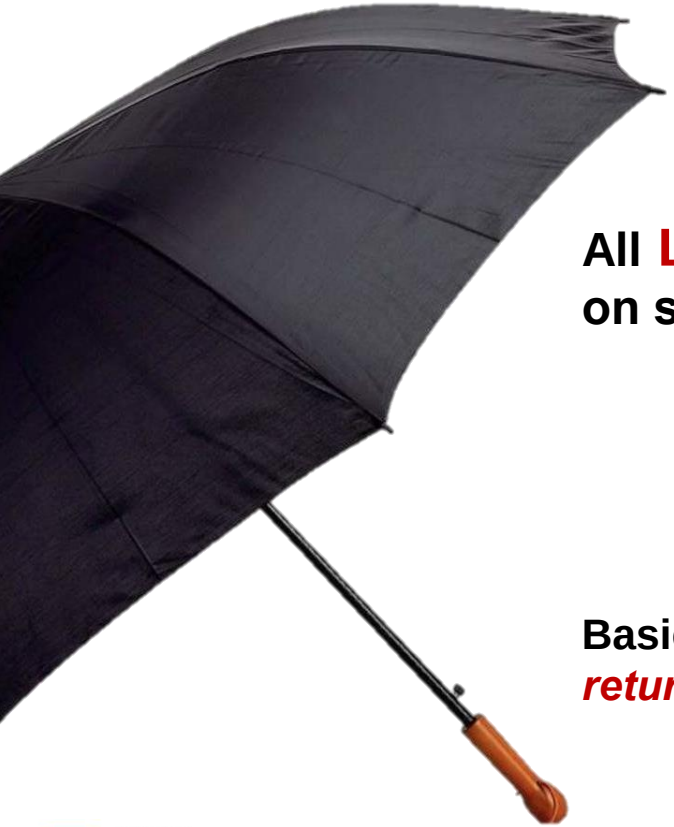

All Logical Operators in Excel are based on simple "IF/THEN" statements:

*-**IF** it's raining, **THEN** bring an umbrella*
*-**IF** it's sunny, **THEN** bring sunglasses*
*-**IF** it's sunny **AND** it's summer, skip work and go to the beach*

Basically it just says *"Hey Excel, if this statement is true, return this value. Otherwise, return something else."*

=IF(logical_test, [Value if True], [Value if False])

Any test that results in either **TRUE** or **FALSE**

(*i.e. A1="Google", B2<100, etc*)

Value returned if logical test is **TRUE**

Value returned if logical test is **FALSE**

	A	B	C	D
1	Location	Temp (F)	Precip (mm)	Freeze
2	A	75	0	No
3	B	18	0	Yes
4	C	86	0	No
5	D	80	2.3	No
6	E	28	1.2	Yes
7	F	68	0.5	No
8	G	26	0	Yes

= IF(B2<=0,"Yes","No")

In this case we're categorizing the Freeze column as "Yes" if the temperature is equal to or below 32, otherwise "No"

By using Nested IF Statements, you can include multiple logical tests within a single formula:

	A	B	C	D	E
1	Location	Temp (F)	Precip (mm)	Freeze	Climate
2	A	75	0	No	Mild
3	B	18	0	Yes	Cold
4	C	86	0	No	Hot
5	D	80	2.3	No	Mild
6	E	28	1.2	Yes	Cold
7	F	68	0.5	No	Mild
8	G	26	0	Yes	Cold

= IF(B2<40,"COLD",IF(B2>80,"HOT","MILD"))

If temp<40, climate = "Cold", if temp>80, climate = "Hot", otherwise climate = "Mild"

Excel's AND and OR statements allow you to include multiple logical tests at once:

	A	B	C	D	E	F	G
1	Location	Temp (F)	Precip (mm)	Freeze	Climate	Precip Type	Conditions
2	A	75	0	No	Mild	None	Dry
3	B	18	0	Yes	Cold	None	Dry
4	C	86	0	No	Hot	None	Dry
5	D	80	2.3	No	Mild	Rain	Wet
6	E	28	1.2	Yes	Cold	Snow	Wet
7	F	68	0.5	No	Mild	Rain	Wet
8	G	26	0	Yes	Cold	None	Dry

=IF(OR(F2="Rain",F2="Snow"),"Wet","Dry")

Here we're categorizing conditions as "Wet" if the precipitation type equals "rain" OR "snow", otherwise Conditions = "Dry"

=IF(AND(D2="Yes",C2>0),"Snow",IF(AND(D2="No",C2>0),"Rain","None"))

If the temp is below freezing AND the amount of precipitation > 0, then Precip Type = "Snow", if the temp is above freezing AND the amount of precipitation >0, then Precip Type = "Rain", otherwise Precip Type = "None"

PRO TIP:

When writing nested functions, copy/paste repetitive pieces and tweak individual elements to save time (rather than starting from scratch)

EXCEL MAVEN

If you want to evaluate a case where a logical statement is *not* true, you can use either the NOT statement or a "<>" operator

	A	B	C	D	E	F	G
1	Location	Temp (F)	Precip (mm)	Freeze	Climate	Precip Type	Conditions
2	A	75	0	No	Mild	None	Dry
3	B	18	0	Yes	Cold	None	Dry
4	C	86	0	No	Hot	None	Dry
5	D	80	2.3	No	Mild	Rain	Wet
6	E	28	1.2	Yes	Cold	Snow	Wet
7	F	68	0.5	No	Mild	Rain	Wet
8	G	26	0	Yes	Cold	None	Dry

=IF(NOT(C2=0),"Wet","Dry")

=IF(C2<>0,"Wet","Dry")

In both of these examples, we're defining Conditions = "Wet" if the amount of precipitation is NOT equal to 0

The IFERROR statement is an excellent tool to eliminate annoying error messages *(#N/A, #DIV/0!, #REF!, etc.)*, which is particularly useful for front-end formatting

=IFERROR(value, value_if_error)

Formula or value that may or may not result in an error

Value returned in the case of an error

PRO TIP:

If you're writing a formula that may trigger an error (i.e. a VLOOKUP where not all values have a match), WRITE THE FULL FORMULA FIRST then wrap it in an IFERROR statement

Excel offers a number of different IS formulas, each of which checks whether a certain condition is true:

ISBLANK = *Checks whether the reference cell or value is blank*

ISNUMBER = *Checks whether the reference cell or value is numerical*

ISTEXT = *Checks whether the reference cell or value is a text string*

ISERROR = *Checks whether the reference cell or value returns an error*

ISEVEN = *Checks whether the reference cell or value is even*

ISODD = *Checks whether the reference cell or value is odd*

ISLOGICAL = *Checks whether the reference cell or value is a logical operator*

ISFORMULA = *Checks whether the reference cell or value is a formula*