

Forecasting Questions

4. In a time-series forecasting problem, if the seasonal indices for quarters 1, 2, and 3 are .80, .90, and .95 respectively, what can you say about the seasonal index for quarter 4?
- A) It will be less than 1.
 - B) It will be greater than 1.
 - C) It will be equal to 1.
 - D) Seasonality does not exist.
 - E) There is insufficient data to say anything.
5. If actual sales are 120 units and the seasonal index is 1.2, then the deseasonalized sales are (Note that this question is *not* related to the previous test question):
- A) 100.0
 - B) 118.8
 - C) 121.2
 - D) 132.9
 - E) 144.0
6. Which of the following statements is true?
- A) BIAS tells you the magnitude of error, while MAD tells you the direction.
 - B) BIAS and MAD are always equal.
 - C) MAD can never be negative.
 - D) MAD can never be greater than the Bias.
 - E) MAD is always less than the Bias
7. The simple moving average is well suited to forecasting demand that is stable with no trend or seasonal pattern.
- A) True
 - B) False
9. One advantage of the moving average is that it reacts quickly to trends and seasonal effects.
- A) True
 - B) False
11. If there is no seasonal variation in quarterly data, the seasonal factors of the seasonally adjusted forecast will all be equal to 0.25.
- A) True
 - B) False
12. A negative correlation coefficient indicates a weaker relationship between X and Y than a positive correlation coefficient.
- A) True
 - B) False

Directions for Problems 13-17: Sam Piper is trying to forecast sales for his store, Sam's Sporting Supermart. Sam's first try was with Simple Exponential Smoothing, using $\alpha = 0.75$. Unfortunately, his dog chewed his worksheet. Please help him by filling in the missing cells (see cells with question marks) with correct values, or correct Excel formulas.

	A	B	C	D	E	F
1	Year	Quarter	Enroll- ment	Forecast	Error	Abs Error
2	1997	1	313	313		
3		2	285	313	?	
4		3	312	292	20	20
5		4	339	307	32	32
6	1998	1	359	331	28	28
7		2	320	?		
8		3	356	328	28	28
9		4	385	349	36	?
10	1999	1	396	376	20	20
11		2	367	?		
12		3	397	373	24	24
13		4	423	391	32	32
14	2000	1		415		
15				Bias =	?	
16	Alpha =	0.75			MAD =	

13. Find the forecast for 1998 Q2 (cell D7).

- A) $=(C6*B16)+(D6*B16)$
- B) $=(C6*B16)+(D6*(1-B16))$
- C) $=(C7*B16)+(D6*(1-C16))$
- D) $=(C7*B16)-(D6*(1-C16))$
- E) $=(C7*C16)+(E6*C16)$

14. Find the Error for 1997 Q2 (cell E3).

- A) 0
- B) 6
- C) -6
- D) 28
- E) -28

15. Find the Absolute Error for 1998 Q4 (cell F9).

- A) -35
- B) 0
- C) 20
- D) 28
- E) 36

16. Find the Bias (cell E15).

- A) $=AVERAGE(E2:E13)$
- B) $=AVERAGE(E3:E14)$
- C) $=AVERAGE(E3:E13)$
- D) $=SUM(E2:E13)$
- E) $=SUM(E3:E14)$

17. If Sam had used a Naïve forecast, what would his forecast for Q1, 2000 have been?

- A) 391
- B) 403
- C) 410
- D) 415
- E) 423

20. The Delphi method attempts to arrive at a consensus opinion from a group of experts.

- A) True
- B) False

32. Exponential Smoothing with $\alpha = 0.125$ and a Simple Moving Average with $n = 8$ put the same weight on the actual value of y in the current period.

