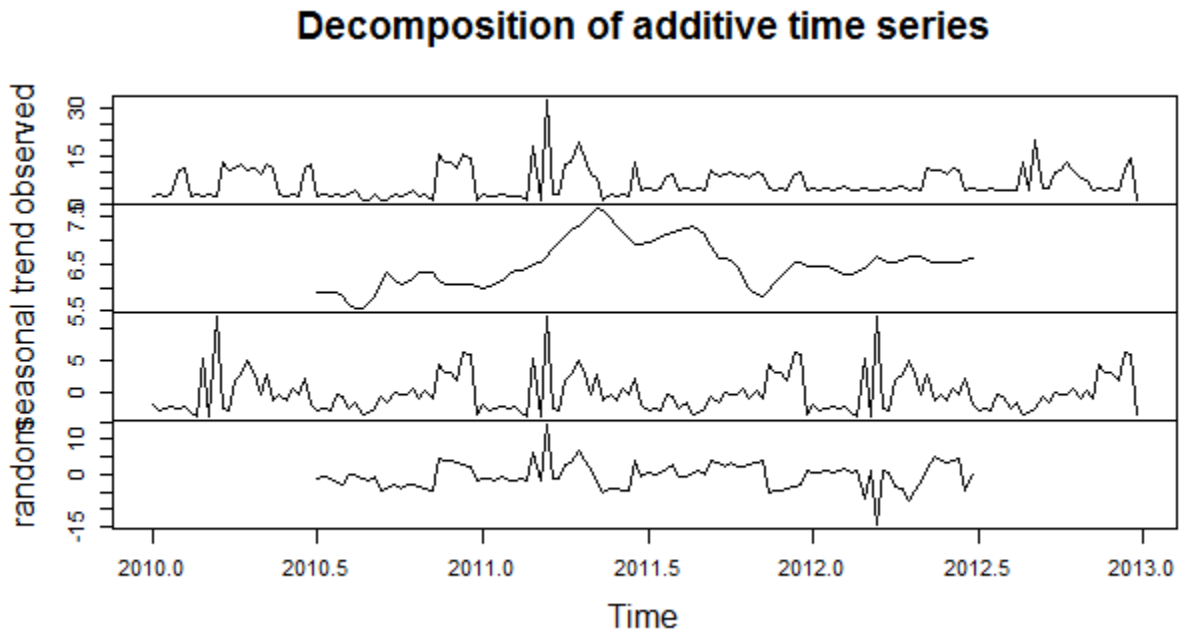
Time Series Analysis

Sales for granola bars , the 3 years given in data are assumed to be spread from 2010-2012.
All the analysis and visualization have been done using R Software.

Case study:

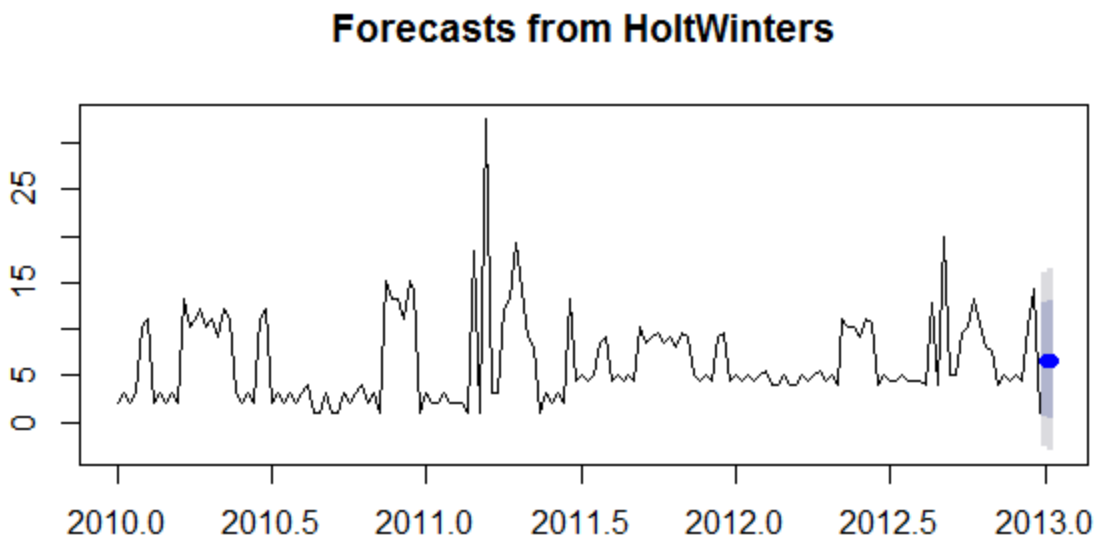
1). What technique(s) would you use to smoothen the spikes

First checking seasonality and checking best fitted seasonal models. If seasonality is found, eliminating the seasonal indices using smoothing, and removing the SSE within the data, decomposing the data and forecasting for next 1 year.



the original time series (top), the estimated trend component (second from top), the estimated seasonal component (third from top), and the estimated irregular component (bottom). We see that the estimated trend component shows a steep increase from about 6 million units in January,2011 to about 7 million units in May,2011, followed by a small decrease till June,2011.

