		\$3,943.00	#N/A	
25	\$0.00	\$1,000.00	1		23		\$4,197.00	#N/A	
26	\$0.00	\$1,000.00	1		24		\$6,234.00	#N/A	
27	\$0.00	\$6,279.00	2		25		\$6,279.00	#N/A	
28	\$0.00	\$16,424.00	4		26		\$16,424.00	#N/A	
29	\$0.00	\$1,084.00	2		27	WLS	\$1,084.00	#N/A	
30	\$0.00	\$10,392.00	2		28		\$10,392.00	#N/A	
31	\$0.00	\$3,878.00	1		29		\$3,878.00	\$3,878.00	
32	\$0.00	\$4,140.00	1		30		\$4,140.00	#N/A	
33	\$0.00	\$7,573.00	2		31		\$7,573.00	#N/A	
34	\$0.00	\$6,367.00	2		32		\$7,146.00	#N/A	
35	\$2,379.00	\$9,870.00	2		33		\$9,870.00	#N/A	
36	\$0.00	\$9,383.00	2		34		\$9,383.00	#N/A	

TYPES OF THE OPERATOR

6 logical operators:

= 'equals'

< 'less than'

> 'greater than'

<= 'less than or equal to'

>= 'greater than or equal to'

<> 'not equal to'

Parent Invoices													
Invoice ID	Invoice Amount	Parent ID	Invoice Date	Invoice Type	Invoice Status	Invoice Category	Invoice Subcategory	Invoice Subcategory	Invoice Subcategory	Invoice Subcategory	Invoice Subcategory	Invoice Subcategory	Invoice Subcategory
30008	\$0.00		\$11,757.00	3									
30017	\$0.00		\$5,193.00	1									
30035	\$3,645.00		\$5,086.00	1									
30044	\$540.45		\$7,529.20	1									
30050	\$0.00		\$7,377.00	2									
30099	\$0.00		\$7,377.00	2									
30118	\$0.00		\$7,377.00	2									
30133	\$0.00		\$7,377.00	2									
30142	\$0.00		\$3,943.00	1									
30151	\$0.00		\$4,197.00	1									
30160	\$0.00		\$8,204.00	0									
30168	\$0.00		\$6,278.00	2									
30197	\$0.00		\$18,826.00	4									
30204	\$0.00		\$9,386.00	2									
30213	\$0.00		\$10,092.00	2									
30222	\$0.00		\$3,838.00	1									
30240	\$0.00		\$4,160.00	1									
30259	\$0.00		\$7,875.00	2									
30268	\$2,279.00		\$8,667.00	2									
30277	\$0.00		\$9,970.00	2									
30292	\$0.00		\$7,383.00	2									
30357	\$200.00		\$5,449.00	1									

=IF(logical test,[value_if_true],[value_if_false])

EXAMPLE IF IN EXCEL

- Using following IF formulation we can see if the students have siblings or not ?

=IF(E4>=2,"Y","")

EXAMPLE IF IN EXCEL

- Using following IF formulation we can see how much discount parents get due to sibling discount eligibility (5%).

=IF(F4="Y",C4*5%,0)

2. LOGICAL FUNCTIONS: AND & OR

=IF(logical_test,[value_if_true],[value_if_false])

=AND(logical1, [logical2], ...)

=OR(logical1, [logical2], ...)

Up to 255 logical tests!

=AND(logical1, [logical2], ...)

If x & y & z are *all* true...

=OR(logical1, [logical2], ...)

If *any* of these are true: x, y, z ...

EXAMPLE AND & OR IN EXCEL

- Using AND function, where is both factors had to be true we can see the list of parent who have to pay an arrears penalty.

=AND(B4>0,C4<>"Y")

EXAMPLE AND & OR IN EXCEL

- Using OR function, where is one factors had to be true we can see the list of parent who have deserved Helper/volunteer discount.

=OR(I4>=I6,J4)

3. LOGICAL FUNCTIONS: IF WITH AND & WITH OR

=AND(logical1,logical2,...)

