HW2 (36 points)

The goal of this assignment is to help you gain an understanding of a few smoothing methods. We will use examples 2.11, 2.12 and 2.14 from the textbook. I am attaching my copy of the text book so that we all have the same version.

1) Moving average smoother. (Refer to example 2.11). (5 + 0+ 0+ 0+5 points)
   a. Write the equation of the moving average smoother. Explain the equation in words.
   b. Take k = 2 (choose your any weights appropriately) and implement moving average smoother to the SOI data set.
   c. Repeat a. with k = 6.
   d. Repeat with with k = 10
   e. Plot the original series and the three smoothed series together. Remember to use different colors and a legend to indicate different lines in the plot

2) Kernel smoothing. (example 2.12) . (5 + 3 + 3 + 5 points)
   a. Write the equation for kernel smoother. Explain in words
   b. The textbook uses gaussian kernel. Can you find two other kernels? (google this). Write the formula for the chosen kernels
   c. What is the role of bandwidth in kernel smoothing? (google this)
   d. Use bandwidth of b= 2/12, 4/12, 1, 2 on SOI and plot them all in one graph. Use different colors and a legend to indicate the details

3) Smoothing splines (example 2.14) (5 + 5 points)
   a. Implement smoothing splines on SOI data with spar = 0.5, 1, 2. Also plot them together like in earlier problems.
   b. What is the effect of different values of spar? Why? A rough explanation is adequate