Instructions for the TMY 3 bin generator

**Summary:**

This tool is an update of the excel bin generator spreadsheet. The spreadsheet, while super convenient, uses the CZ average weather files, and is limited to California as a result. Additionally, these files are not very granular, and average data from large areas into a single file. NREL provided updated TMY 3 weather files for something like 2000 weather stations across the country using data from the 1990s through 2005. These files are available for download from the NREL site, and also stored on our G drive, however, up until now there was no automated method of scheduling, binning and averaging these data sets. This tool does that. Originally the intent was to update the database the excel tool used, however, increasing the number of weather files from 16 to more than 2000 would make a monster excel file, if it were even possible. So, much to everybody’s despair, this tool is an R tool. I tried to make it as user friendly as possible, however it is still not as pretty as the excel tool. What follow are some simple instructions for the tool’s use.

**Capabilities:**

* No download required (beyond the initial tool download), the tool will grab the desired weather file from the NREL website, provided the appropriate USAF station ID code
* Annual summaries for occupied and un-occupied periods, drybulb and wetbulb average temperatures by bin.
  + (wetbulb is calculated from an empirical formula based on relative humidity and drybulb temp. if your site is at high elevation, correction may be necessary)
* User defined bin sizes
* Complex and off hour scheduling (multiple periods with different operating hours / days of operation)
* Can be used to generate single month summaries

**Instructions:**

* Download entire tool folder to the desired file location on your machine (you only need to do this once, so save the folder in a working directory you use for tools of this type!)
* Open R studio, or another R environment, and set your working directory to the directory where the bin tool is saved.
* Open the Schedule.csv file, in excel, and revise to match the schedule of your site.
  + 12 am = the first hour of the day = 1. 11 pm = the 24th hour of the day = 24 (this is the TMY format, I can change it to military, but for now let’s work with the existing format.)
  + (window = 1 is inclusive (hours inside the start and stop times), window = 0 is exclusive (hours outside the start and stop times))
  + The year should remain 2000, this is a default year, the file is comprised of averaged data of about 15 years.
  + Input as many time periods as necessary to capture complex schedules, let the start day of subsequent time periods be the day after the end day of the previous period, the tool starts the period at 1 am on the start date and ends at 11:59 pm on the end date.
  + Save this file as a csv file in the working directory.
  + Re-open the schedule file to ensure excel did not create any extra characters at the end of the file, delete these as necessary
* Open the station USAF codes excel file and select an appropriate station code near your site. This file is the TMY 3 metadata file, it is solely for reference and once you know your code you can close it again.
* Use the Source command in R to run the tool, it will prompt you for the USAF code, and for the bin size of your weather bins. Input these numbers (no spaces or other characters) and press the enter key after each entry.
* The program takes about 30 seconds to run, and outputs the summary to an excel file.
* To generate monthly summaries, run the program with a schedule limited to a single month, and copy the output to another directory. To generate monthly summaries for all 12 months the program will need to be run 12 times, and the output copied 12 times.

**Feedback:**

* If you use the tool, and would like to see it changed or improved in any way, let me know and I will happily attempt requested changes.
* If monthly summaries is a feature we want to make more robust, it can be done, but I almost never use monthly summaries, and I think the use of complex scheduling will resolve this need for most users