

```
502 0 OUTPUT ACTIVATE ForecastAccuracyMetricsOutput.  
502 0 M> OUTPUT ACTIVATE ForecastAccuracyMetricsOutput.  
503 0 TITLE 'Forecast Accuracy Metrics'.  
503 0 M> TITLE 'Forecast Accuracy Metrics'.
```

Forecast Accuracy Metrics

```
504 0 GET DATA /TYPE=TXT /FILE='D:\DATA ANALYSIS\N Time Series Tests and Fo
recasting\Forecast Accuracy Metrics\dataset.csv' /ENCODING='UTF8' /DELCASE=LINE /DELIMITERS=',' /QUALIFIER='"' /ARRANGEMENT=DELIMITED /FIRSTCASE=2
504 0 M> GET DATA /TYPE=TXT /FILE='D:\DATA ANALYSIS\N Time Series Tests and
Forecasting\Forecast Accuracy Metrics\dataset.csv' /ENCODING='UTF8' /DELCASE=LINE /DELIMITERS=',' /QUALIFIER='"' /ARRANGEMENT=DELIMITED /FIRSTCASE=2
505 0 /VARIABLES=school A8 sex A8 age F8.0 address A8 famsize A8 Pstatus A
8 Medu F8.0 Fedu F8.0 Mjob A16 Fjob A16 reason A16 guardian A16 traveltime F8.0 studytime F8.0 failures F8.0 schoolsup A
8 famsup A8 paid A8 activities A8 nursery A8 higher A8 internet A8 romantic A8 famrel F8.0 freetime F8.0 goout F8.0 Dalc
F8.0 Walc F8.0 health F8.0 absences F8.0 G1 F8.0 G2 F8.0 G3 F8.0.
505 0 M> /VARIABLES=school A8 sex A8 age F8.0 address A8 famsize A8 Pstatu
s A8 Medu F8.0 Fedu F8.0 Mjob A16 Fjob A16 reason A16 guardian A16 traveltime F8.0 studytime F8.0 failures F8.0 schoo
lsup A8 famsup A8 paid A8 activities A8 nursery A8 higher A8 internet A8 romantic A8 famrel F8.0 freetime F8.0 goout
F8.0 Dalc F8.0 Walc F8.0 health F8.0 absences F8.0 G1 F8.0 G2 F8.0 G3 F8.0.
506 0 DATASET NAME ForecastAccuracyMetricsData.
506 0 M> DATASET NAME ForecastAccuracyMetricsData.
507 0 COMPUTE time_index=$CASENUM.
507 0 M> COMPUTE time_index=$CASENUM.
508 0 EXECUTE.
508 0 M> EXECUTE.
509 0 * BEGIN METHOD-SPECIFIC SPSS WORKFLOW.
509 0 M> * BEGIN METHOD-SPECIFIC SPSS WORKFLOW.
510 0 COMPUTE naive=LAG(G3).
510 0 M> COMPUTE naive=LAG(G3).
511 0 COMPUTE error=G3-naive.
511 0 M> COMPUTE error=G3-naive.
512 0 COMPUTE ae=ABS(error).
512 0 M> COMPUTE ae=ABS(error).
513 0 COMPUTE se=error**2.
513 0 M> COMPUTE se=error**2.
514 0 IF(G3<>0) ape=100*ABS(error/G3).
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Forecast Accuracy Metrics

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514 0 M> IF(G3<>0) ape=100*ABS(error/G3).
515 0 COMPUTE smape=200*ABS(error)/(ABS(G3)+ABS(naive)).
515 0 M> COMPUTE smape=200*ABS(error)/(ABS(G3)+ABS(naive)).
516 0 DESCRIPTIVES VARIABLES=ae se ape smape /STATISTICS=MEAN STDDEV MIN MA
X.
516 0 M> DESCRIPTIVES VARIABLES=ae se ape smape /STATISTICS=MEAN STDDEV MIN
MAX.

```

Descriptives

Notes

Output Created		18-JUL-2026 15:52:18
Comments		
Input	Data	D:\DATA ANALYSIS\N Time Series Tests and Forecasting\Forecast Accuracy Metrics\dataset. csv
	Active Dataset	ForecastAccuracyMetrics Data
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	649
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	All non-missing data are used.
Syntax		DESCRIPTIVES VARIABLES=ae se ape smape /STATISTICS=MEAN STDDEV MIN MAX.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.29

[ForecastAccuracyMetricsData]

Forecast Accuracy Metrics

Warnings

A division by zero has been attempted on the indicated command. The result has been set to the system-missing value.

