13th Summer School on SCIENTIFIC VISUALIZATION

Matplotib - exercise

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Exercise

Exercise 1 (Matplotlib):

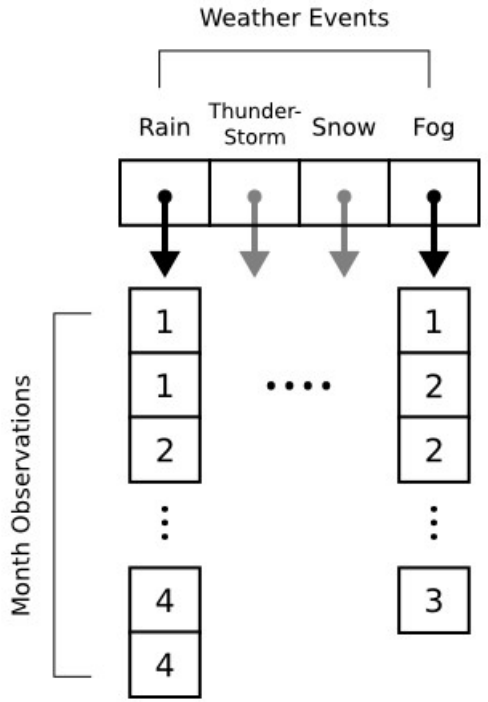
In this exercise we'll plot some weather data read from a .csv file.
Each row rapresents one day, and there are columns for min/mean/max temperature, dew point, wind speed, etc. We'll plot
temperature and weather event data.

- read .csv file with numpy loadtxt function populating a numpy array only with min/max/mean temperature and weather event data.
- plot on the same figure using subplot function, max,min and mean temperature, add axis labels and title
- plot on the same figure using subplot function a trend line for mean/max/min temperature. Use numpy's polyfit function to add a trend line.
- plot on a new figure an event histogram counting occurred events per month as display in figure 2

Exercise

Histograms in matplotlib are generated using the pyplot.hist function.

We'll need to create an array for each type of event. Inside these arrays will be observations like [1, 1, 2, 3, 3] for "January", "January", "February", "March", "March".



Exercise

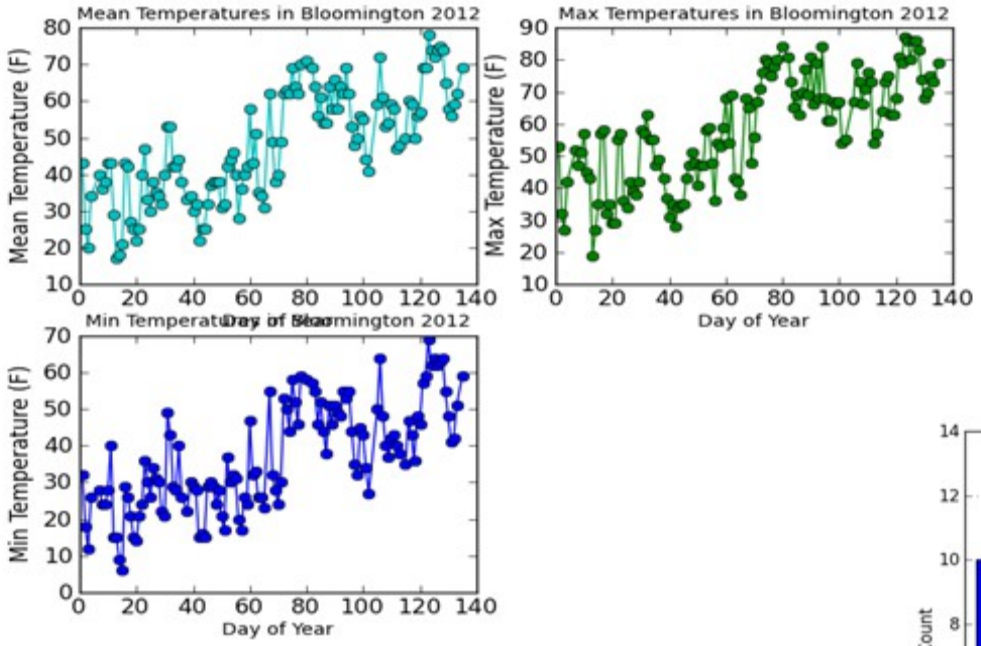


Figure 1

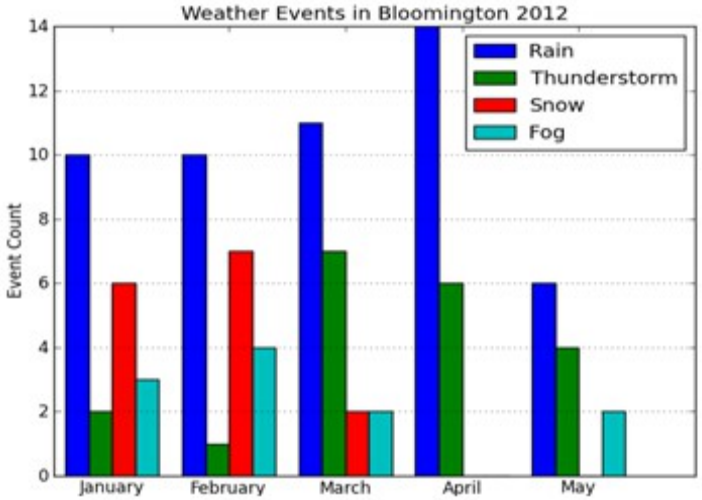


Figure 2

Exercise

Exercise 2 (Mayavi):

In this exercise we display the H2O molecule, and use volume rendering to display the electron localization function.

The atoms and the bounds are displayed using mlab.points3d and mlab.plot3d, with scalar information to control the color.

Read electron localization function from h2o-elf.cube files.
Position of atoms are given by numpy arrays
atoms_x = np.array([2.9, 2.9, 3.8]) * 40 / 5.5
atoms_y = np.array([3.0, 3.0, 3.0]) * 40 / 5.5
atoms_z = np.array([3.8, 2.9, 2.7]) * 40 / 5.5
H1 is in position 0
O is in position 1
H2 is in position 2