**Assorted Topics**

- Nesting IF functions: Review =IF(logical_test, value_if_true, value_if_false). To nest an if function you place an additional IF function in either the true or false value to run an additonal logical test. Excel will test the first IF statement and then take the values that did or did not meet that criteria and run an additional logical test stated in the second IF statement on those values. Remember the proper use of quotes and parentheses.

- Example of Nesting "=IF(H5>380,"High",IF(H5<340,"Low","Middle"))" Excel tests if H5 is greater than 380, if so it returns the value "High" , if not it runs a second logical test. So it already knows H5 is less than 380 from the first statement. In the second statement it asks if H5 is less than 340 and returns "Low" if true and "Middle" if false. Note that for Excel to return "Middle" the value in H5 has to be between 340 and 380.

- Sparklines: Inserts small graphs of data in a single cell to depict general trends. Select cell for Sparkline → Insert → Sparklines: Lines → Choose Data Range → Location for Sparkline should already be correct if first step done correcly → If references done properly you can drag it down to fill in for multiple rows.

- Inserting a comment: Right click on cell → Insert Comment → Type in Comment. A red triangle appears in upper right corner to depict cells with comment. Can edit or delete by right clicking on cell. This can also be done through the Review Tab on the ribbon.

- Show all Formulas: If you want to see what cells contain formulas and what those formulas are. Can toggle back and forth using CTRL+' (tilde located beside the number 1 on a standard keyboard). Can also go to Excel Options under advanced or Ribbon → Formulas → Show Formulas.

- MATCH: looksup a value in an array and returns the row number. "=MATCH(lookup_value,lookup_array,0)". Lookup value is the reference to the value you want to lookup in the table. Table array is the the table(column) you want to lookup the value in. 0 requires an exact match (often the desired option)

- INDEX: Given an array and a row number returns the value located in that specific cell. "=INDEX(array,row_number) Array is the set of cells (column) that you want a value returned from. Row number is the row of the array that you want the value returned for.

- Improved VLOOKUP: you can combine INDEX and MATCH for a better VLOOKUP that performs the same task without the criteria required for VLOOKUP to function properly

- "=INDEX(array,MATCH(lookup_value,lookup_array,0))"

- Dropdown list: For a given cell creates a a dropdown list where certain values can be selected. Similar to when filling out a form and you can pick your state from the list of US states. Select cell → Data → Data Validation → Allow: List → Select Source (values you want to be able to pick from). A triangle should appear to access dropdown list.

- Text to Columns: Useful tool to separate data into columns based on a delimited character. Select single column of data → Data → Text to Columns → Select Delimited → Click Next → Select your delimited character (this is what is currently being used to separate the data in your selection) → Finish. After selecting a delimiter Excel will show you the Data preview so you can check that it is performing the task as desired.

- SUBSTITUTE: takes a value in a cell and substitutes a new string of characters for a given existing string. "=SUBSTITUTE(text,old_text,new_text)" , where text is the cell reference to the text you want to change, old text is what string you want to replace, and new text is what you want to replace the new text with.

- Paste values: if you copy and paste as values the cell will no longer contain a formula and will just be the value.

- SMALL/LARGE: returns the $n^{th}$ largest or smallest from an array. "=SMALL(array,k)" or "=LARGE(array,k)". Remember absolute and relative references.

- Charts with two vertical axes: After graphing the data (review: Select data → Insert → Scatter Plot). Click in graph → Ribbon → Chart Tools: Design → Change Chart Type → All Charts: Combo → Select the Chart Type for each series and then select which series is Secondary axis by clicking on box under Secondary axis. Excel will preview the graph before clicking ok to update.

- Transposing data: Essentially taking a table and interchanging rows and columns i.e. if I have two rows and 5 columns in original table I want to create a table with two columns and five rows.

- Copy and paste transpose: Maintains formatting but does not update if original table is changed. Select original table → Click on cell for placing top left cell of new table → Ribbon: Home → Arrow below Paste → Paste Transpose. Can also right click and select Paste transpose.

- TRANSPOSE: Select the transposed array starting in top left corner (which is the the opposite of rows and columns for original table, i.e. if original table is 2x10 select 10x2). → Enter "=TRANSPOSE(array), where array is original table you want to transpose → CTRL+SHIFT+ENTER (do not just hit ENTER, it will not work. Note: dates may change as Excel does not maintain formatting.