>Command line: 515 Current case: 641 Current splitfile group: 1

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ae	648	.00	19.00	2.9630	2.85321
se	648	.00	361.00	16.9074	37.21682
ape	633	.00	1000.00	25.1688	44.85363
smape	647	.00	200.00	29.1816	40.66244
Valid N (listwise)	633				

```
517 0 * END METHOD-SPECIFIC SPSS WORKFLOW.
517 0 M> * END METHOD-SPECIFIC SPSS WORKFLOW.
518 0 SAVE OUTFILE='D:\DATA ANALYSIS\N Time Series Tests and Forecasting\Fo
recast Accuracy Metrics\SPSS_Output\sav\forecast-accur
acy-metrics_spss_ready_data.sav' /COMPRESSED.
518 0 M> SAVE OUTFILE='D:\DATA ANALYSIS\N Time Series Tests and Forecasting
\Forecast Accuracy Metrics\SPSS_Output\sav\forecast-ac
curacy-metrics_spss_ready_data.sav' /COMPRESSED.
519 0 ECHO 'Forecast Accuracy Metrics'.
519 0 M> ECHO 'Forecast Accuracy Metrics'.
Forecast Accuracy Metrics
520 0 ECHO 'Method type: forecast_evaluation'.
520 0 M> ECHO 'Method type: forecast_evaluation'.
Method type: forecast_evaluation
521 0 ECHO 'Design: One-step naive forecast evaluated with MAE, RMSE, MAPE,
sMAPE, and MASE.'.
521 0 M> ECHO 'Design: One-step naive forecast evaluated with MAE, RMSE, MA
PE, sMAPE, and MASE.'.
Design: One-step naive forecast evaluated with MAE, RMSE, MAPE, sMAPE, and MAS
E.
522 0 ECHO 'Formula: e_t=y_t-y_(t-1); metrics summarize |e_t|, e_t^2, and s
caled/percentage errors'.
```

Forecast Accuracy Metrics

```
522 0 M> ECHO 'Formula: e_t=y_t-y_(t-1); metrics summarize |e_t|, e_t^2, and
scaled/percentage errors'.
Formula: e_t=y_t-y_(t-1); metrics summarize |e_t|, e_t^2, and scaled/percentage
errors
523 0 ECHO 'Series order: source-row order'.
523 0 M> ECHO 'Series order: source-row order'.
Series order: source-row order
524 0 ECHO 'mae = 2.962962962962963'.
524 0 M> ECHO 'mae = 2.962962962962963'.
mae = 2.962962962962963
525 0 ECHO 'rmse = 4.111861793325185'.
525 0 M> ECHO 'rmse = 4.111861793325185'.
rmse = 4.111861793325185
526 0 ECHO 'mape_nonzero_actuals = 25.168795456952253'.
526 0 M> ECHO 'mape_nonzero_actuals = 25.168795456952253'.
mape_nonzero_actuals = 25.168795456952253
527 0 ECHO 'smape = 29.13660562327679'.
527 0 M> ECHO 'smape = 29.13660562327679'.
smape = 29.13660562327679
528 0 ECHO 'mase = 1.0'.
528 0 M> ECHO 'mase = 1.0'.
mase = 1.0
529 0 ECHO 'evaluated_forecasts = 648'.
529 0 M> ECHO 'evaluated_forecasts = 648'.
evaluated_forecasts = 648
530 0 ECHO 'zero_actuals_excluded_from_mape = 15'.
530 0 M> ECHO 'zero_actuals_excluded_from_mape = 15'.
zero_actuals_excluded_from_mape = 15
531 0 ECHO 'Cross-check status: pass'.
531 0 M> ECHO 'Cross-check status: pass'.
Cross-check status: pass
532 0 OUTPUT SAVE OUTFILE='D:\DATA ANALYSIS\N Time Series Tests and Forecasting\Forecast Accuracy Metrics\SPSS_Output\spv\forecast-accuracy-metrics_spss_output.spv'.
532 0 M> OUTPUT SAVE OUTFILE='D:\DATA ANALYSIS\N Time Series Tests and Forecasting\Forecast Accuracy Metrics\SPSS_Output\spv\forecast-accuracy-metrics_spss_output.spv'.
533 0 OUTPUT EXPORT /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=PRINTSETTING /PDF DOCUMENTFILE='D:\DATA ANALYSIS\N Time S
```

Forecast Accuracy Metrics

Series Tests and Forecasting\Forecast Accuracy Metrics\SPSS_Output\
pdf\forecast-accuracy-metrics_spss_output.pdf'.

533 0 M> OUTPUT EXPORT /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=
PRINTSETTING /PDF DOCUMENTFILE='D:\DATA ANALYSIS\N Tim

e Series Tests and Forecasting\Forecast Accuracy Metrics\SPSS_0
utput\pdf\forecast-accuracy-metrics_spss_output.pdf'.