

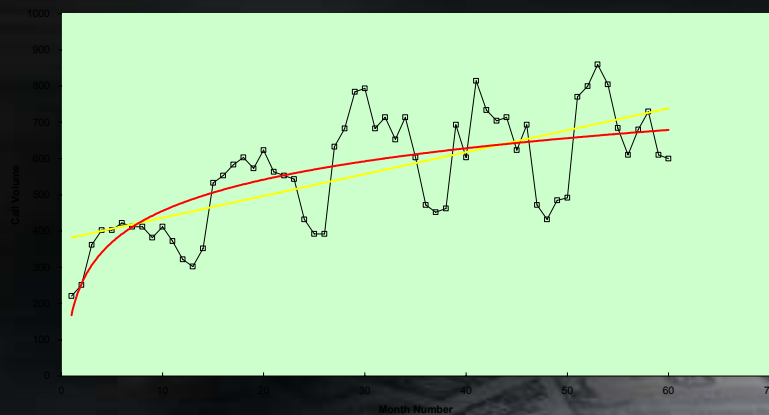
EMC 445 EMS SYSTEMS MANAGEMENT

Forecasting II: Forecasting Seasonal Call Demand

EMC 445: Forecasting Seasonal Call Demand 1

Forecasting Seasonal Call Demand

Graph of Monthly Call Volume

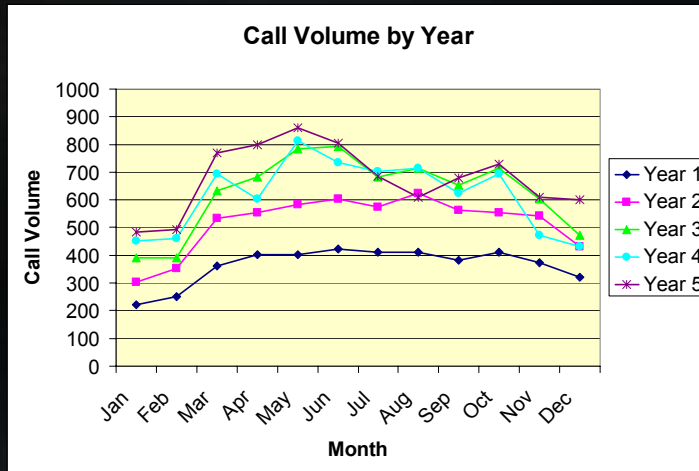


EMC 445: Forecasting Seasonal Call Demand

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Forecasting Seasonal Call Demand continued