- "=TODAY()" Returns the current date.

- "=NOW()" Returns the current date and time.

- "=WEEKNUM(date reference(serial number))" Returns the week number of the year for the entered date.

- "=NETWORKDAYS(start_date,end_date)" Returns the number of workdays (excluding weekend and holidays) between two dates.

- "=WORKDAY(start_date, days)" Returns serial number (excels way of storing dates, can change using home format date) of a date before or after a specified number of working days from a given date. Remember how to convert serial number date to more readable date.

- Trace precedents and dependents: Ribbon → Formulas → Trace Dependents/Precedents. This is useful for seeing if a cell is being used in a formula or if what cells are being used by selected cell, i.e., locates input and outputs of a cell.

- Delete duplicate observations: Select table → Ribbon: data → Remove Duplicates → Select criteria for duplicates (which columns are included for duplicate values).

- COUNT: Returns the count of the number of cells that contain a number (does not count text). "=COUNT(select array)"

- COUNTA: Returns the count of the number of cells that are non-empty (counts text and numbers). "COUNTA(select array)"

- SUMIFS: Sums a range of cells only if a given criteria is met, works for multiple criteria. "=SUMIFS(sum_range,criteria_range1,criteria1,...)" , where the sum range is the groups of cells containing the values you want to take the sum of, criteria range contains the cells where you want to evaluate a certain criteria, and criteria contains the criteria you want evaluated, can use "" or cell reference for criteria.

- Print area: Prints only a selected array of the sheet. Select array → Ribbon → Page Layout → Print area → Set Print area (clear print area to reset).

- Working with shapes and text

  - Insert text box: Ribbon → Insert → Text Box → Drag to create box. Can format text in box just as we formatted text in a cell. While text box is selected new format tab appears in the ribbon. Can be used for additional formatting

  - Insert a shape: Ribbon → Insert → Shapes → Select desired shape. → Drag desired shape. Can change formatting using new format tab in ribbon. Ex. Shape effects: Bevel and shadows.

  - Combining a text box and a shape: First you can bring forward or send backwards inserted text boxes and shapes to change what layer the item is located. Ribbon → Format → Bring forward/Send Backward. Use CTRL to select both the text box and shape (after placing each item in desired location. Now you can align using Format → Align and can group into one item by using Format → Group.

- Random Numbers

  - RAND() returns a decimal number between 0 and 1 from a uniform distribution (each decimal is equally likely)

  - Return the result of a coin flip: "=IF(RAND()>.5,"Heads","Tails")"

  - RANDBETWEEN(bottom,top) Returns an integer between a given bottom and top number.

  - CHOOSE(index_num,value1, value2,...,valuen). Given an index number returns the indicated value i.e for index equal to 1 returns the input under value1.

  - Returning a random month of the year. "=CHOOSE(RANDBETWEEN(1,12),"Jan","Feb","Mar","Apr","

- Forecasting: Simple introduction to using forecasting in Excel. Select dates and values → Ribbon → Data → Forecast Sheet → Previews forecast and allows changing of options. → Click create and enters forecast into new sheet.

- Upper (lower) bound is the highest (lowest) possible value given our confidence interval.

- Be aware that forecast does not always do a good job.

**What to Know for Exam**

- Nesting functions. IF and MATCH/INDEX

- MATCH, INDEX, and combining them to perform a task similar to VLOOKUP

- Sparklines

- Show formulas

- Inserting Comments

- Dropdown lists

- Text to Columns

- SUBSTITUTE

- Paste values

- SMALL and LARGE

- Charts with two vertical axes

- Transposing data: Both copy and paste as well as using TRANSPOSE (remember CTRL+SHIFT+ENTER)

- TODAY, NOW, and WEEKNUM

- NETWORKDAYS and WORKDAY

- Trace Precedents/dependents

- Delete duplicates

- COUNT and COUNTA

- SUMIFS

- Print area

- Shapes and text: How to insert, formatting, grouping, and aligning

- RAND, RANDBETWEEN, CHOOSE

- Using function to flip a coin or return a random value/string from a list of possibilities.

- Forecasting: How to create a forecast from given data. General interpretation: Forecasted values, upper bound, lower bound, and confidence interval