

```
653 0 OUTPUT ACTIVATE HoltsLinearTrendMethodOutput.  
653 0 M> OUTPUT ACTIVATE HoltsLinearTrendMethodOutput.  
654 0 TITLE 'Holts Linear Trend Method'.  
654 0 M> TITLE 'Holts Linear Trend Method'.
```

Holts Linear Trend Method

```
655 0 GET DATA /TYPE=TXT /FILE='D:\DATA ANALYSIS\N Time Series Tests and Fo
recasting\Holts Linear Trend Method\dataset.csv' /ENCO
      DING='UTF8' /DELCASE=LINE /DELIMITERS=', ' /QUALIFIER='"' /ARRANGEM
ENT=DELIMITED /FIRSTCASE=2
655 0 M> GET DATA /TYPE=TXT /FILE='D:\DATA ANALYSIS\N Time Series Tests and
Forecasting\Holts Linear Trend Method\dataset.csv' /E
      NCODING='UTF8' /DELCASE=LINE /DELIMITERS=', ' /QUALIFIER='"' /AR
RANGEMENT=DELIMITED /FIRSTCASE=2
656 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 gua
      rdian 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 F
      8.0 G3 F8.0.
656 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 hig
      her 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.
657 0 DATASET NAME HoltsLinearTrendMethodData.
657 0 M> DATASET NAME HoltsLinearTrendMethodData.
658 0 COMPUTE time_index=$CASENUM.
658 0 M> COMPUTE time_index=$CASENUM.
659 0 EXECUTE.
659 0 M> EXECUTE.
660 0 * BEGIN METHOD-SPECIFIC SPSS WORKFLOW.
660 0 M> * BEGIN METHOD-SPECIFIC SPSS WORKFLOW.
661 0 COMPUTE level=.30*G3+.70*(LAG(G3)+(LAG(G3)-LAG(G3,2))).
661 0 M> COMPUTE level=.30*G3+.70*(LAG(G3)+(LAG(G3)-LAG(G3,2))).
662 0 COMPUTE level_change=level-LAG(level).
662 0 M> COMPUTE level_change=level-LAG(level).
663 0 COMPUTE trend=.10*level_change+.90*LAG(level_change).
663 0 M> COMPUTE trend=.10*level_change+.90*LAG(level_change).
664 0 COMPUTE holt_fit=LAG(level)+LAG(trend).
664 0 M> COMPUTE holt_fit=LAG(level)+LAG(trend).
665 0 COMPUTE holt_error=G3-holt_fit.
```

Holts Linear Trend Method

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665  0 M>  COMPUTE holt_error=G3-holt_fit.
666  0  DESCRIPTIVES VARIABLES=level trend holt_fit holt_error /STATISTICS=ME
AN STDDEV MIN MAX.
666  0 M>  DESCRIPTIVES VARIABLES=level trend holt_fit holt_error /STATISTICS
=MEAN STDDEV MIN MAX.

```

Descriptives

Notes

Output Created		18-JUL-2026 15:52:42
Comments		
Input	Data	D:\DATA ANALYSIS\N Time Series Tests and Forecasting\Holts Linear Trend Method\dataset.csv
	Active Dataset	HoltsLinearTrendMethodData
	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=level trend holt_fit holt_error /STATISTICS=MEAN STDDEV MIN MAX.
Resources	Processor Time	00:00:00.03
	Elapsed Time	00:00:00.06

[HoltsLinearTrendMethodData]

Holts Linear Trend Method

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
level	647	-11.20	28.80	11.9077	4.82696
trend	645	-28.67	25.66	-.0100	6.13796
holt_fit	644	-24.17	41.76	11.9160	7.58881
holt_error	644	-31.76	35.17	-.0123	7.80070
Valid N (listwise)	644				

