Assignment #1 Power Calendar Function

For assignment #1, I need to generate four variables from my function. They are iso(region variable), peaktype(hour identification), period(date range: start to end). I will describe my logic to solve this problem. Before I start, let's understand what is the problem that I need to solve in this project. The objective is to write an R/Python function to return the number of hours by those three parameters.

During the process, I need to consider what factors will impact my results. First, from the first parameter, we need to consider consumption of different regions such us Western Market which takes Saturday as a weekday. Also daylight-saving setting is also a factor identified by region. Second, from the second parameter, they define the different types of hours I need to generate. (flat: the number of total days * 24;onpeak: weekdays *16; offpeak: flat-onpeak; 2x16H: (weekends+holidays)*16;7x8: weeks*8) Third, the period is very important for this assignment. It includes four factors: date type, weekdays, weekends, and holidays.

Inside the function, first, I divide regions into three parts. The first part is MISO since it has no daylight-saving setting. The second part is PJM, ERCOT, SPPISO, and NYISO since they are eastern. And the third part is WECC and CAISO since they are western. When I get input variables in my function, I will identify which region,which peaktype and which date type, then check the weekday, weekend, and NERC holidays. If it is not MISO, I will check if the period includes November and March. For total hours, November should +1 and March should -1. After I finished my function. I need to test it with different types of parameters and compare values with the reference power calendar.

Unfortunately, after I tried 3 times in R and one time in Python, I still generated the incorrect values or codes. Since there is no package for NERC holiday in python. I need to define myself. For the first time in R, I just focused on coding function which ignore the total logic. It made me lost during the process. For my second time in R, I built structure and logic before I type code, but I failed with coding not only hard code(too many "if else"), but also some errors. For my third in R, I only can get daily values with the specific region and also hard coding. For the first time in python, I failed to generate monthly values and holidays.

In general, I discovered my problem is that I am not proficient in R/Python. During the past semester, all of my projects are done by SAS and SQL. I never practiced Python and R in the past year. During this time, I am really grateful that I discovered this problem. I need to spend more time on them during my break before FEB. 2022. And I really appreciate that you give me an opportunity to do this assignment.