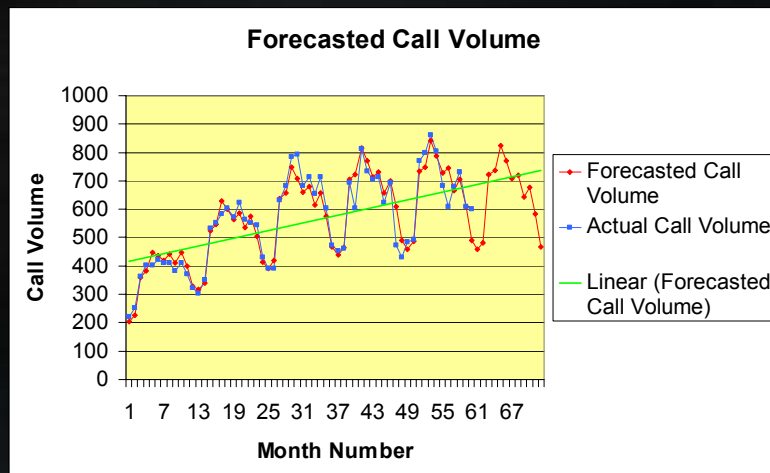


EMC 445: Forecasting Seasonal Call Demand

3



Forecasting Seasonal Call Demand continued



EMC 445: Forecasting Seasonal Call Demand

4





Forecasting Seasonal Call Demand continued

Microsoft Excel - forecasting seasonality

File Edit View Insert Format Tools Data Window Help

H12

1	A	B	C	D	E	F	G
2	ENTER MONTHLY CALL VOLUME DATA HERE						
3							
4							
5	Month	Year 1	Year 2	Year 3	Year 4	Year 5	
6							
7	Jan	221	302	392	452	485	
8	Feb	251	352	392	462	492	
9	Mar	362	533	633	693	770	
10	Apr	402	553	683	603	800	
11	May	402	583	784	814	860	
12	Jun	422	603	794	734	805	
13	Jul	412	573	683	704	684	
14	Aug	412	623	714	714	610	
15	Sep	382	563	653	623	680	
16	Oct	412	553	714	693	730	
17	Nov	372	543	603	472	610	
18	Dec	322	432	472	432	600	
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37							

Ready

Navigation: Data Entry Sheet | Seasonal Indices Sheet | Deseasonalizing Data Sheet | Regression

EMC 445: Forecasting Seasonal Call Demand

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Forecasting Seasonal Call Demand continued

Microsoft Excel - forecasting seasonality (version 1) [Recovered]

File Edit View Insert Format Tools Data Window Help

H12

1	A	B	C	D	E	F	G
2	ENTER MONTHLY CALL VOLUME DATA HERE						
3							
4							
5	Month	Year 1	Year 2	Year 3	Year 4	Year 5	
6							
7	Jan	221	302	392	452	485	
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Ready

Navigation: Data Entry Sheet | Seasonal Indices Sheet | Deseasonalizing Data Sheet | Regression

EMC 445: Forecasting Seasonal Call Demand

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Forecasting Seasonal Call Demand continued

Microsoft Excel - forecasting seasonality (version 1)

Table 3 Adjusting unadjusted seasonal index

Month	Unadjusted indices	X	Adjusting constant	=	Seasonal index
			Total of Indices/1200		
Jan	70.29		1.0160412		71.42
Feb	74.09		1.0160412		75.28
Mar	111.59		1.0160412		113.38
Apr	113.77		1.0160412		115.60
May	127.97		1.0160412		130.02
Jun	119.98		1.0160412		121.90
Jul	110.93		1.0160412		112.71
Aug	113.18		1.0160412		114.99
Sep	101.57		1.0160412		103.19
Oct	107.49		1.0160412		109.22
Nov	93.21		1.0160412		94.71
Dec	75.19		1.0160412		76.40

Table 4. Monthly Seasonal Indices

Month	Month Number	Seasonal Index
Jan	1	71.42
Feb	2	75.28
Mar	3	113.38
Apr	4	115.60
May	5	130.02
Jun	6	121.90
Jul	7	112.71
Aug	8	114.99
Sep	9	103.19
Oct	10	109.22
Nov	11	94.71
Dec	12	76.40

EMC 445: Forecasting Seasonal Call Demand

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Forecasting Seasonal Call Demand continued

Microsoft Excel - forecasting seasonality (version 1)

