

Excel Logic & the IF Function

or

Let's make a decision!

- Comparison Operators
 - Compare two values and produce either **true** or **false**
 - =2*3=4+2
 - =A1>0
 - =average(a1:a10)>60
- Must include at least one comparison operator.

> >= =
< <= <>

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**?
- Perform a different action for **true** or **false**.
- Our task: choose the correct conditions to check

IF Function Syntax

=IF(condition, action_if_true, action_if_false)

Example:

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

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

Problem 5.1

- Bank account statement where a W implies an amount of money withdrawn and a D is a deposit.

	A	B	C	D	E
1	Initial Balance	\$3,874.00			
2					
3	Date	Amount	Type	Balance	Amount Over \$50?
4	1/12/2012	\$34.50	W		
5	2/12/2012	\$100.00	D		
6	2/29/2012	\$20.00	W		

- Write the formula needed in E4 to E6 to display Yes or No
- Write the formula for column D

Logical Operators

- Logical OR
OR(condition#1, condition#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(condition#1, condition#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")**

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?

Problem 5.2

<http://zeus.cs.pacificu.edu/shereen/cs130w14/Problem5.2.html>

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.

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
- The bonus column should display the bonus amount in dollars (10% of \$20,000 is \$2,000)

Problem 5.3 Soccer Scores

<http://zeus.cs.pacificu.edu/shereen/cs130w14/SoccerScores.html>

Use an If() to fill in this column!

Calculate these columns!



Opponent	Pacific's Score	Opponent's Score	Win/Loss/Tie	Wins	Losses	Ties
Warner Pacific	4	3	Win	1	0	0
Trinity Lutheran	3	1	Win	2	0	0
Walla Walla	5	0	Win	3	0	0
Cal Lutheran	2	1	Win	4	0	0
UC Santa Cruz	0	0	Tie	4	0	1
Whitworth	2	1	Win	5	0	1
Whitman	4	0	Win	6	0	1
Linfield	1	0	Win	7	0	1
Willamette	2	1	Win	8	0	1
Puget Sound	0	0	Tie	8	0	2
Pacific Lutheran	0	1	Loss	8	1	2

Wins, Losses, Ties for Men's Soccer

5.3 Pie Chart



- Let's build a Pie Chart of the final Wins/Losses/Ties
- Y Values are the numeric values
 - Bottom of the chart
- Horizontal (Category) Axis Labels are the Labels Wins, Losses, Ties

Problem 5.4

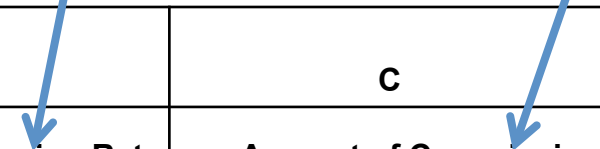
<http://zeus.cs.pacificu.edu/shereen/cs130w14/Problem5.4.html>

- 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
1	Amount of Sales	Commission Rate	Amount of Commission
2	\$15.00	15.00%	\$2.25
3	\$253.00	20.00%	\$50.60
4	\$10.00	10.00%	\$1.00
5	\$84.00	15.00%	\$12.60
6	\$12.00	15.00%	\$1.80
7	\$5.00	10.00%	\$0.50
8	\$32.00	15.00%	\$4.80
9	\$56.00	15.00%	\$8.40
10	\$150.00	20.00%	\$30.00
11	\$120.00	20.00%	\$24.00

Problem 5.5

Use an If() to fill in this column!

Calculate this column!

	A	B	C
1	Amount of Sales	Commission Rate	Amount of Commission
2	\$15.00	15.00%	\$2.25
3	\$253.00	20.00%	\$50.60
4	\$10.00	10.00%	\$1.00
5	\$84.00	15.00%	\$12.60
6			
7	Minimum	Maximum	Commission
8	\$1.00	\$10.00	10%
9	\$10.01	\$100.00	15%
10	\$100.01	-	20%

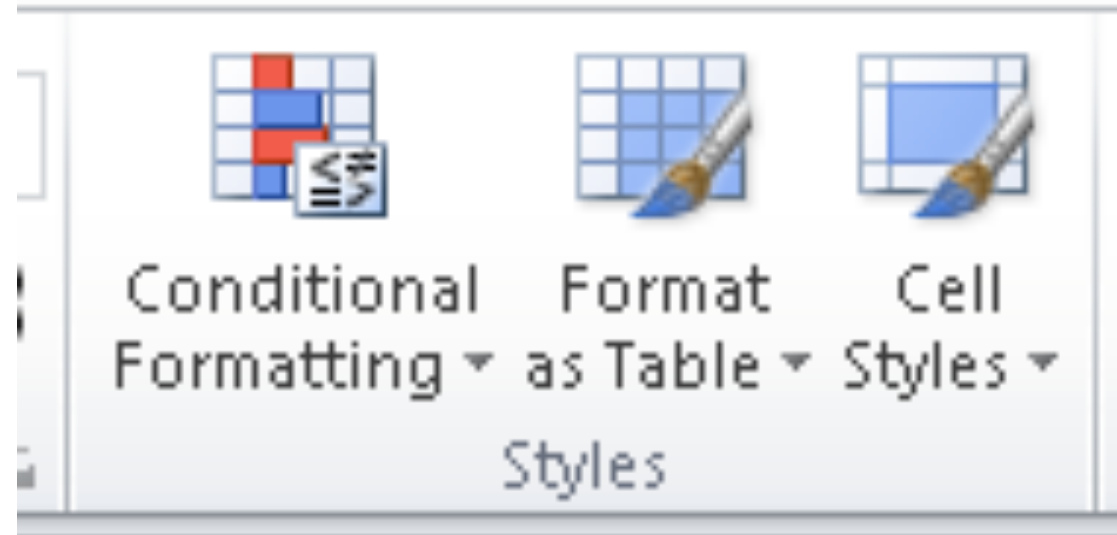
Use the table below to set the rates.

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.

Conditional Formatting

Format the Cell based on the data the cell contains.



Problem 5.6 - Grades

<http://zeus.cs.pacificu.edu/shereen/cs130w14/Problem56.pdf>

- Copy and paste the top table into Excel.
- Did the table copy and paste correctly?

- Copy and paste the bottom table into Excel.
- Did the table copy and paste correctly?

Grades

- Add two additional columns to the top table as follows:
 - Average is a person's total points divided by the max points possible
 - Letter Grade shows the student's letter grade in the course
90-100 A, 80-90 B, 70-80 C, 60-70 D, 0-60 F.

Grades

- Create a Pie Chart that shows the percentage of A's, B's, etc.
- You will need to add cells calculating the number of A's, number of B's, etc. Hint: you will need to use the COUNTIF function.
- You can look up how it works in Excel help

Import the weather data from here
<http://w1.weather.gov/obhistory/KHIO.html>

- Use conditional formatting to highlight the Weather column blue when there was any type of Rain
- Use conditional formatting to highlight the Air temperature column (green) when the Air temp was less than the Dew Point.
- Add a column Change that displays the word: Warmer, Colder, or Same if the temperature is going up, down, or staying the same from the previous hour.