



Excel Logic & the IF Function

- Comparison Operators
 - You can use comparison operators to compare two numbers, functions, formulas, or labels and return either true or false.
 - Examples include:
 - `=2*3=4+2`
 - `=A1>0`
 - `=average(a1:a10)>60`
- Every conditional test must include at least one comparison operator. As an example, in the formula `=A1>0`, the comparison operator is `>`

Comparison Operators

- The following six comparison operators exist in Excel:

Comparison Operator

Definition

=

Equal to

<>

Not equal to

<

Less than

<=

Less than or equal to

>

Greater than

>=

Greater than or equal to

Built-in IF Function

- The IF function allows our spreadsheet to ***make a decision*** when analyzing the data.
- The function asks the question: Is some condition true or false?
- If the condition is true, the function returns one value; if the condition is false, the function returns another value
- Our task: choose the correct conditions to check

IF Function Syntax

=IF(logical_test,value_if_true,value_if_false)

Example:

=IF(speed>55,"TICKET","SAFE")

=IF(average(A1:D1) >= 60, "PASS", "FAIL")

Problem 5.1

- The following worksheet shows activity on a bank account where a W implies an amount of money withdrawn and a D is a deposit.

	A	B	C	D
1	Initial Balance	\$3,874.00		
2				
3	Date	Amount	Type	Balance
4	1/2/2012	\$ 34.50	W	\$3,839.50
5	1/4/2012	\$ 100.00	D	\$3,939.50
6	1/5/2012	\$ 20.00	W	\$3,919.50

- Write the formulas needed in cells D4 and D5 so we can fill down

Logical Operators

- Logical OR
 - `OR(logical_test#1,logical_test#2)`
- A value of TRUE is returned if EITHER of the logical tests returns a value of TRUE; otherwise, a value of FALSE is returned
 - `=IF(OR(temperature > 90, weather = "RAIN"),"Yuck", "Pleasant")`
- Note: You can have more than two logical tests

Logical Operators

- Logical AND
 - `AND(logical_test#1,logical_test#2)`
- A value of TRUE is returned if BOTH of the logical tests returns a value of TRUE; otherwise, a value of FALSE is returned
 - `=IF(AND(temperature > 90, weather = "RAIN"), "Awful", "could be worse")`
- Note: You can have more than two logical tests

Problem 5.2

<http://zeus.cs.pacificu.edu/shereen/cs130w12/Lectures/05Problem5.2.html>

	A	B	C	D	E
1	Name	District	Sales	Emp. Yrs	Job Level
2	Linda	East	\$20,000.00	2	
3	Joe	West	\$42,302.00	9	
4	Bill	East	\$53,001.00	3	
5	Mary	South	\$12,000.00	12	
6	Mark	South	\$ 2,050.00	6	
7	John	North	\$9,000.00	0	
8	Ted	East	\$40,000.00	4	

Write a formula in column E that will assign a job level based on two different criteria:

Salespeople who have been employed for more than 5 years AND have annual sales of more than \$10,000 should be assigned a job level code of 2. All others should have a job level code of 1.

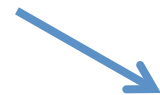
Problem 5.2 continued

- Add a Bonus column to the right of the table
 - An employee gets a 10% bonus if they have either worked for more than 5 years or done more than \$7,000 in sales
 - Otherwise they get a 1% bonus

Problem 5.3 Soccer Scores

<http://zeus.cs.pacificu.edu/shereen/cs130w12/Lectures/05Problem5.3.html>

Use an If() to fill in this column!



Opponent	Pacific's Score	Opponent's Score	Win/Loss/Tie
Warner Pacific	4	3	Win
Trinity Lutheran	3	1	Win
Walla Walla	5	0	Win
Cal Lutheran	2	1	Win
UC Santa Cruz	0	0	Tie
Whitworth	2	1	Win
Whitman	4	0	Win
Linfield	1	0	Win
Willamette	2	1	Win
Puget Sound	0	0	Tie
Pacific Lutheran	0	1	Loss

Problem 5.4

<http://zeus.cs.pacificu.edu/shereen/cs130w12/Lectures/05Problem5.4.html>

- Output the rate of commission that a salesperson receives based on the amount of sales they have generated for that month. Commissions are based on the following:
- From \$1 to \$10 earns 10% commission
- From \$10.01 to \$100 earns 15% commission
- Anything over \$100 earns 20% commission

Problem 5.4 Continued

Use an If() to fill in this column!

Calculate this column!

	A	B	C
	Amount of Sales	Commission Rate	Amount of Commission
1	\$15.00	15.00%	\$2.25
2	\$253.00	20.00%	\$50.60
3	\$10.00	10.00%	\$1.00
4	\$84.00	15.00%	\$12.60
5	\$12.00	15.00%	\$1.80
6	\$5.00	10.00%	\$0.50
7	\$32.00	15.00%	\$4.80
8	\$56.00	15.00%	\$8.40
9	\$150.00	20.00%	\$30.00
10	\$120.00	20.00%	\$24.00

More on importing from the Web

- Right click the area of the spreadsheet imported from the web
 - Refresh: pulls the data down from the same web page again. If the web page changed, this will change the data in your spreadsheet
 - Edit Query: change the webpage that provides the data to the spreadsheet.
 - Data Range Properties: Enable auto-refresh, control auto-formatting, etc.