=OR(logical1,logical2,...)

TRUE/FALSE

Parent Invoices											
=IF(AND(logical1,logical2,...),[value_if_true],[value_if_false])											
30017	\$0.00		\$5,193.00	1		\$0.00	TRUE		TRUE	\$5,193.00	
30035	\$3,645.00		\$3,086.00	1		\$0.00	TRUE	5	FALSE	\$5,732.00	\$5,731.00
30044	\$548.45	Y	\$3,589.00	1		\$0.00	FALSE	8	FALSE	\$4,137.45	\$3,589.00
30053	\$0.00		\$7,377.00	2	Y	\$368.85	FALSE	0	FALSE	\$7,008.15	\$7,377.00
30099	\$0.00		\$3,554.00	1		\$0.00	FALSE	9	FALSE	\$3,554.00	#N/A
30115	-\$1,200.00		\$4,600.00	1		\$0.00	FALSE	0	TRUE	\$1,491.00	#N/A
30133	\$0.00		\$9,031.00	2	Y	\$401.35	FALSE	7	FALSE	\$8,579.45	\$7,377.00
30142	\$0.00		\$3,543.00	1		\$0.00	FALSE	2	FALSE	\$3,543.00	#N/A
30151	\$0.00		\$4,197.00	1		\$0.00	FALSE	14	TRUE	\$4,196.00	#N/A
30160	\$0.00		\$8,234.00	2	Y	\$411.70	FALSE	18	TRUE	\$7,821.30	#N/A
30177	\$0.00		\$8,113.00	2	Y	\$113.00	FALSE	0	TRUE	\$8,113.00	#N/A
30204	\$0.00		\$9,366.00	2	Y	\$469.30	FALSE	0	TRUE	\$8,915.70	#N/A
30213	\$0.00		\$10,092.00	2	Y	\$304.60	FALSE	10	FALSE	\$9,587.40	#N/A
30222	\$0.00		\$3,808.00	1		\$0.00	FALSE	3	FALSE	\$3,808.00	\$3,808.00
30240	\$0.00		\$4,160.00	1		\$0.00	FALSE	2	FALSE	\$4,160.00	#N/A
30259	\$0.00		\$7,875.00	2	Y	\$393.75	FALSE	1	FALSE	\$7,481.25	#N/A
30266	\$2,279.00		\$8,867.00	2	Y	\$443.35	TRUE	16	TRUE	\$10,702.65	#N/A
30277	\$0.00		\$9,970.00	2	Y	\$498.50	FALSE	0	FALSE	\$9,471.50	#N/A
30295	\$0.00		\$9,383.00	2	Y	\$449.15	FALSE	18	TRUE	\$8,932.85	#N/A
30357	\$200.00		\$5,449.00	1		\$0.00	FALSE	14	TRUE	\$5,249.00	#N/A
30366	\$0.00		\$4,429.00	2	Y	\$321.45	FALSE	10	FALSE	\$4,107.55	#N/A
30400	\$0.00		\$6,103.00	2	Y	\$445.15	FALSE	13	FALSE	\$5,657.85	#N/A

=IF(OR(logical1,logical2,...),[value_if_true],[value_if_false])

=IF(AND(logical1,logical2,...),[value_if_true],[value_if_false])

