

MET 3601 Syntax Problem #8

Please do your work in the syntax-problems folder on the JupyterHub and DON'T forget to also upload both the figure and the .ipynb file to Canvas!

<https://fit25f.ees220002.projects.jetstream-cloud.org/>

Objectives

1. Practice writing and running Python code
2. Use File I/O for input into program

Due by 5:00 p.m. 10/1/2025

Problem

1. Write a Python program that will read the input file KMLB_2025_precip.txt and perform a few tasks. (File is available in the data folder in the JupyterHub and on Canvas). There should be just one figure (call it **kmlb_precip.png**)

For the hours 0000-0200 UTC only:

- a) Create a bar plot of the individual precipitation amounts in the file (i.e., the amount that has fallen in each time interval).
- b) Add a second bar graph of the cumulative precipitation (you can calculate this using the numpy function cumsum).
- c) Add a line graph of the cumulative precipitation to the figure.

Notes:

- Be careful dealing with the “missing” (blank) data for times when there is no precipitation. See `np.nan_to_num(array)` in the `syntax8.ipynb` file.
- Please limit the x axis time interval to one hour (0000-0200 UTC) only. See `ax.set_xlim()` in the `syntax8.ipynb` file.
- You will need to format the x-axis to plot only the hours and minutes of the date-time string (**the day is not needed** – it just clutters up the x-axis!). See

```
fmt = mdates.DateFormatter('%H:%M')
ax.xaxis.set_major_formatter(fmt)
```

in the `syntax8.ipynb` file.