Advanced Excel functions and array functions

DSC340
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Useful standard functions
- Text and logic functions
- "Lookup" functions
- Conditional counting / summing

Array functions

Nice tip when using any formulae in Excel

- You can toggle between the "results view" and "formula view" in Excel by clicking the key combination `CTRL -`

(The `ctrl` key and the `left single quote`, together)

Excel text functions in action

- Goal: extract the username and domain strings from the email address (in cell A2).
- You may have a list of 1000's of email addresses to go through... need to use functions to get it done

Excel text functions

- Functions that return part of the text within a text cell
  - LEFT(text, num_chars)
  - RIGHT(text, num_chars)
  - MID(text, start_num, num_chars)
- Function that identifies the starting position of some text within a cell
  - FIND(find_text, within_text)

Excel text functions in action

- Concatenating cells' text
- Two options
  - `=CONCATENATE`
  - `&`
Excel logic functions

- The core logic functions are:
  - AND
    - `=AND("T/F condition", "T/F condition")`
  - OR
    - `=OR("T/F condition", "T/F condition")`
  - NOT
    - `=NOT("T/F condition")`
  - IF
    - `=IF("T/F condition", true-result, false-result)`

Let's look at some examples in the accompanying spreadsheet.

Excel "Lookup" functions

- Useful functions for finding values in a range of cells include:
  - LOOKUP
  - VLOOKUP
  - HLOOKUP

- You should know these from prior work with Excel.

A different approach for finding a particular cell: the OFFSET function

- OFFSET
  - Allows you to return the value of any cell by specifying its location in your spreadsheet relative to another cell.
  - Syntax:
    - `=OFFSET(reference_cell, rows_down, cols_right)`

OFFSET function example

Conditional counting/summing

- Example: Count how many "Jan" sales months there are.
  - `=COUNTIF(A2:A10,"Jan")`
- Example: compute total sales across all "Jan" months.
- Nice trick: Compute total sales where month is "Jan" or "Mar."

POA

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Excel range calculations (often called “array functions”)

- Normally, you think about calculations in terms of working with two “single cells”
- But often in spreadsheet work, you have calculations that span entire ranges
  - Such are called array type calculations
- To signal to Excel that your calculation is an array type calculation, use CTRL-SHIFT-RETURN instead of just hitting the RETURN key
- Array calculations can involve standard functions:
  - e.g., *, COUNTIF
- There are also specific Excel array functions:
  - =FREQUENCY()

Example: Compute total sales where month is “Jan” and region is “North”
- Array function: when you enter this formula, use Ctrl+Shift+Enter
  - =SUM((A2:A10="Jan") * (B2:B10="North") * C2:C10)

Multiplying 0 and 1 values

Example: Compute total sales where month is “Jan” and the sales value is 200 or more.
- Array function:
  - =SUM((A2:A10="Jan") * (C2:C10>=200) * C2:C10)

Example: Compute total sales that are between 300 and 400.
- Array function:
  - =SUM((C2:C10>=300)*(C2:C10<=400)*(C2:C10))