Parent Invoices												
Invoice #	Amount	Invoice Date	Invoice Type	Invoice Status	Invoice Amount	Invoice Date	Invoice Status	Invoice Amount	Invoice Date	Invoice Status	Invoice Amount	Invoice Date
30006	\$0.00			Y	\$587.65	FALSE	16	TRUE	\$11,188.15	\$11,757.00		
30017	\$0.00				\$0.00	FALSE	0	TRUE	\$5,192.00	\$5,193.00		
30035	\$3,445.00				\$0.00	TRUE	3	FALSE	\$5,720.00	\$6,731.00		
30044	\$540.45	Y			\$0.00	FALSE	4	FALSE	\$4,137.45	\$3,589.00		
30053	\$0.00				\$366.85	FALSE	0	TRUE	\$7,296.15	\$7,296.15		
30115	\$0.00				\$0.00	FALSE	0	TRUE	\$3,447.00	\$3,447.00		
30133	\$0.00			Y	\$457.55	FALSE	7	FALSE	\$8,579.45	\$7,377.00		
30142	\$0.00				\$0.00	FALSE	2	FALSE	\$3,943.00	\$N/A		
30151	\$0.00				\$0.00	FALSE	16	TRUE	\$4,196.00	\$N/A		
30160	\$0.00			Y	\$411.70	FALSE	18	TRUE	\$7,821.30	\$N/A		
30168	\$0.00			Y	\$313.90	FALSE	18	TRUE	\$5,963.10	\$N/A		
30197	\$0.00			Y	\$931.30	FALSE	0	FALSE	\$12,694.70	\$N/A		
30204	\$0.00			Y	\$469.20	FALSE	0	TRUE	\$5,915.70	\$N/A		
30212	\$0.00			Y	\$904.60	FALSE	10	FALSE	\$9,587.40	\$N/A		
30222	\$0.00				\$0.00	FALSE	3	FALSE	\$3,830.00	\$3,838.00		
30240	\$0.00				\$0.00	FALSE	2	FALSE	\$4,160.00	\$N/A		
30259	\$0.00			Y	\$395.75	FALSE	1	FALSE	\$7,481.25	\$N/A		
30266	\$2,279.00			Y	\$445.35	TRUE	16	TRUE	\$10,702.55	\$N/A		
30277	\$0.00			Y	\$498.50	FALSE	0	FALSE	\$9,471.50	\$N/A		

EXAMPLE IF WITH AND & WITH OR IN EXCEL

- Using following IF with AND function, where is both factors had to be true we can see the amounts of penalty for each.

=IF(AND(B4>0,D4<>"Y"),B4*10%,0)

EXAMPLE IF WITH AND & WITH OR IN EXCEL

- Using following IF with OR function, where is one factors had to be true we can see the amount of volunteer discount.

=IF(OR(J4>=16,K4),250,0)

