

```
1029 0 OUTPUT ACTIVATE SARIMAModelOutput.  
1029 0 M> OUTPUT ACTIVATE SARIMAModelOutput.  
1030 0 TITLE 'SARIMA Model'.  
1030 0 M> TITLE 'SARIMA Model'.
```

SARIMAModel

```
1031 0 GET DATA /TYPE=TXT /FILE='D:\DATA ANALYSIS\N Time Series Tests and Fo
recasting\SARIMA Model\dataset.csv' /ENCODING='UTF8' /
      DELCASE=LINE /DELIMITERS=', ' /QUALIFIER='"' /ARRANGEMENT=DELIMITED
      /FIRSTCASE=2
1031 0 M> GET DATA /TYPE=TXT /FILE='D:\DATA ANALYSIS\N Time Series Tests and
Forecasting\SARIMA Model\dataset.csv' /ENCODING='UTF8
      ' /DELCASE=LINE /DELIMITERS=', ' /QUALIFIER='"' /ARRANGEMENT=DEL
IMITED /FIRSTCASE=2
1032 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.
1032 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.
1033 0 DATASET NAME SARIMAModelData.
1033 0 M> DATASET NAME SARIMAModelData.
1034 0 COMPUTE time_index=$CASENUM.
1034 0 M> COMPUTE time_index=$CASENUM.
1035 0 EXECUTE.
1035 0 M> EXECUTE.
1036 0 * BEGIN METHOD-SPECIFIC SPSS WORKFLOW.
1036 0 M> * BEGIN METHOD-SPECIFIC SPSS WORKFLOW.
1037 0 COMPUTE g3_l1=LAG(G3,1).
1037 0 M> COMPUTE g3_l1=LAG(G3,1).
1038 0 EXECUTE.
1038 0 M> EXECUTE.
1039 0 COMPUTE g3_s12=LAG(G3,12).
1039 0 M> COMPUTE g3_s12=LAG(G3,12).
1040 0 COMPUTE g3_s13=LAG(G3,13).
1040 0 M> COMPUTE g3_s13=LAG(G3,13).
```

SARIMAModel

```

1041  0  REGRESSION /STATISTICS=COEFF OUTS R ANOVA CI(95) /DEPENDENT G3 /METHO
D=ENTER time_index g3_l1 g3_s12 g3_s13 /SAVE PRED(sari
      ma_fit) RESID(sarima_resid).
1041  0  M> REGRESSION /STATISTICS=COEFF OUTS R ANOVA CI(95) /DEPENDENT G3 /ME
THOD=ENTER time_index g3_l1 g3_s12 g3_s13 /SAVE PRED(s
      arima_fit) RESID(sarima_resid).

```

Regression

Notes

Output Created		18-JUL-2026 15:53:48
Comments		
Input	Data	D:\DATA ANALYSIS\N Time Series Tests and Forecasting\SARIMA Model\dataset.csv
	Active Dataset	SARIMAModelData
	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	Statistics are based on cases with no missing values for any variable used.
Syntax		REGRESSION /STATISTICS=COEFF OUTS R ANOVA CI(95) /DEPENDENT G3 /METHOD=ENTER time_index g3_l1 g3_s12 g3_s13 /SAVE PRED (sarima_fit) RESID (sarima_resid).
Resources	Processor Time	00:00:00.11
	Elapsed Time	00:00:00.23

SARIMAModel

Notes

	Memory Required	5552 bytes
	Additional Memory Required for Residual Plots	0 bytes
Variables Created or Modified	sarima_fit	Unstandardized Predicted Value
	sarima_resid	Unstandardized Residual

[SARIMAModelData]

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	g3_s13, g3_l1, time_index, g3_s12 ^b	.	Enter

a. Dependent Variable: G3

b. All requested variables entered.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.250 ^a	.063	.057	3.160

a. Predictors: (Constant), g3_s13, g3_l1, time_index, g3_s12

b. Dependent Variable: G3

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	420.008	4	105.002	10.518	.000 ^b
	Residual	6299.382	631	9.983		
	Total	6719.390	635			

a. Dependent Variable: G3

b. Predictors: (Constant), g3_s13, g3_l1, time_index, g3_s12

SARIMAModel

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.544	.833		11.455	.000
	time_index	-.002	.001	-.128	-3.213	.001
	g3_l1	.156	.040	.156	3.935	.000
	g3_s12	.018	.042	.017	.428	.669
	g3_s13	.086	.041	.082	2.068	.039

Coefficients^a

Model		95.0% Confidence Interval for B	
		Lower Bound	Upper Bound
1	(Constant)	7.907	11.180
	time_index	-.004	-.001
	g3_l1	.078	.234
	g3_s12	-.064	.100
	g3_s13	.004	.167

a. Dependent Variable: G3

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	8.87	13.67	11.88	.813	636
Residual	-12.657	8.310	.000	3.150	636
Std. Predicted Value	-3.702	2.203	.000	1.000	636
Std. Residual	-4.006	2.630	.000	.997	636

a. Dependent Variable: G3

```

1042 0 * END METHOD-SPECIFIC SPSS WORKFLOW.
1042 0 M> * END METHOD-SPECIFIC SPSS WORKFLOW.
1043 0 SAVE OUTFILE='D:\DATA ANALYSIS\N Time Series Tests and Forecasting\SARIMA Model\SPSS_Output\sav\sarima-model_spss_ready_data.sav' /COMPRESSED.