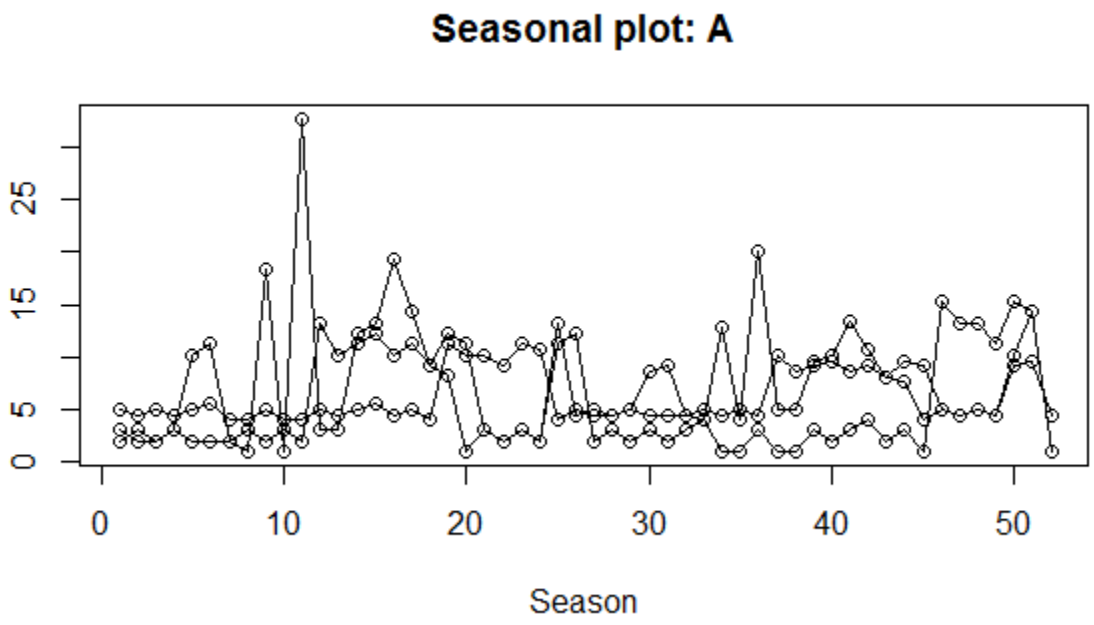
2). What would the demand forecast look like? Please provide us with graphical or numeric output.



Here the forecasts for next 2 years are plotted as a blue line, the 80% prediction interval as a blue shaded area, and the 95% prediction interval as a light blue-shaded area.

3). If Week 1 is the first week of January, do you see any seasonality in the demand? Please elaborate

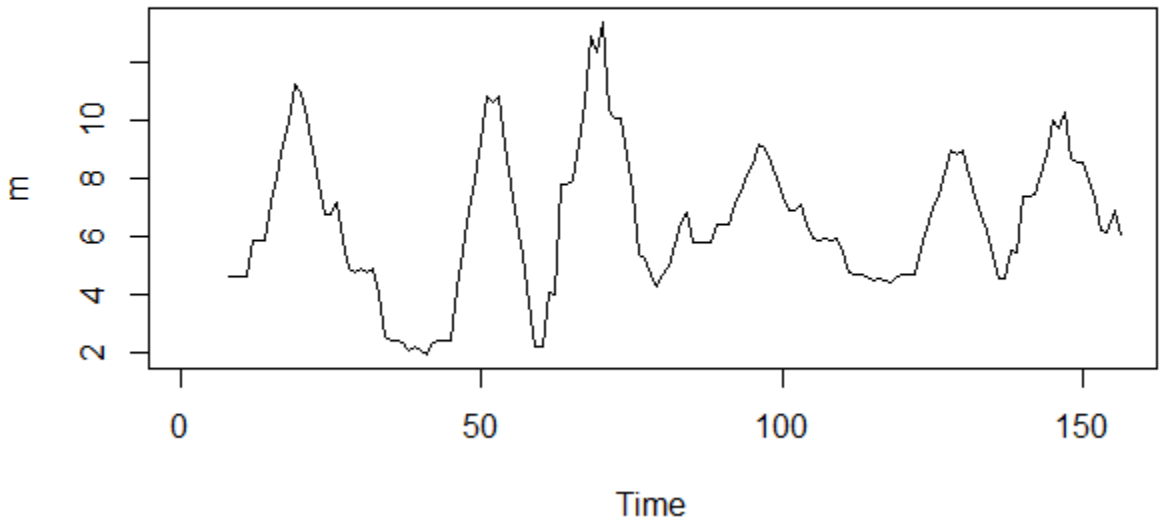
NO. The graph below clearly shows there in no seasonality for demand over 3 years.



The 3 lines that you can see in the above graph are for 3 years 2010(lowest line) and 2012(uppermost line) . Thus, we see there is no periodicity over 3 years, and also none for January sales.

EXTRA REFERENCES:

1) This is the smoothened curve for the sales data using a simple moving average of order 7



2).Holts winter filtering is used to fit a predictive model after eliminating seasonal indices