ASTR 101L: A Brief Introduction to Microsoft Excel

Near the end of the semester, it will become advantageous to use Microsoft Excel to greatly expedite some of the calculations that you will be doing. In short, if you are repeatedly using the same equation(s) for a set of calculations, your life is much easier with the use of a spreadsheet.

1. If you are presented with a table of values (and asked to use those values to calculate other things), you can copy/paste that table directly into Excel. To do so, highlight all of the columns of the table with your mouse, select COPY, and then PASTE into the A1 cell in Excel. If you have done this correctly, the columns from the table will appear as separate columns in Excel.

2. If you want to use a formula in Excel, you may do so with the use of built-in functions and cell references.

   • Built-in functions may be invoked in the formula bar (the big white bar at the top labeled by fx). To find the one that you want, I would recommend either using Google or typing what you think it will be into the formula bar – often times, Excel will know what you’re trying to do and present the correct function if you are in the right ballpark. For instance, the sine function may be called by typing SIN(· · ·), where the “· · ·” is the argument of the sine function (i.e., an angle).

   NOTE: The SIN(· · ·) function in Excel requires an argument in radians. If you have angles measured in degrees, you MUST convert them to radians in either another column or with the use of the RADIANS(· · ·) function.

   • Formulas written in the formula bar must always be preceded by an equals sign (=).

   • Cell references may be used in any formula by replacing variables in an equation with the locations of the values that you wish to use in your spreadsheet. For example, if you have an equation that requires a value located in the A1 cell, you can type A1 into the formula bar – Excel will pull the value from that location and use it in that calculation.

   • Once you have typed a formula into a cell that contains cell references to other columns in the same row, you can copy/paste that formula into subsequent cells in that same column. In doing so, Excel will update the cell references so that you are performing the same calculation (i.e., using the same formula) for each row.

   This is the major time-saving step! You can essentially do as many calculations as you want with the click of a mouse instead of having to do them manually in your calculator.

3. As an example, say you want to calculate the function $f(x, y, z)$ given two numbers $(x, y)$ and an angle $z$ (measured in degrees):

   $$f(x, y, z) = xy \cdot \sin z.$$ 

   If values for $(x, y, z)$ are contained in the columns (A,B,C), then this is the formula that you would type into the D1 cell (after doing so, you would copy/paste the same formula into all of the cells down the D column to repeat the calculation for all values of $(x, y, z)$):

   $fx = (A1)^{(B1)}*\text{SIN(RADIANS}(C1))$

   Good luck!