```

667 0 * END METHOD-SPECIFIC SPSS WORKFLOW.
667 0 M> * END METHOD-SPECIFIC SPSS WORKFLOW.
668 0 SAVE OUTFILE='D:\DATA ANALYSIS\N Time Series Tests and Forecasting\Holts Linear Trend Method\SPSS_Output\sav\holts-linear-trend-method_spss_ready_data.sav' /COMPRESSED.
668 0 M> SAVE OUTFILE='D:\DATA ANALYSIS\N Time Series Tests and Forecasting\Holts Linear Trend Method\SPSS_Output\sav\holts-linear-trend-method_spss_ready_data.sav' /COMPRESSED.
669 0 ECHO 'Holts Linear Trend Method'.
669 0 M> ECHO 'Holts Linear Trend Method'.
Holts Linear Trend Method
670 0 ECHO 'Method type: trend_forecasting_model'.
670 0 M> ECHO 'Method type: trend_forecasting_model'.
Method type: trend_forecasting_model
671 0 ECHO 'Design: Holt additive linear-trend method without seasonality, evaluated on the final 10 percent.'.
671 0 M> ECHO 'Design: Holt additive linear-trend method without seasonality, evaluated on the final 10 percent.'.
Design: Holt additive linear-trend method without seasonality, evaluated on the final 10 percent.
672 0 ECHO 'Formula:  $l_t = \alpha y_t + (1 - \alpha)(l_{t-1} + b_{t-1})$ ;  $b_t = \beta(l_t - l_{t-1}) + (1 - \beta)b_{t-1}$ '.
672 0 M> ECHO 'Formula:  $l_t = \alpha y_t + (1 - \alpha)(l_{t-1} + b_{t-1})$ ;  $b_t = \beta(l_t - l_{t-1}) + (1 - \beta)b_{t-1}$ '.
Formula:  $l_t = \alpha y_t + (1 - \alpha)(l_{t-1} + b_{t-1})$ ;  $b_t = \beta(l_t - l_{t-1}) + (1 - \beta)b_{t-1}$ 
673 0 ECHO 'Series order: source-row order'.
673 0 M> ECHO 'Series order: source-row order'.
Series order: source-row order
674 0 ECHO 'alpha = 0.11049210171461453'.

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Holts Linear Trend Method

```
674  0 M> ECHO 'alpha = 0.11049210171461453'.
alpha = 0.11049210171461453
675  0 ECHO 'beta = 0.0'.
675  0 M> ECHO 'beta = 0.0'.
beta = 0.0
676  0 ECHO 'initial_level = 12.81433261037715'.
676  0 M> ECHO 'initial_level = 12.81433261037715'.
initial_level = 12.81433261037715
677  0 ECHO 'initial_trend = -0.007709668582256191'.
677  0 M> ECHO 'initial_trend = -0.007709668582256191'.
initial_trend = -0.007709668582256191
678  0 ECHO 'holdout_mae = 5.067040750972593'.
678  0 M> ECHO 'holdout_mae = 5.067040750972593'.
holdout_mae = 5.067040750972593
679  0 ECHO 'holdout_rmse = 5.901783943863519'.
679  0 M> ECHO 'holdout_rmse = 5.901783943863519'.
holdout_rmse = 5.901783943863519
680  0 ECHO 'forecast_horizon = 64'.
680  0 M> ECHO 'forecast_horizon = 64'.
forecast_horizon = 64
681  0 ECHO 'Cross-check status: pass'.
681  0 M> ECHO 'Cross-check status: pass'.
Cross-check status: pass
682  0 OUTPUT SAVE OUTFILE='D:\DATA ANALYSIS\N Time Series Tests and Forecas
ting\Holts Linear Trend Method\SPSS_Output\spv\holts-l
inear-trend-method_spss_output.spv'.
682  0 M> OUTPUT SAVE OUTFILE='D:\DATA ANALYSIS\N Time Series Tests and Fore
casting\Holts Linear Trend Method\SPSS_Output\spv\holt
s-linear-trend-method_spss_output.spv'.
683  0 OUTPUT EXPORT /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=PRI
NTSETTING /PDF DOCUMENTFILE='D:\DATA ANALYSIS\N Time S
eries Tests and Forecasting\Holts Linear Trend Method\SPSS_Output\
pdf\holts-linear-trend-method_spss_output.pdf'.
683  0 M> OUTPUT EXPORT /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=
PRINTSETTING /PDF DOCUMENTFILE='D:\DATA ANALYSIS\N Tim
e Series Tests and Forecasting\Holts Linear Trend Method\SPSS_O
utput\pdf\holts-linear-trend-method_spss_output.pdf'.
```