```

SARIMAModel

```
1043  0 M> SAVE OUTFILE='D:\DATA ANALYSIS\N Time Series Tests and Forecasting
\SARIMA Model\SPSS_Output\sav\sarima-model_spss_ready_
data.sav' /COMPRESSED.
1044  0 ECHO 'SARIMA Model'.
1044  0 M> ECHO 'SARIMA Model'.
SARIMA Model
1045  0 ECHO 'Method type: seasonal_integrated_model'.
1045  0 M> ECHO 'Method type: seasonal_integrated_model'.
Method type: seasonal_integrated_model
1046  0 ECHO 'Design: SARIMA(1,0,1)x(1,0,1)[12] model for G3 with a 12-step f
orecast.'.
1046  0 M> ECHO 'Design: SARIMA(1,0,1)x(1,0,1)[12] model for G3 with a 12-ste
p forecast.'.
Design: SARIMA(1,0,1)x(1,0,1)[12] model for G3 with a 12-step forecast.
1047  0 ECHO 'Formula: phi(B)Phi(B^12)y_t=theta(B)Theta(B^12)e_t'.
1047  0 M> ECHO 'Formula: phi(B)Phi(B^12)y_t=theta(B)Theta(B^12)e_t'.
Formula: phi(B)Phi(B^12)y_t=theta(B)Theta(B^12)e_t
1048  0 ECHO 'Series order: source-row order'.
1048  0 M> ECHO 'Series order: source-row order'.
Series order: source-row order
1049  0 ECHO 'nonseasonal_p = 1'.
1049  0 M> ECHO 'nonseasonal_p = 1'.
nonseasonal_p = 1
1050  0 ECHO 'nonseasonal_d = 0'.
1050  0 M> ECHO 'nonseasonal_d = 0'.
nonseasonal_d = 0
1051  0 ECHO 'nonseasonal_q = 1'.
1051  0 M> ECHO 'nonseasonal_q = 1'.
nonseasonal_q = 1
1052  0 ECHO 'seasonal_P = 1'.
1052  0 M> ECHO 'seasonal_P = 1'.
seasonal_P = 1
1053  0 ECHO 'seasonal_D = 0'.
1053  0 M> ECHO 'seasonal_D = 0'.
seasonal_D = 0
1054  0 ECHO 'seasonal_Q = 1'.
1054  0 M> ECHO 'seasonal_Q = 1'.
seasonal_Q = 1
1055  0 ECHO 'seasonal_period = 12'.
```

SARIMAModel

```
1055  0 M> ECHO 'seasonal_period = 12'.
seasonal_period = 12
1056  0 ECHO 'aic = 3350.4058712630613'.
1056  0 M> ECHO 'aic = 3350.4058712630613'.
aic = 3350.4058712630613
1057  0 ECHO 'bic = 3377.2584675632856'.
1057  0 M> ECHO 'bic = 3377.2584675632856'.
bic = 3377.2584675632856
1058  0 ECHO 'forecast_12 = 12.040107963602923'.
1058  0 M> ECHO 'forecast_12 = 12.040107963602923'.
forecast_12 = 12.040107963602923
1059  0 ECHO 'Cross-check status: pass'.
1059  0 M> ECHO 'Cross-check status: pass'.
Cross-check status: pass
1060  0 OUTPUT SAVE OUTFILE='D:\DATA ANALYSIS\N Time Series Tests and Forecas
ting\SARIMA Model\SPSS_Output\spv\sarima-model_spss_ou
tput.spv'.
1060  0 M> OUTPUT SAVE OUTFILE='D:\DATA ANALYSIS\N Time Series Tests and Fore
casting\SARIMA Model\SPSS_Output\spv\sarima-model_spss
_output.spv'.
1061  0 OUTPUT EXPORT /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=PRI
NTSETTING /PDF DOCUMENTFILE='D:\DATA ANALYSIS\N Time S
eries Tests and Forecasting\SARIMA Model\SPSS_Output\pdf\sarima-mo
del_spss_output.pdf'.
1061  0 M> OUTPUT EXPORT /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=
PRINTSETTING /PDF DOCUMENTFILE='D:\DATA ANALYSIS\N Tim
e Series Tests and Forecasting\SARIMA Model\SPSS_Output\pdf\sar
ima-model_spss_output.pdf'.
```