Forecasting - II
(Forecasting with Trend and Seasonality)

The Job at Hand!

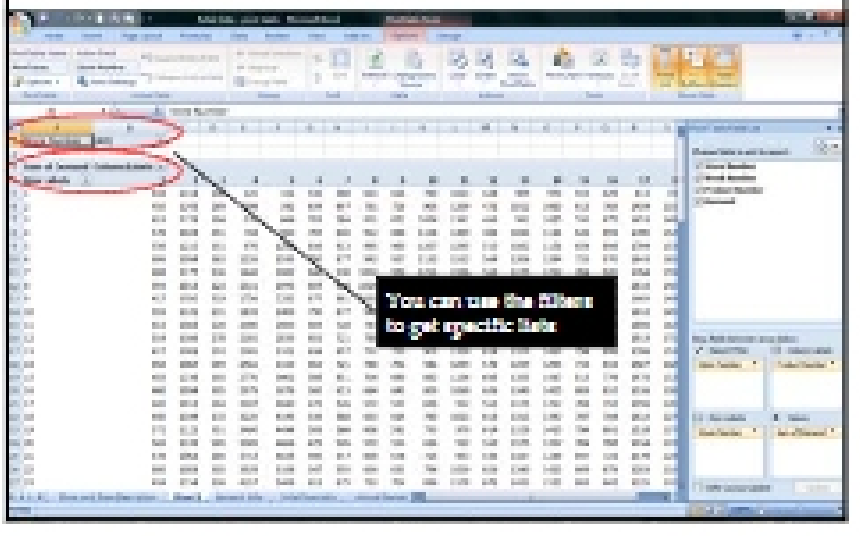
- The top management of Comix Inc was extremely happy with the forecasting model developed by you for Woollen gloves.
- They have been impressed with IDIS productsa!
- They have decided to entrust a new project
  - Forecasting for a particular ice cream box of vanilla flavor for store 1
  - 2 years data has been provided to you
  - Data in the form of a MS Excel file. [name one - "Retail data for forecasting.xls"]
  - We use PIVOT TABLE operation to extract the data

The Job at Hand (Continued)

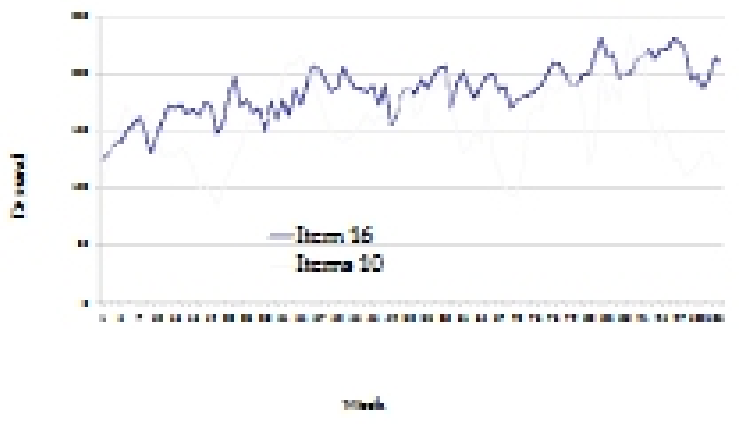
- So can we use the excel sheet we developed for the last product?
  - Understand what we were trying to do for the last product
  - Any forecast model must be based on how the real data "looks" like!
  - No point trying to fit a trend for a product that has steady demand of 10 units every month!

- So how does the Demand data for ice cream look like?
- we use PIVOT TABLE to get the demand data

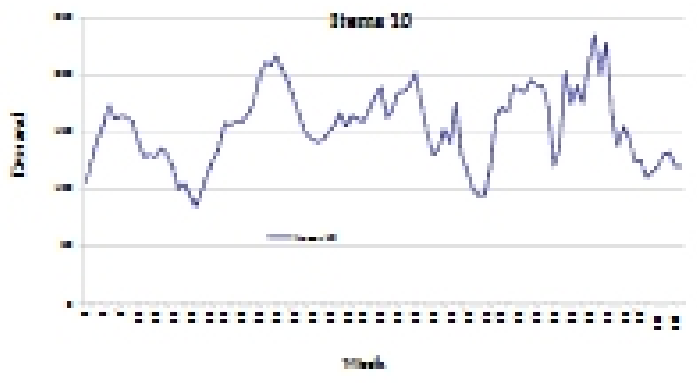
The pivot table is generated



How is it different from seasonal demand?



How does the pattern look?



The job at hand (contd.)

- **Seasons do impact sales!**
- Using a normal model with only Trend may give us results which are far away from the actual
- Reason – We did not choose the right forecasting model
- The suitable model would be one where we could incorporate the seasonal fluctuations in Demand
- How do we include seasonal effects in our forecasting model?

Why are some reasons for periodic fluctuations in demand data

- Seasonal variations
  - Regular upward or downward movements in a time series.
    - Seasonal index (Multiplicative seasonal model)
    - An example (Winter's method)
    - Eg. Demand different in summer and winter seasons
- Cyclical variations
  - Similar to seasonal variations
  - May occur every year or in several years.
  - Real estate prices!!

To include the impact of seasonal effects, we use an normalizing index called the "Seasonality Index"

How do we calculate the Seasonality Index?

Calculate the seasonal index for a time period

Given the demand data for three years 1999,2000 and 2001

You have to calculate the seasonal index for Jan (say)

Step 1 : Average the Jan demand for the three years

Step 2: Average monthly Demand for 3 years

Step 3 : Normalize (Divide Jan Avg by Month Avg)

The value thus obtained is called as the seasonal index S_t