



IIT ROORKEE



NPTEL ONLINE
CERTIFICATION COURSE

SUPPLY CHAIN ANALYTICS

Tracking Signal and Seasonality Models

DR. RAJAT AGRAWAL
DEPARTMENT OF MANAGEMENT STUDIES
IIT ROORKEE



Ratio Seasonality model

Date	Actual demand	Base	Seasonal Index	Forecast
Jan-16	19.36			
Feb-16	25.45			
Mar-16	19.73			
Apr-16	21.48			
May-16	20.77			
Jun-16	25.42			
Jul-16	23.79			
Aug-16	28.35			
Sep-16	26.8			
Oct-16	25.32			
Nov-16	25.22			
Dec-16	27.14	30		
Jan-17	32.52	31.0448		
Feb-17	31.33	30.9043		
Mar-17	25.32	30.9055		
Apr-17	27.53	30.9013		
May-17	26.38	30.8679		
Jun-17	23.72	30.0273		
Jul-17	29.14			



- Average Demand of 2016 is 24.07
- To deseasonalize the demand of 2016, we need to divide the demand of each month with average demand. E.g in case of January 2016 $19.36 / 24.07 = 0.804$



Date	Actual demand	Base	Seasonal Index	Forecast
Jan-16	19.36		.804	
Feb-16	25.45		1.057	
Mar-16	19.73		0.819	
Apr-16	21.48		0.892	
May-16	20.77		0.863	
Jun-16	25.42		1.056	
Jul-16	23.79		0.988	
Aug-16	28.35		1.178	
Sep-16	26.8		1.113	
Oct-16	25.32		1.052	
Nov-16	25.22		1.048	
Dec-16	27.14	30	1.128	
Jan-17	32.52	31.0448		
Feb-17	31.33	30.9043		
Mar-17	25.32	30.9055		
Apr-17	27.53	30.9013		
May-17	26.38	30.8679		
Jun-17	23.72	30.0273		
Jul-17	29.14			



- The deseasonalized smoothed average, $\bar{S}_t$

$$\bar{S}_t = \alpha \left(\frac{D_t}{I_{t-L}} \right) + (1 - \alpha) \bar{S}_{t-1}$$

Updated Trend will be $I_t = \gamma \left(\frac{D_t}{\bar{S}_t} \right) + (1 - \gamma) I_{t-L}$

Forecast will be $F_{t,1} = \bar{S}_t I_{t-L+1}$



THANK YOU