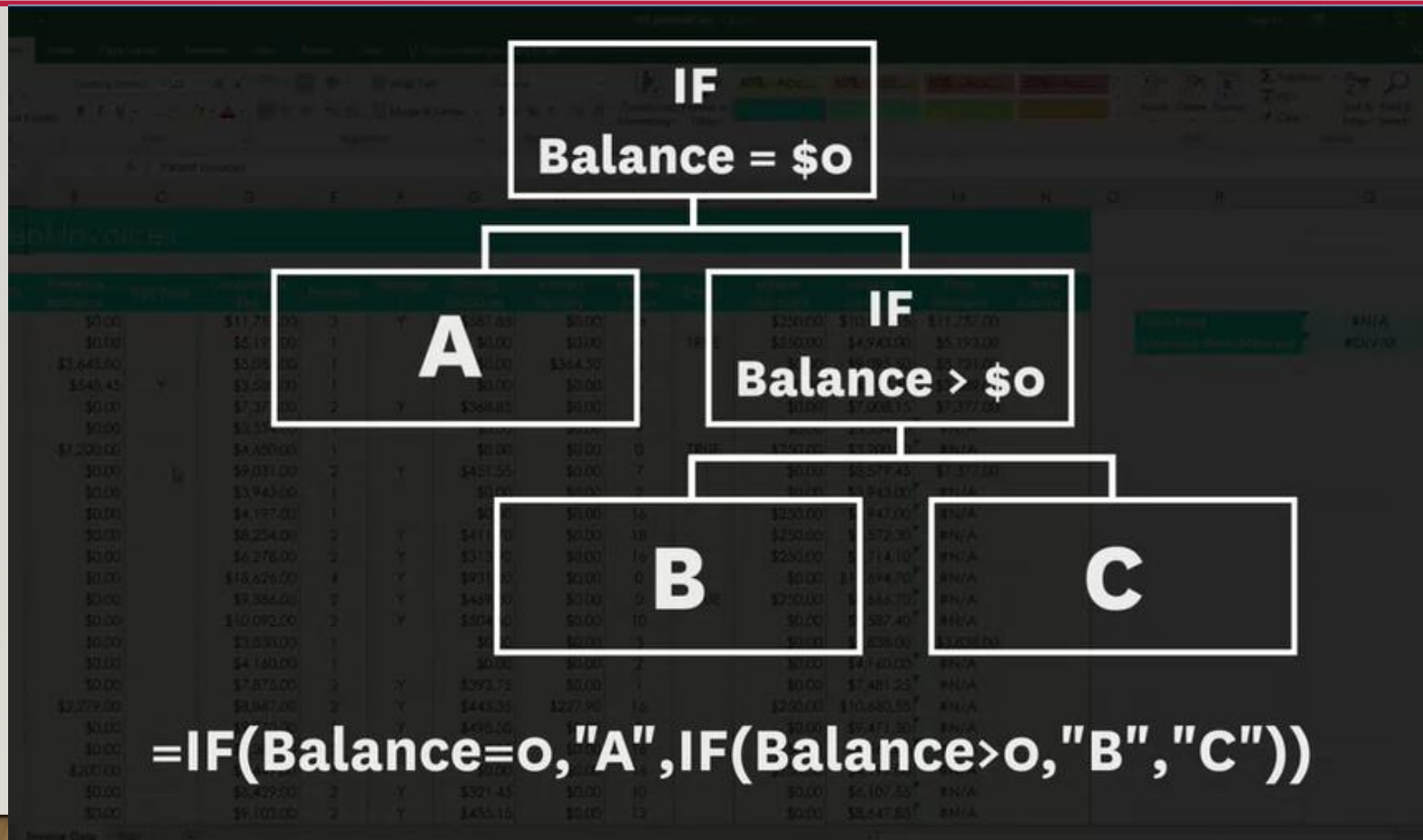
4. LOGICAL FUNCTIONS: NESTED IFS

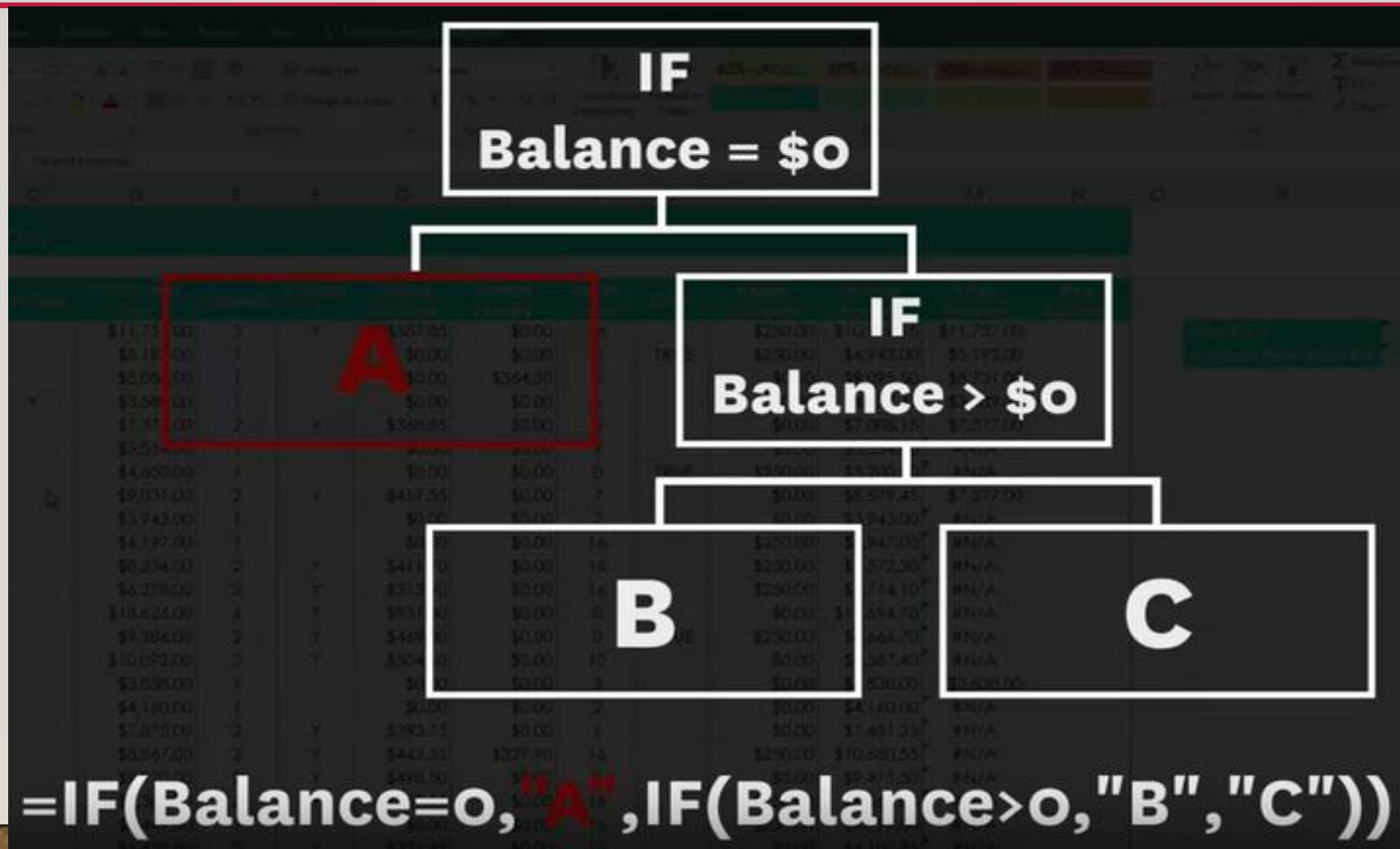
Parent Categories

A. Balance paid

B. Balance in arrears

C. Balance in credit





IF
Balance = \$o

A

IF
Balance > \$o

B

C

=IF(Balance=o,"A",IF(Balance>o,"B","C"))

IF
Balance = \$0

A

IF
Balance > \$0

B

C

=IF(Balance=0,"A",IF(Balance>0,"B","C"))

IF
Balance = \$0

A

IF
Balance > \$0

B

C

=IF(Balance=0,"A",IF(Balance>0,"B","C"))

EXAMPLE NESTED IFS IN EXCEL

- Using following NestedIF formulation we can see who are in which category.

=IF(B4=0,"A",IF(B4>0,"B","C"))

EXAMPLE NESTED IFS IN EXCEL

- Using following NestedIF formulation we can see what is the sibling discount amounts depends on their category.

=IF(F4=1,0,IF(F4=2,E4*5%,E4*8%))

5. LOGICAL FUNCTIONS: IFERROR AND IFNA

- #DIV/0! – Means basically you are trying to divide something by zero.
- #N/A – this actually stands for Not Applicable, it does not find something you are looking for.

EXAMPLE IFERROR AND IFNA IN EXCEL

- Miscalculations can be fixed but sometimes, we get an error because the inputs are wrong or missing. Thus using IFERROR we can fix wrong or missing inputs (#DIV/0!)

=IFERROR(AVERAGE('Invoice Data'!\$O\$4:\$O\$654),"

EXAMPLE IFERROR AND IFNA IN EXCEL

- Just completing empty cell “New Balance”
 $=B4+M4-N4$

EXAMPLE IFERROR AND IFNA IN EXCEL

- Fixing the cell which is referred to other spreadsheet in the excel. Using IF Not Applicable function (#N/A).

=IFNA(VLOOKUP('Invoice
Data'!\$A4,BPay!\$B\$4:\$D\$10,3,0),0)

THANK YOU