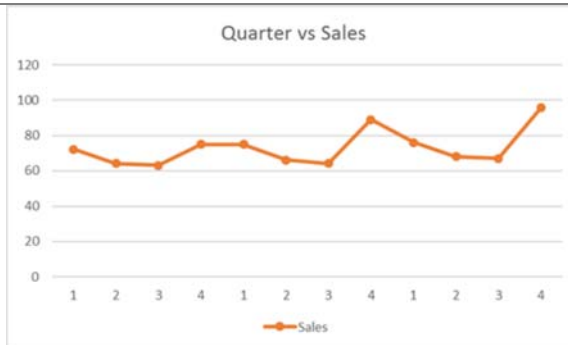


Seasonal Index

Year	Quarter	Sales	t
2003	1	72	1
	2	64	2
	3	63	3
	4	75	4
2004	1	75	5
	2	66	6
	3	64	7
	4	89	8
2005	1	76	9
	2	68	10
	3	67	11
	4	96	12



Rebuilding the original table

Quarter	Year		
	2003	2004	2005
1	72	75	76
2	64	66	68
3	63	64	67
4	75	89	96
Total	274	294	307
Average	68.5	73.5	76.75

1. Calculate the seasonal index for year 2003
 $Average = \frac{72+64+63+75}{4} = 68.5$
 $S.I._{2003.01} = \frac{72}{68.5} = 1.051$ $S.I._{2003.02} = \frac{64}{68.5} = 0.934$ $S.I._{2003.03} = \frac{63}{68.5} = 0.920$ $S.I._{2003.04} = \frac{75}{68.5} = 1.095$
 2. Calculate the seasonal index for year 2004 (same procedure as 2003)
 $Average_{2004} = \frac{75+66+64+89}{4} = 73.5$
 $S.I._{2004.01} = \frac{75}{73.5} = 1.020$ $S.I._{2004.02} = \frac{66}{73.5} = 0.900$ $S.I._{2004.03} = \frac{64}{73.5} = 0.871$ $S.I._{2004.04} = \frac{89}{73.5} = 1.211$
 3. Calculate the seasonal index for year 2005
 $Average_{2005} = \frac{76+68+67+96}{4} = 76.5$
 $S.I._{2005.01} = \frac{76}{76.5} = 0.993$ $S.I._{2005.02} = \frac{68}{76.5} = 0.889$ $S.I._{2005.03} = \frac{67}{76.5} = 0.876$ $S.I._{2005.04} = \frac{96}{76.5} = 1.242$
 4. Calculate the overall seasonal index
 $S.I._{01} = Average(S.I._{2003.01}, S.I._{2004.01}, S.I._{2005.01}) = \frac{1.051+1.020+0.993}{3} = 1.021$
 $S.I._{02} = Average(S.I._{2003.02}, S.I._{2004.02}, S.I._{2005.02}) = \frac{0.934+0.900+0.889}{3} = 0.907$
 $S.I._{03} = Average(S.I._{2003.03}, S.I._{2004.03}, S.I._{2005.03}) = \frac{0.920+0.871+0.876}{3} = 0.889$
 $S.I._{04} = Average(S.I._{2003.04}, S.I._{2004.04}, S.I._{2005.04}) = \frac{1.095+1.211+1.242}{3} = 1.183$
 5. Verification
 Since our data spans 4 columns, Quarter 1, Quarter 2, Quarter 3 and Quarter 4, therefore $S.I._{01} + S.I._{02} + S.I._{03} + S.I._{04}$ should be 4.
 $Sum(S.I._{01}, S.I._{02}, S.I._{03}, S.I._{04}) = 1.021 + 0.907 + 0.889 + 1.183 = 4$

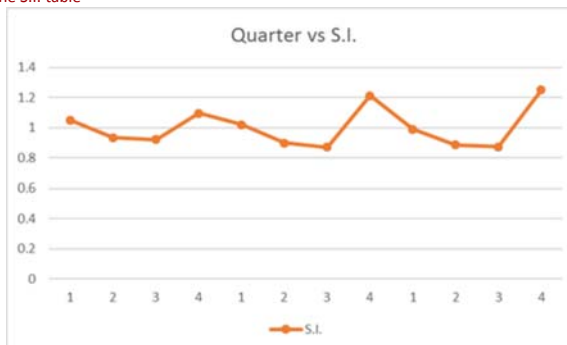
Calculate the Overall S.I.

Quarter	Year			Overall S.I.
	2003	2004	2005	
1	1.051095	1.020408	0.990228	1.020577
2	0.934307	0.897959	0.885993	0.906086
3	0.919708	0.870748	0.872964	0.887807
4	1.094891	1.210884	1.250814	1.18553
Total	4	4	4	4
Average				

Reference: Forecasting Methods made simple - Seasonal Indices <https://www.youtube.com/watch?v=nXweMii7Q8Q>

Rebuilding the S.I. table

Year	Quarter	S.I.	t
2003	1	1.051095	1
	2	0.934307	2
	3	0.919708	3
	4	1.094891	4
2004	1	1.020408	5
	2	0.897959	6
	3	0.870748	7
	4	1.210884	8
2005	1	0.990228	9
	2	0.885993	10
	3	0.872964	11



Calculate the Deseasonalized Sales

Quarter	Year		
	2003	2004	2005
1	70.54833	73.48784	74.46768
2	70.63344	72.84073	75.04803
3	70.96138	72.08775	75.46687
4	63.26286	75.07193	80.97646

Total
Average

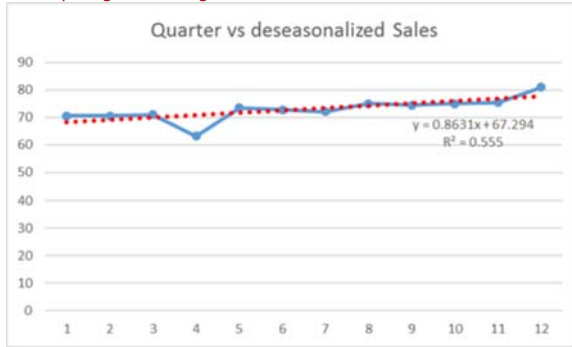
★ $\text{Deseasonalized Value} = \frac{\text{Actual Value}}{\text{Seasonal Index}}$

Deseasonalised Table:

Year	Quarter 1	Quarter 2	Quarter 3	Quarter 4
2003	$\frac{70.54833}{1.01} = 70$	$\frac{73.48784}{1.01} = 73$	71	63
2004	$\frac{70.63344}{1.01} = 70$	$\frac{72.84073}{1.01} = 73$	72	75
2005	$\frac{70.96138}{1.01} = 70$	$\frac{75.07193}{1.01} = 75$	75	80

Rebuilding the Deseasonalized Sales table and plotting the trendling

Year	Quarter	Deseason t
2003	1	70.54833
2003	2	70.63344
2003	3	70.96138
2003	4	63.26286
2004	1	73.48784
2004	2	72.84073
2004	3	72.08775
2004	4	75.07193
2005	1	74.46768
2005	2	75.04803
2005	3	75.46687
2005	4	80.97646



Reference: How to Add a Trendline in Excel <https://www.youtube.com/watch?v=svFSKnmAIKQ>