Excel Logic & the IF Function
or
Let's make a decision!

- ## Comparison Operators
  - Compare two values and produce 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

CS130 - Excel Logic & the IF Function

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")

CS130 - Excel Logic & the IF Function

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- The following worksheet shows activity on a bank account where a W implies an amount of money withdrawn and a D is a deposit.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	1/12/2011	$34.50	W	$3,839.50	
5	1/4/2011	$100.00	D	$3,939.50	
6	1/5/2011	$20.00	W	$3,919.50	
7					

- Write the formula needed in cell D4 so we can fill down

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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

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If/And/Or

- What decision do you need to make?

- What data will you base your decision on?

- How can you write the decision as a condition?

- What actions will you take?

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Problem 5.2

Inspect the data!

	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.

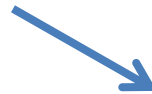CS130 - Excel Logic & the IF Function

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

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Problem 5.2.1 Soccer Scores

http://zeus.cs.pacificu.edu/ryand/cs130/fall11/SoccerScores.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

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Problem 5.3

http://zeus.cs.pacificu.edu/ryand/cs130/fall11/Problem53.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

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Problem 5.3 Continued

Calculate this column!

Use an If() to fill in 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

Problem 5.4

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
Minimum	**Maximum**	**Commission**	
$1.00	$10.00	10%	
$10.01	$100.00	15%	
$100.01	–	20%	

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.