# Data Smoothing

Consider the following time series in which $x_i$ = temperature (°F) of effluent at a sewage treatment plant on day $i$:

$$47, 54, 53, 50, 46, 46, 47, 50, 51, 50, 46, 52, 50, 50.$$

1. Plot the data on a two-dimensional coordinate system. Does there appear to be any pattern?

2. Calculate smoothed data using $k$-nearest neighbor with $k = 3$.

3. Calculate smoothed data using exponential smoothing with

   (a) $\alpha = 0.1$ and
   (b) $\alpha = 0.5$.