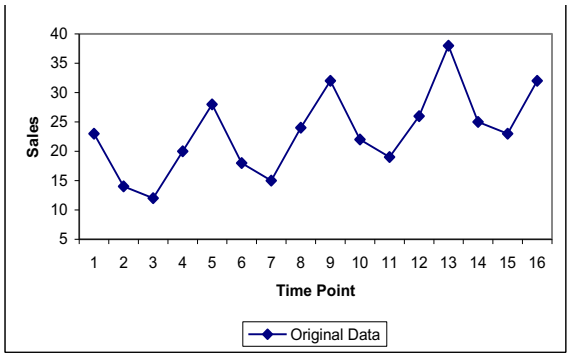
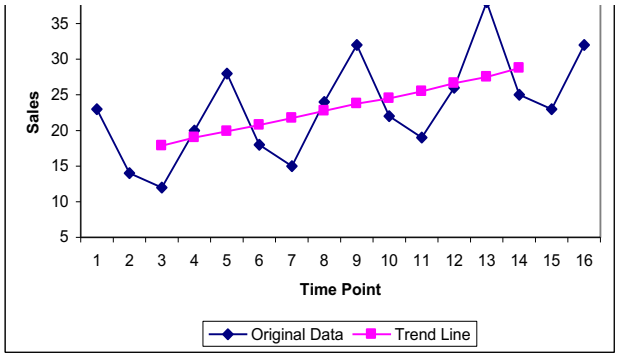
Week 5: Hand Calculations: Solutions





Centred 4pt MA involve two steps - 4pt then 2pt MA's!!

Differences between peak and trend line and trough and trend line fairly constant so use an ADDITIVE model

Year	Quarter	Actual Data Sales	4 Pt MA	Trend Line Centred 4 pt MA	Deviation from Trend	Seasonal Variation	Seasonally Adjusted Data
1	1	23				9	14
1	2	14				-3	17
1	3	12	17.250	17.875	-5.875	-6	18
1	4	20	18.500	19.000	1.000	0	20
2	1	28	19.500	19.875	8.125	9	19
2	2	18	20.250	20.750	-2.750	-3	21
2	3	15	21.250	21.750	-6.750	-6	21
2	4	24	22.250	22.750	1.250	0	24
3	1	32	23.250	23.750	8.250	9	23
3	2	22	24.250	24.500	-2.500	-3	25
3	3	19	24.750	25.500	-6.500	-6	25
3	4	26	26.250	26.625	-0.625	0	26
4	1	38	27.000	27.500	10.500	9	29
4	2	25	28.000	28.750	-3.750	-3	28
4	3	23	29.500			-6	29
4	4	32				0	32

Deviation from Trend = Original data - Trend Line

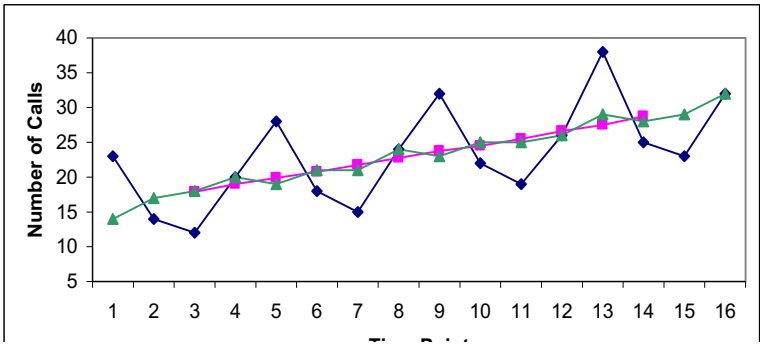
Seasonally Adjusted = Original - Quarterly Variation

(c) Deviation from trend above in table above then Quarterly Seasonal Variation calculated below.

Year	Quarter 1	2	3	4	
1			-5.8750	1.0000	
2	8.1250	-2.7500	-6.7500	1.2500	
3	8.2500	-2.5000	-6.5000	-0.6250	
4	10.5000	-3.7500			
Average	8.9583	-3.0000	-6.3750	0.5417	0.125
Adjustment	0.0313	0.0313	0.0313	0.0313	
Adjusted	8.9271	-3.0313	-6.4063	0.5104	0

Sum of averages should be 0. Adjust by subtracting quarter of the sum from each of the averages.

Quarterly Seasonal Variation	9	-3	-6	0	(rounded to same number of decimal places as the original data)



Slightly increasing trend - sales each quarter increase marginally year by year.

Quarter 1 the maximum each year and quarter 3 the minimum each year.

Residual (random) influences small since trend line and seasonally adjusted data close together.