

```
302 0 OUTPUT ACTIVATE SurvivalAnalysisinPythonOutput.  
302 0 M> OUTPUT ACTIVATE SurvivalAnalysisinPythonOutput.  
303 0 TITLE 'Survival Analysis in Python'.  
303 0 M> TITLE 'Survival Analysis in Python'.
```

Survival Analysis in Python

```
304 0 GET DATA /TYPE=TXT /FILE='D:\DATA ANALYSIS\0 Survival Analysis\Survival Analysis in Python\dataset.csv' /ENCODING='UTF8' /D
      ELCASE=LINE /DELIMITERS=', ' /QUALIFIER='"' /ARRANGEMENT=DELIMITED
/FIRSTCASE=2
304 0 M> GET DATA /TYPE=TXT /FILE='D:\DATA ANALYSIS\0 Survival Analysis\Survival Analysis in Python\dataset.csv' /ENCODING='UTF8'
      /DELCASE=LINE /DELIMITERS=', ' /QUALIFIER='"' /ARRANGEMENT=DELIMITED /FIRSTCASE=2
305 0 /VARIABLES=school A8 sex A8 age F8.0 address A8 famsize A8 Pstatus A8 Medu F8.0 Fedu F8.0 Mjob A16 Fjob A16 reason A16 guardian A16 traveltime F8.0 studytime F8.0 failures F8.0 schoolsup 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.
305 0 M> /VARIABLES=school A8 sex A8 age F8.0 address A8 famsize A8 Pstatus A8 Medu F8.0 Fedu F8.0 Mjob A16 Fjob A16 reason A16 guardian A16 traveltime F8.0 studytime F8.0 failures F8.0 schoolsup 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.
306 0 DATASET NAME SurvivalAnalysisinPythonData.
306 0 M> DATASET NAME SurvivalAnalysisinPythonData.
307 0 COMPUTE duration=absences+1.
307 0 M> COMPUTE duration=absences+1.
308 0 COMPUTE event=(G3<10).
308 0 M> COMPUTE event=(G3<10).
309 0 COMPUTE cause=0.
309 0 M> COMPUTE cause=0.
310 0 IF(G3>0 AND G3<10) cause=1.
310 0 M> IF(G3>0 AND G3<10) cause=1.
311 0 IF(G3=0) cause=2.
311 0 M> IF(G3=0) cause=2.
312 0 COMPUTE competing_event=(cause>0).
312 0 M> COMPUTE competing_event=(cause>0).
313 0 COMPUTE sex_male=(sex='M').
313 0 M> COMPUTE sex_male=(sex='M').
```

Survival Analysis in Python

```
314 0 VARIABLE LABELS duration 'Demonstration duration: absences plus one'
event 'Academic failure event: G3 below ten' cause '0
      censored, 1 nonzero failure, 2 zero-grade competing event'.
314 0 M> VARIABLE LABELS duration 'Demonstration duration: absences plus on
e' event 'Academic failure event: G3 below ten' cause
      '0 censored, 1 nonzero failure, 2 zero-grade competing event'.
315 0 VALUE LABELS event 0 'Censored' 1 'Failure' /cause 0 'Censored' 1 'No
nzero failure' 2 'Zero grade'.
315 0 M> VALUE LABELS event 0 'Censored' 1 'Failure' /cause 0 'Censored' 1
'Nonzero failure' 2 'Zero grade'.
316 0 EXECUTE.
316 0 M> EXECUTE.
317 0 * BEGIN METHOD-SPECIFIC SPSS WORKFLOW.
317 0 M> * BEGIN METHOD-SPECIFIC SPSS WORKFLOW.
318 0 COXREG VARIABLES=duration WITH sex_male age studytime health /STATUS=
event(1) /METHOD=ENTER /PRINT ALL.
318 0 M> COXREG VARIABLES=duration WITH sex_male age studytime health /STAT
US=event(1) /METHOD=ENTER /PRINT ALL.
```

Cox Regression

Survival Analysis in Python

Notes

Output Created		18-JUL-2026 17:27:46
Comments		
Input	Data	D:\DATA ANALYSIS\O Survival Analysis\Survival Analysis in Python\dataset.csv
	Active Dataset	SurvivalAnalysisinPythonD ata
	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.
Syntax		COXREG VARIABLES=duration WITH sex_male age studytime health /STATUS=event(1) /METHOD=ENTER /PRINT ALL.
Resources	Processor Time	00:00:00.09
	Elapsed Time	00:00:00.11

