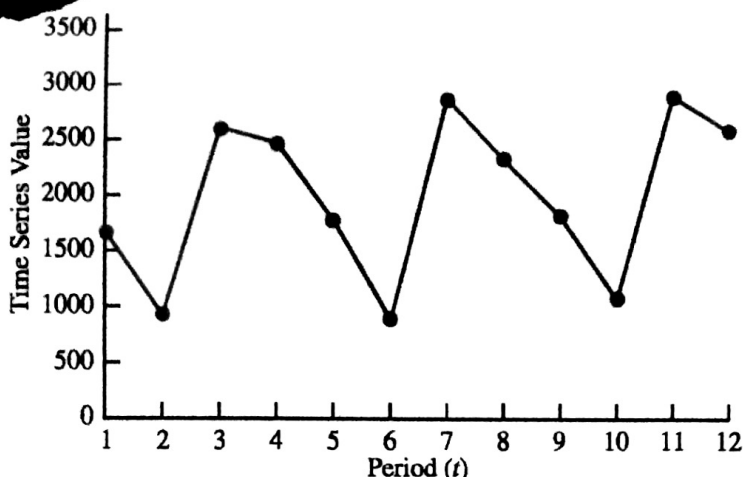


26. a.



There appears to be a seasonal pattern in the data and perhaps a moderate upward linear trend.

b. After putting the data into the following format:

Dummy Variables

Year	Quarter	Quarter 1	Quarter 2	Quarter 3	Y_t
1	1	1	0	0	1690
1	2	0	1	0	940
1	3	0	0	1	2625
1	4	0	0	0	2500
2	1	1	0	0	1800
2	2	0	1	0	900
2	3	0	0	1	2900
2	4	0	0	0	2360
3	1	1	0	0	1850
3	2	0	1	0	1100
3	3	0	0	1	2930
3	4	0	0	0	2615

we can use the LINEST function to find the regression model:

$$\text{Value} = 2491.67 - 711.67 \text{ Qtr1} - 1511.67 \text{ Qtr2} + 326.67 \text{ Qtr3}$$

c. The quarterly forecasts for next year are as follows:

$$\text{Quarter 1 forecast} = 2491.67 - 711.67(1) - 1511.67(0) + 326.67(0) = 1780.00$$

$$\text{Quarter 2 forecast} = 2491.67 - 711.67(0) - 1511.67(1) + 326.67(0) = 980.00$$

$$\text{Quarter 3 forecast} = 2491.67 - 711.67(0) - 1511.67(0) + 326.67(1) = 2818.33$$

$$\text{Quarter 4 forecast} = 2491.67 - 711.67(0) - 1511.67(0) + 326.67(0) = 2491.67$$

d. After putting the data into the following format:

Dummy Variables

Year	Quarter	Quarter 1	Quarter 2	Quarter 3	t	Y_t
1	1	1	0	0	1	1690
1	2	0	1	0	2	940
1	3	0	0	1	3	2625
1	4	0	0	0	4	2500
2	1	1	0	0	5	1800
2	2	0	1	0	6	900
2	3	0	0	1	7	2900
2	4	0	0	0	8	2360
3	1	1	0	0	9	1850
3	2	0	1	0	10	1100
3	3	0	0	1	11	2930
3	4	0	0	0	12	2615

we can use the LINEST function to find the regression model:

$$\text{Value} = 2306.67 - 642.29 \text{ Qtr1} - 1465.42 \text{ Qtr2} + 349.79 \text{ Qtr3} + 23.13t$$

The quarterly forecasts for next year are as follows:

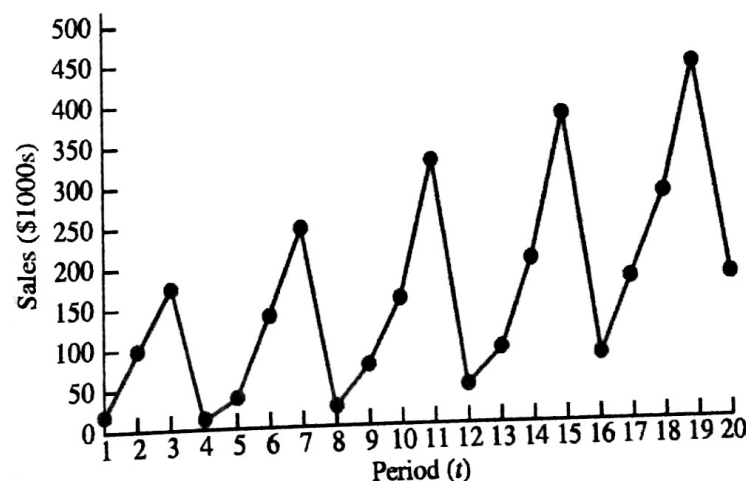
$$\text{Quarter 1 forecast} = 2306.67 - 642.29(1) - 1465.42(0) + 349.79(0) + 23.13(13) = 1965.00$$

$$\text{Quarter 2 forecast} = 2306.67 - 642.29(0) - 1465.42(1) + 349.79(0) + 23.13(14) = 1165.00$$

$$\text{Quarter 3 forecast} = 2306.67 - 642.29(0) - 1465.42(0) + 349.79(1) + 23.13(15) = 2011.33$$

$$\text{Quarter 4 forecast} = 2306.67 - 642.29(0) - 1465.42(0) + 349.79(0) + 23.13(16) = 2676.67$$

28. a.



The time series plot shows both a linear trend and seasonal effects.