



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- Bank account statement where a W implies an amount of money withdrawn and a D is a deposit.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 | Over \$50? |
| 4 | 9/1/2012 | \$34.50 | W | | |
| 5 | 9/5/2012 | \$100.00 | D | | |
| 6 | 9/12/2012 | \$20.00 | W | | |

- Write the formula for column D.
- Write the formula needed in E4 to E6 to display Yes or No depending on if the amount is over \$50.

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/cs130f12/Problem52.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 \$20,000 in sales
 - Otherwise they get a 1% bonus

Problem 5.3: Soccer Scores

<http://zeus.cs.pacificu.edu/shereen/cs130f12/Problem53.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 |

5.3 Pie Chart

**Wins, Losses, Ties for
Men's Soccer**



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

Problem 5.4

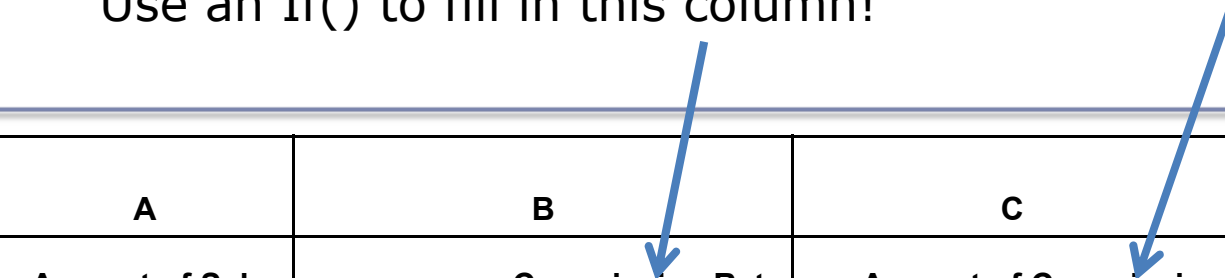
<http://zeus.cs.pacificu.edu/shereen/cs130f12/Problem54.html>

- 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 |

<http://zeus.cs.pacificu.edu/shereen/cs130f12/Problem55.html>

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% |

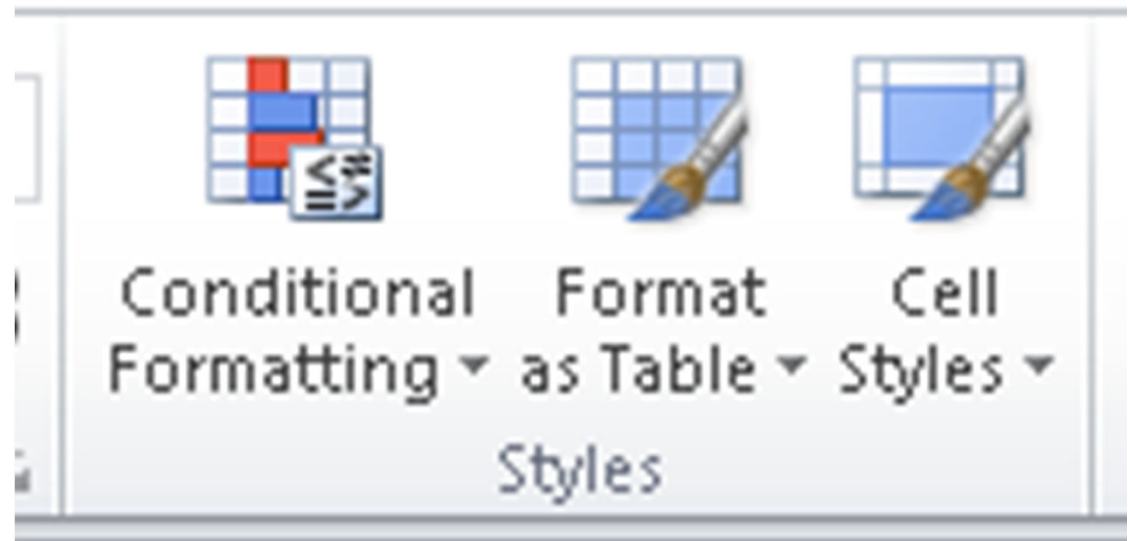
Use the table below to set the rates.

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/cs130f12/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 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