Table 5. Deseasonalizing the data

year	month	month number	volume	seasonal index	(5)/(6)	Deseasonalized volume (4)/(5)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Year 1	Jan	1	221	71.42	0.714192	309.44
	Feb	2	251	75.28	0.752771	333.43
	Mar	3	362	113.38	1.133766	319.29
	Apr	4	402	115.60	1.155983	347.76
	May	5	402	130.02	1.30018	309.19
	Jun	6	422	121.90	1.219005	346.18
	Jul	7	412	112.71	1.127085	365.54
	Aug	8	412	114.99	1.149946	358.28
	Sep	9	382	103.19	1.031944	370.18
	Oct	10	412	109.22	1.092169	377.23
	Nov	11	372	94.71	0.947072	392.79
	Dec	12	322	76.40	0.763964	421.49
Year 2	Jan	13	302	71.42	0.714192	422.86
	Feb	14	352	75.28	0.752771	467.61
	Mar	15	533	113.38	1.133766	470.11
	Apr	16	553	115.60	1.155983	478.38
	May	17	583	130.02	1.30018	448.40
	Jun	18	603	121.90	1.219005	494.67
	Jul	19	573	112.71	1.127085	508.39
	Aug	20	623	114.99	1.149946	541.76
	Sep	21	563	103.19	1.031944	545.57
	Oct	22	553	109.22	1.092169	506.33
	Nov	23	543	94.71	0.947072	573.35
	Dec	24	432	76.40	0.763964	565.47
Year 3	Jan	25	392	71.42	0.714192	548.87
	Feb	26	392	75.28	0.752771	520.74
	Mar	27	633	113.38	1.133766	558.32
	Apr	28	683	115.60	1.155983	590.84
	May	29	784	130.02	1.30018	602.99
	Jun	30	794	121.90	1.219005	651.35
	Jul	31	683	112.71	1.127085	605.99

EMC 445: Forecasting Seasonal Call Demand

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Forecasting Seasonal Call Demand continued

Microsoft Excel - forecasting seasonality (version 1)

Enter Exponent for Dummy Variable Here: 1.7

Year	Month	Month Number	Dummy Variable	De-seasonalized Volume	Forecasted De-seasonal Volume	Re-seasonalized Forecasted Volume
Year 1	Jan	1	1.00	309.44	285.83	204.14
	Feb	2	3.25	333.43	301.45	226.92
	Mar	3	6.47	319.29	316.47	358.80
	Apr	4	10.56	247.76	330.97	302.59
	May	5	15.43	309.19	344.98	448.53
	Jun	6	21.03	246.10	359.54	437.06
	Jul	7	27.33	365.54	371.68	418.91
	Aug	8	34.30	258.28	384.40	442.04
	Sep	9	41.90	370.18	396.74	409.41
	Oct	10	50.12	377.23	408.70	446.37
	Nov	11	58.93	392.79	420.29	398.05
	Dec	12	68.33	421.49	431.53	329.67
Year 2	Jan	13	78.29	422.86	442.42	315.98
	Feb	14	88.80	467.61	452.98	340.99
	Mar	15	99.85	470.11	463.20	525.16
	Apr	16	111.43	478.38	473.10	546.90
	May	17	123.53	448.40	482.69	627.58
	Jun	18	136.13	494.67	491.96	599.70
	Jul	19	149.24	508.39	500.92	564.58
	Aug	20	162.84	641.76	509.58	585.99
	Sep	21	176.92	545.57	517.95	534.49
	Oct	22	191.48	506.33	526.02	574.50
	Nov	23	206.51	573.35	533.80	505.55
	Dec	24	222.00	565.47	541.30	412.54
Year 3	Jan	25	237.96	548.87	548.52	391.75
	Feb	26	254.36	520.74	555.46	418.14
	Mar	27	271.22	558.32	562.13	637.32
	Apr	28	288.53	530.84	568.29	679.81

SUMMARY OUTPUT

Regression Statistics

Multiple R	0.930823
R Square	0.866431
Adjusted R Square	0.861731
Observations	50

ANOVA

	df	SS	MS
Regression	2	696246.7	348123.4
Residual	57	107642.1	1888.450
Total	59	803888.8	

Coefficients and Std. Error

Intercept	15.4418	18.51524	14.55272
Variable 1	16.95728	1.745051	9.735074
Variable 2	-0.61193	0.094448	-6.48392

EMC 445: Forecasting Seasonal Call Demand

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Forecasting Seasonal Call Demand continued

Microsoft Excel - forecasting seasonality (version 1)