[SurvivalAnalysisinPythonData]

Survival Analysis in Python

Case Processing Summary

		N	Percent
Cases available in analysis	Event ^a	100	15.4%
	Censored	549	84.6%
	Total	649	100.0%
Cases dropped	Cases with missing values	0	0.0%
	Cases with negative time	0	0.0%
	Censored cases before the earliest event in a stratum	0	0.0%
	Total	0	0.0%
Total		649	100.0%

a. Dependent Variable: Demonstration duration: absences plus one

Block 0: Beginning Block

Omnibus Tests of Model Coefficients

-2 Log Likelihood
1090.346

Block 1: Method = Enter

Omnibus Tests of Model Coefficients^a

-2 Log Likelihood	Overall (score)			Change From Previous Step			Change ...
	Chi-square	df	Sig.	Chi-square	df	Sig.	Chi-square
1079.639	10.118	4	.038	10.706	4	.030	10.706

Omnibus Tests of Model Coefficients^a

Change From Previous ..	
df	Sig.
4	.030

Survival Analysis in Python

a. Beginning Block Number 1. Method = Enter

Variables in the Equation

	B	SE	Wald	df	Sig.	Exp(B)	95.0% CI for Exp(B)	
							Lower	Upper
sex_male	.160	.211	.575	1	.448	1.173	.776	1.774
age	.083	.077	1.149	1	.284	1.086	.934	1.264
studytime	-.374	.152	6.093	1	.014	.688	.511	.926
health	.032	.071	.207	1	.649	1.033	.899	1.186

Correlation Matrix of Regression Coefficients

	sex_male	age	studytime
age	-.046		
studytime	.288	-.025	
health	-.113	.073	.026

Survival Table

Time	Baseline Cum Hazard	At mean of covariates		
		Survival	SE	Cum Hazard
1.00	.022	.950	.008	.051
3.00	.038	.915	.012	.089
4.00	.042	.906	.013	.099
5.00	.058	.874	.016	.135
6.00	.062	.865	.017	.145
7.00	.076	.839	.020	.176
8.00	.079	.833	.021	.183
9.00	.108	.778	.027	.251
10.00	.123	.752	.030	.286
11.00	.139	.724	.034	.323
13.00	.173	.669	.041	.402
15.00	.209	.614	.049	.487
17.00	.245	.566	.056	.569
23.00	.307	.490	.081	.713

Survival Analysis in Python

Survival Table

Time	Baseline Cum Hazard	At mean of covariates		
		Survival	SE	Cum Hazard
25.00	.411	.384	.109	.958
27.00	.561	.271	.109	1.306

Covariate Means

	Mean
sex_male	.410
age	16.744
studytime	1.931
health	3.536

```
319 0 ECHO 'Declared tie reference: BRESLOW'.
319 0 M> ECHO 'Declared tie reference: BRESLOW'.
Declared tie reference: BRESLOW
320 0 DESCRIPTIVES VARIABLES=age studytime health /STATISTICS=MEAN STDDEV M
IN MAX.
320 0 M> DESCRIPTIVES VARIABLES=age studytime health /STATISTICS=MEAN STDDE
V MIN MAX.
```

Descriptives

Survival Analysis in Python

Notes

Output Created		18-JUL-2026 17:27:46
Comments		
Input	Data	D:\DATA ANALYSIS\O Survival Analysis\Survival Analysis in Python\dataset.csv
	Active Dataset	SurvivalAnalysisinPythonD ata
	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=age studytime health /STATISTICS=MEAN STDDEV MIN MAX.
Resources	Processor Time	00:00:00.06
	Elapsed Time	00:00:00.06

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
age	649	15	22	16.74	1.218
studytime	649	1	4	1.93	.830
health	649	1	5	3.54	1.446
Valid N (listwise)	649				

```
321 0 ECHO 'Native SPSS cross-check of the standardized statsmodels PHReg d
esign'.
```

```
321 0 M> ECHO 'Native SPSS cross-check of the standardized statsmodels PHRe
g design'.
```

```
Native SPSS cross-check of the standardized statsmodels PHReg design
```

```
322 0 * END METHOD-SPECIFIC SPSS WORKFLOW.
```

