Exponential Smoothing Forecast

Single exponential smoothing forecast for the next period from a series of up to eight observations, with the mean absolute deviation and the bias of past forecasts.

Method: Single exponential smoothing

Input parameters

Unit system: SI

Parameter	Value	Unit
Initial forecast	120.00	
Smoothing constant	30.000	%
Number of observations (1–8)	6.0000	
Observation 1	128.00	
Observation 2	117.00	
Observation 3	135.00	
Observation 4	142.00	
Observation 5	131.00	
Observation 6	149.00	
Observation 7	0	
Observation 8	0	

Calculated results

Parameter	Value	Unit
Forecast for the next period	135.97	
Mean absolute deviation	10.675	
Mean error (bias, actual − forecast)	8.8749	
Tracking signal (Σe/MAD)	4.9883	

Notes for this case

• Each new forecast moves part of the way toward the latest observation: F_{t+1} = F_t + α(D_t − F_t) = αD_t + (1 − α)F_t. Small α (0.1–0.3) smooths noise; large α reacts quickly but chases noise. MAD measures accuracy; a tracking signal beyond about ±4 shows bias (for example an unmodelled trend, which needs Holt's method).

Formula and method

$$F_{t+1} = \alpha D_t + (1-\alpha)F_t, \quad MAD = \frac{1}{n}\sum |D_t - F_t|$$

Variables

F_1	Initial forecast	-
α	Smoothing constant	-
n	Number of observations (1–8)	-
D_1	Observation 1	-
D_2	Observation 2	-
D_3	Observation 3	-
D_4	Observation 4	-
D_5	Observation 5	-

D_6	Observation 6	-
D_7	Observation 7	-
D_8	Observation 8	-
F_{n+1}	Forecast for the next period	-
MAD	Mean absolute deviation	-
$\bar{e}$	Mean error (bias, actual − forecast)	-
TS	Tracking signal (Σe/MAD)	-

Method and standards

Exponential smoothing.

Assumptions and limits

- Level series without trend or seasonality.

References

Single exponential smoothing

Report details

Report reference	FCC-F1QJ-N6GP (the same inputs always give the same reference)
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Release checks	3 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/general/geometry/exponential-smoothing-forecast

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.