File Edit View Insert Format Tools Data Window Help

Type a question for help

Counter

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	A	B	C	D	E	F	G	H	I	J	K
46	Year 4	Dec	36	442.30	617.83	610.24	466.20				
47		Jan	37	463.39	632.89	614.31	438.74				
48		Feb	38	484.88	613.73	618.13	465.31				
49		Mar	39	506.77	611.24	621.71	704.80				
50		Apr	40	529.06	621.63	625.05	722.55				
51		May	41	551.74	626.07	628.14	816.70				
52		Jun	42	574.81	602.13	631.00	769.19				
53		Jul	43	598.27	604.62	633.62	714.14				
54		Aug	44	622.11	620.90	636.00	731.36				
55		Sep	45	646.34	603.71	638.14	658.53				
56		Oct	46	670.95	604.52	640.06	699.05				
57		Nov	47	695.93	498.28	641.74	607.78				
58		Dec	48	721.29	565.47	643.19	491.38				
59	Year 5	Jan	49	747.02	679.09	644.42	460.24				
60		Feb	50	773.12	653.58	645.42	485.85				
61		Mar	51	799.59	679.15	646.19	732.63				
62		Apr	52	826.43	692.05	646.74	747.62				
63		May	53	853.63	661.45	647.05	841.30				
64		Jun	54	881.19	660.27	647.17	788.90				
65		Jul	55	909.11	606.88	647.05	729.28				
66		Aug	56	937.39	530.46	646.71	743.68				
67		Sep	57	966.02	658.95	646.16	666.80				
68		Oct	58	995.01	668.39	645.39	704.87				
69		Nov	59	1024.35	644.09	644.40	610.29				
70		Dec	60	1054.04	785.38	643.20	471.38				
71	Year 6	Jan	61	1084.08		641.78	458.26				
72		Feb	62	1114.46		640.16	481.89				
73		Mar	63	1145.19		638.32	723.70				
74		Apr	64	1176.27		636.27	735.51				
75		May	65	1207.68		634.01	824.32				
76		Jun	66	1239.44		631.54	769.85				
77		Jul	67	1271.53		628.87	708.78				
78		Aug	68	1303.96		625.98	719.05				
79		Sep	69	1336.73		623.90	642.79				
80		Oct	70	1369.83		619.60	676.71				
81		Nov	71	1403.26		616.11	583.50				
82		Dec	72	1437.03		612.41	467.86				

File Edit View Insert Format Tools Data Window Help

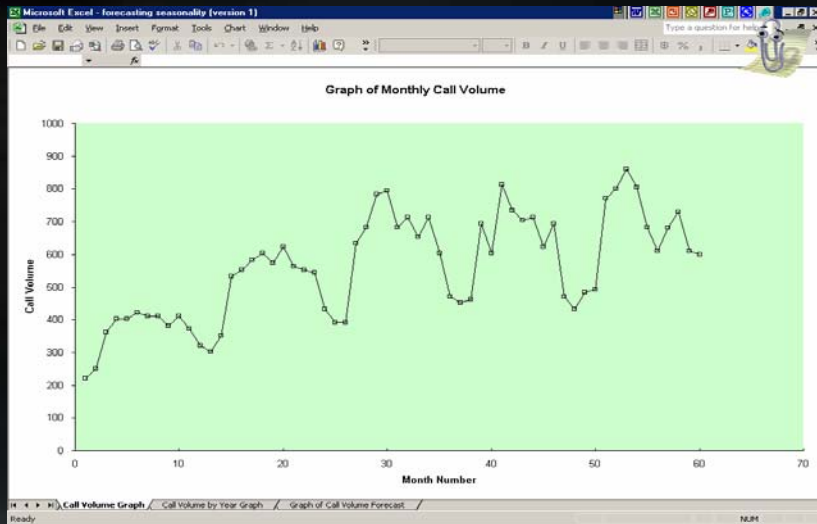
Data Entry Sheet Seasonal Indices Sheet De-seasonalizing Data Sheet Regression Sheet

EMC 445: Forecasting Seasonal Call Demand

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Forecasting Seasonal Call Demand continued

