

TREND LINE AND FORECASTING

We can use the least-squares regression line.

Eg Fit a trend line to the Data in the table below. Predict The Number of Schools in 2015.

Year	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
No. of Schools	2149	2140	2124	2118	2114	2091	2064	2059	2038	2029	2013

Walk Through solution on Calculator.

Assign. Time Code 1 as 1981.

$$y = -14.09x + 2169.9.$$

$$\text{Number of Schools} = -14 \times \text{Year} + 2170$$

Number in 2015

2015 - Time Code. 35.

$$\begin{aligned}\text{Number of Schools} &= -14 \times 35 + 2170 \\ &= 1680.\end{aligned}$$

* Forecasting with Seasonality.

We use the deseasonalised data.

Eg Using the deseasonalised Sales data from before.

a) Fit a trend line

b) Predict the sales for Winter of year 4.

$$\text{Winter SI} = 1.30$$

Walk Through on computer.

Year	Summer	Autumn	Winter	Spring
1	893 - 1	943 - 2	955 - 3	858 - 4
2	1005	1026	1043	1040
3	1261	1151	1115	1267.

$$\text{Sales} = 32 \times \text{Quarter} + 838$$

Winter of Year 4 is the 15th Quarter

$$\begin{aligned}\text{Sales} &= 32 \times 15 + 838 \\ &= 1318\end{aligned}$$

This is the DESEASONALISED sales.

$$\text{Deseasonalised} = \frac{\text{Actual}}{\text{SI}}$$

$$1318 = \frac{\text{Actual}}{1.3}$$

$$\begin{aligned}\text{Predicted Actual} &= 1318 \times 1.3 \\ &= 1713\end{aligned}$$

Questions: Exercise 6E on Work Plans.