- A) True
- B) False

from	to	Qtr	Raw Data	Seasonal Indexes	Deseas. Data	Linear Model	Re-Seas. Model	Abs. Error	% Error	Sq. Err.			
Jan-05	Mar-05	1	107.8	80.48%	133.943	109.913	88.460	19.34	19.34	18%	374.03		
Apr-05	Jun-05	2	104.0	85.54%	121.585	114.587	98.014	5.99	5.99	6%	35.83		
Jul-05	Sep-05	3	111.9	83.35%	134.259	119.262	99.400	12.50	12.50	11%	156.25		
Oct-05	Dec-05	4	189.2	150.64%	125.602	123.936	186.691	2.51	2.51	1%	6.29		
Jan-06	Mar-06	5	99.8	80.48%	124.003	128.611	103.509	-3.71	3.71	4%	13.75		
Apr-06	Jun-06	6	132.7	85.54%	155.138	133.285	114.007	18.69	18.69	14%	349.41		
Jul-06	Sep-06	7	103.5	83.35%	124.181	137.959	114.984	-11.48	11.48	11%	131.88		
Oct-06	Dec-06	8	175.5	150.64%	116.507	142.634	214.857	-39.36	39.36	22%	1548.94		
Jan-07	Mar-07	9	114.5	80.48%	142.268	147.308	118.557	-4.06	4.06	4%	16.46		
Apr-07	Jun-07	10	114.7	85.54%	134.095	151.983	130.001	-15.30	15.30	13%	234.12		
Jul-07	Sep-07	11	114.1	83.35%	136.899	156.657	130.568	-16.47	16.47	14%	271.19		
Oct-07	Dec-07	12	215.5	150.64%	143.061	161.332	243.022	-27.52	27.52	13%	757.46		
Jan-08	Mar-08	13	134.7	80.48%	167.366	166.006	133.605	1.09	1.09	1%	1.20		
Apr-08	Jun-08	14	131.4	85.54%	153.619	170.681	145.994	-14.59	14.59	11%	212.99		
Jul-08	Sep-08	15	126.8	83.35%	152.136	175.355	146.152	-19.35	19.35	15%	374.50		
Oct-08	Dec-08	16	284.5	150.64%	188.867	180.029	271.187	13.31	13.31	5%	177.22		
Jan-09	Mar-09	17	164.2	80.48%	204.020	184.704	148.654	15.55	15.55	9%	241.69		
Apr-09	Jun-09	18	177.2	85.54%	207.163	189.378	161.988	15.21	15.21	9%	231.41		
Jul-09	Sep-09	19	186.8	83.35%	224.125	194.053	161.736	25.06	25.06	13%	628.21		
Oct-09	Dec-09	20	297.6	150.64%	197.564	198.727	299.353	-1.75	1.75	1%	3.07		
Jan-10	Mar-10	21		80.48%		203.402	163.702						
Apr-10	Jun-10	22		85.54%		208.076	177.981						
						slpoe =	4.674			Bias	MAD	MAPE	MSE
						intercept =	105.238			-1.22	14.14	10%	288.30

32.1. According to the forecasting model for Rocky Gold's quarterly sales of jewelry above, about how many thousand dollars worth of jewelry would you expect to sell in the current quarter, April 1 to June 30 2010?

- A. 100
- B. 200
- C. 300
- D. 400
- E. 500

For problems 32.2 and 32.3: use the following output from the Excel regression system.

Note the Excel regression system uses a mixture of geometric ("Intercept") and algebraic ("Coefficients") language to express a regression model, and gives some extra information about the significance.

SUMMARY OUTPUT

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	228.7811	132.7356	1.7236	0.0892	-35.9515	493.5138
Housing Starts	0.0982	0.0016	59.9311	6.78E-62	0.0949	0.1014

Consider the regression output above that forecasts sales of foundation blocks (in \$ thousand) in a particular company based on using building permits as a leading indicator.

32.2. Given the data in the table above, what is the regression equation?

- a. Block Sales = $(228.7811 * \text{Intercept}) + (0.0982 * \text{building permits})$
- b. Block Sales = $228.7811 + (0.0982 * \text{building permits})$
- c. Block Sales = $(228.7811) * (0.0982 * \text{building permits})$
- d. Block Sales = $0.0982 + (228.7811 * \text{building permits})$
- e. None of the above

32.3. Interpret the coefficient 0.0982 for building permits. It means that

- a. Block Sales for every person in the sample is \$98.20.
- b. For every unit increase of building permits, next month's Block Sales goes up on average by \$98.20.
- c. For every month of building permits, the previous month's Block Sales is multiplied by \$98.20.
- d. For every month of building permits, the previous month's Block Sales is increased by \$98.20.
- e. None of the above