Survival Analysis in Python

```
322 0 M> * END METHOD-SPECIFIC SPSS WORKFLOW.
323 0 SAVE OUTFILE='D:\DATA ANALYSIS\0 Survival Analysis\Survival Analysis
in Python\SPSS_Output\sav\survival-analysis-in-python_
      spss_ready_data.sav' /COMPRESSED.
323 0 M> SAVE OUTFILE='D:\DATA ANALYSIS\0 Survival Analysis\Survival Analys
is in Python\SPSS_Output\sav\survival-analysis-in-pyth
      on_spss_ready_data.sav' /COMPRESSED.
324 0 ECHO 'Survival Analysis in Python'.
324 0 M> ECHO 'Survival Analysis in Python'.
Survival Analysis in Python
325 0 ECHO 'Method type: software_specific_workflow'.
325 0 M> ECHO 'Method type: software_specific_workflow'.
Method type: software_specific_workflow
326 0 ECHO 'Design: Python statsmodels PHReg workflow with standardized con
tinuous covariates and Breslow tied-time handling.'.
326 0 M> ECHO 'Design: Python statsmodels PHReg workflow with standardized
continuous covariates and Breslow tied-time handling.'.
.
Design: Python statsmodels PHReg workflow with standardized continuous covaria
tes and Breslow tied-time handling.
327 0 ECHO 'Formula: PHReg maximizes Cox partial likelihood in Python'.
327 0 M> ECHO 'Formula: PHReg maximizes Cox partial likelihood in Python'.
Formula: PHReg maximizes Cox partial likelihood in Python
328 0 ECHO 'Duration encoding: absences plus one'.
328 0 M> ECHO 'Duration encoding: absences plus one'.
Duration encoding: absences plus one
329 0 ECHO 'Event encoding: G3 below ten'.
329 0 M> ECHO 'Event encoding: G3 below ten'.
Event encoding: G3 below ten
330 0 ECHO 'Competing event: G3 equals zero where applicable'.
330 0 M> ECHO 'Competing event: G3 equals zero where applicable'.
Competing event: G3 equals zero where applicable
331 0 ECHO 'python_engine = statsmodels.PHReg'.
331 0 M> ECHO 'python_engine = statsmodels.PHReg'.
python_engine = statsmodels.PHReg
332 0 ECHO 'events = 100'.
332 0 M> ECHO 'events = 100'.
events = 100
333 0 ECHO 'log_likelihood = -539.8196130174367'.
```

Survival Analysis in Python

```
333 0 M> ECHO 'log_likelihood = -539.8196130174367'.
log_likelihood = -539.8196130174367
334 0 ECHO 'aic_reference = 1087.6392260348734'.
334 0 M> ECHO 'aic_reference = 1087.6392260348734'.
aic_reference = 1087.6392260348734
335 0 ECHO 'largest_absolute_z = 2.4683006743064926'.
335 0 M> ECHO 'largest_absolute_z = 2.4683006743064926'.
largest_absolute_z = 2.4683006743064926
336 0 ECHO 'smallest_p_value = 0.013575623525419345'.
336 0 M> ECHO 'smallest_p_value = 0.013575623525419345'.
smallest_p_value = 0.013575623525419345
337 0 ECHO 'Cross-check status: pass'.
337 0 M> ECHO 'Cross-check status: pass'.
Cross-check status: pass
338 0 OUTPUT SAVE OUTFILE='D:\DATA ANALYSIS\0 Survival Analysis\Survival An
alysis in Python\SPSS_Output\spv\survival-analysis-in-
python_spss_output.spv'.
338 0 M> OUTPUT SAVE OUTFILE='D:\DATA ANALYSIS\0 Survival Analysis\Survival
Analysis in Python\SPSS_Output\spv\survival-analysis-
in-python_spss_output.spv'.
339 0 OUTPUT EXPORT /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=PRI
NTSETTING /PDF DOCUMENTFILE='D:\DATA ANALYSIS\0 Surviv
al Analysis\Survival Analysis in Python\SPSS_Output\pdf\survival-a
nalysis-in-python_spss_output.pdf'.
339 0 M> OUTPUT EXPORT /CONTENTS EXPORT=ALL LAYERS=PRINTSETTING MODELVIEWS=
PRINTSETTING /PDF DOCUMENTFILE='D:\DATA ANALYSIS\0 Sur
vival Analysis\Survival Analysis in Python\SPSS_Output\pdf\surv
ival-analysis-in-python_spss_output.pdf'.
```