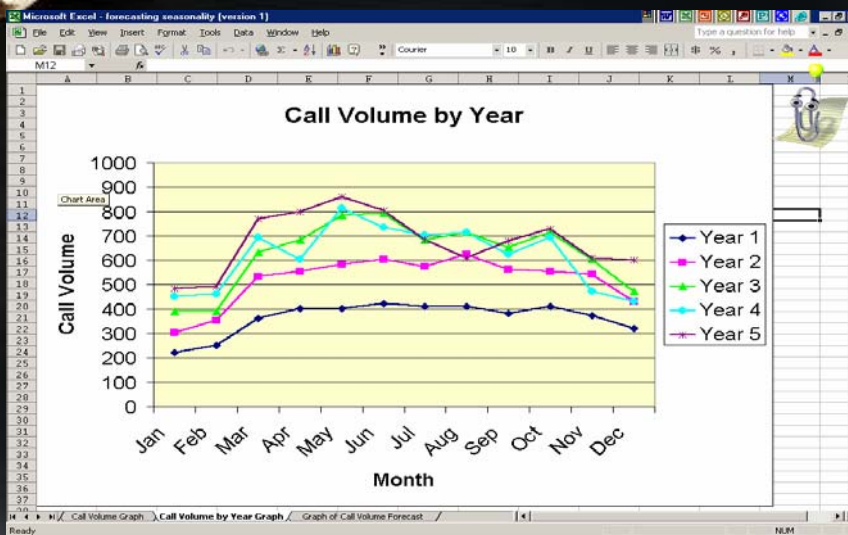


EMC 445: Forecasting Seasonal Call Demand

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Forecasting Seasonal Call Demand continued

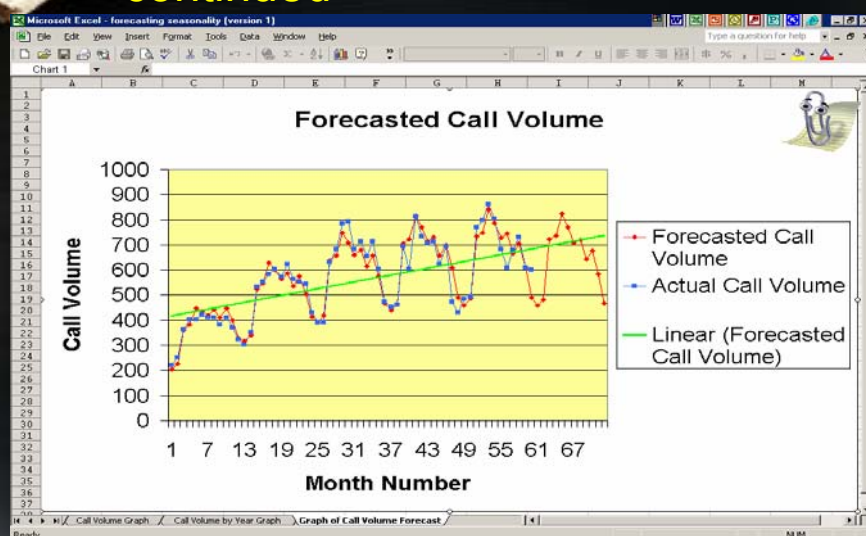


EMC 445: Forecasting Seasonal Call Demand

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Forecasting Seasonal Call Demand continued



EMC 445: Forecasting Seasonal Call Demand

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Forecasting Seasonal Call Demand continued

- Forecasting Assignment
 - Enter data into DATA ENTRY SHEET
 - Go to REGRESSION SHEET
 - Enter value for exponent for dummy variable in the blue box
 - Run the regression
 - Cell I-4 must be the output cell
 - Review accuracy of regression statistically and graphically
 - Repeat regression until you are satisfied with accuracy.
 - Forecasted call volume for year 6 is in the yellow area at the bottom of the REGRESSION SHEET

EMC 445: Forecasting Seasonal Call Demand

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