

FILTER OFF.

>Error # 100. Command name: FILTER
>This command is not permitted before the beginning of file definition
>commands.
>Execution of this command stops.
USE ALL.

>Error # 105. Command name: USE
>This command is not valid before a working file has been defined.
>Execution of this command stops.
EXECUTE.

>Error # 105. Command name: EXECUTE
>This command is not valid before a working file has been defined.
>Execution of this command stops.

GET DATA

/TYPE=TXT
/FILE='D:\cramer_von_mises_test\student_cvm_spss_clean.csv'
/ENCODING='UTF8'
/DELCASE=LINE
/DELIMITERS=" , "
/QUALIFIER=' "'
/ARRANGEMENT=DELIMITED
/FIRSTCASE=2
/IMPORTCASE=ALL
/VARIABLES=
studytime F1.0
G1 F2.0
G2 F2.0
G3 F2.0
absences F3.0.

CACHE.

EXECUTE.

DATASET NAME CramerClean WINDOW=FRONT.

FILTER OFF.

USE ALL.

EXECUTE.

VALUE LABELS studytime

```
1 '<2 hours'  
2 '2 to 5 hours'  
3 '5 to 10 hours'  
4 '>10 hours'.
```

```
FORMATS studytime G1 G2 G3 absences (F8.0).  
EXECUTE.
```

```
TITLE 'Cramer von Mises SPSS Import Check'.
```

Cramer von Mises SPSS Import Check

FREQUENCIES VARIABLES=studytime.

Frequencies

[CramerClean]

Statistics

studytime

N	Valid	649
	Missing	0

studytime

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<2 hours	212	32.7	32.7	32.7
	2 to 5 hours	305	47.0	47.0	79.7
	5 to 10 hours	97	14.9	14.9	94.6
	>10 hours	35	5.4	5.4	100.0
	Total	649	100.0	100.0	

DESCRIPTIVES VARIABLES=G3 G1 G2 absences

/STATISTICS=MEAN STDDEV MIN MAX.

Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
G3	649	0	19	11.91	3.231
G1	649	0	19	11.40	2.745
G2	649	0	19	11.57	2.914
absences	649	0	32	3.66	4.641
Valid N (listwise)	649				

```
* =====.
* A. MAIN G3 MANUAL W2 CALCULATION.
* =====.
```

DATASET COPY CramerG3.

Cramer von Mises SPSS Import Check

```
DATASET ACTIVATE CramerG3.  
FILTER OFF.  
USE ALL.  
SELECT IF NOT MISSING(G3).  
EXECUTE.
```

```
SORT CASES BY G3(A).
```

```
COMPUTE sorted_order = $CASENUM.  
EXECUTE.
```

```
AGGREGATE  
  /OUTFILE=* MODE=ADDVARIABLES  
  /BREAK=  
  /n_total=N(G3)  
  /mean_G3=MEAN(G3)  
  /sd_G3=SD(G3).
```

```
COMPUTE fitted_normal_cdf = CDF.NORMAL(G3, mean_G3, sd_G3).  
COMPUTE empirical_midpoint = ((2 * sorted_order) - 1) / (2 * n_total).  
COMPUTE squared_difference = (fitted_normal_cdf - empirical_midpoint) ** 2.  
EXECUTE.
```

```
AGGREGATE  
  /OUTFILE=* MODE=ADDVARIABLES  
  /BREAK=  
  /sum_squared_difference=SUM(squared_difference).
```

```
COMPUTE W2_G3 = (1 / (12 * n_total)) + sum_squared_difference.  
FORMATS mean_G3 sd_G3 fitted_normal_cdf empirical_midpoint squared_difference  
sum_squared_difference W2_G3 (F12.6).  
EXECUTE.
```

```
TITLE 'Main G3 Cramer von Mises Manual Result'.
```

Main G3 Cramer von Mises Manual Result

```
LIST VARIABLES=n_total mean_G3 sd_G3 sum_squared_difference W2_G3  
/CASES=FROM 1 TO 1.
```

List

[CramerG3]

Main G3 Cramer von Mises Manual Result

n_total	mean_G3	sd_G3	sum_squared_difference	W2_G3
649	11.906009	3.230656	1.123946	1.124074

Number of cases read: 1 Number of cases listed: 1

TITLE 'First 20 Sorted Contribution Rows for G3'.

First 20 Sorted Contribution Rows for G3

```
LIST VARIABLES=sorted_order G3 fitted_normal_cdf empirical_midpoint squared_diff  
ference  
/CASES=FROM 1 TO 20.
```

List

First 20 Sorted Contribution Rows for G3

sorted_order	G3	fitted_normal_cdf	empirical_midpoint	squared_difference
1.00	0	.000114	.000770	.000000
2.00	0	.000114	.002311	.000005
3.00	0	.000114	.003852	.000014
4.00	0	.000114	.005393	.000028
5.00	0	.000114	.006934	.000047
6.00	0	.000114	.008475	.000070
7.00	0	.000114	.010015	.000098
8.00	0	.000114	.011556	.000131
9.00	0	.000114	.013097	.000169
10.00	0	.000114	.014638	.000211
11.00	0	.000114	.016179	.000258
12.00	0	.000114	.017720	.000310
13.00	0	.000114	.019260	.000367
14.00	0	.000114	.020801	.000428
15.00	0	.000114	.022342	.000494
16.00	1	.000368	.023883	.000553
17.00	5	.016273	.025424	.000084
18.00	6	.033766	.026965	.000046
19.00	6	.033766	.028505	.000028
20.00	6	.033766	.030046	.000014

Number of cases read: 20 Number of cases listed: 20

```

SAVE TRANSLATE
  /TYPE=CSV
  /OUTFILE='D:\cramer_von_mises_test\cramer_von_mises_spss_g3_contributions.csv'
v'
  /REPLACE
  /FIELDNAMES
  /CELLS=VALUES.

```

* =====.

First 20 Sorted Contribution Rows for G3

```
* B. VARIABLE COMPARISON: G1, G2, G3, ABSENCES.  
* =====.
```

```
DATASET ACTIVATE CramerClean.  
FILTER OFF.  
USE ALL.  
EXECUTE.
```

```
DATASET COPY CramerVars.  
DATASET ACTIVATE CramerVars.
```

```
VARSTOCASES  
  /MAKE value FROM G1 G2 G3 absences  
  /INDEX=variable_index.
```

Variables to Cases

```
[CramerVars]
```

Generated Variables

Name	Label
variable_index	<none>
value	<none>

Processing Statistics

Variables In	5
Variables Out	3

```
EXECUTE.
```

```
VALUE LABELS variable_index  
  1 'G1'  
  2 'G2'  
  3 'G3'  
  4 'absences'.
```

First 20 Sorted Contribution Rows for G3

```
SORT CASES BY variable_index(A) value(A).

DO IF ($CASENUM = 1 OR variable_index <> LAG(variable_index)).
  COMPUTE order_within_variable = 1.
ELSE.
  COMPUTE order_within_variable = LAG(order_within_variable) + 1.
END IF.
EXECUTE.

AGGREGATE
  /OUTFILE=* MODE=ADDVARIABLES
  /BREAK=variable_index
  /n_variable=N(value)
  /mean_variable=MEAN(value)
  /sd_variable=SD(value).

COMPUTE fitted_cdf_variable = CDF.NORMAL(value, mean_variable, sd_variable).
COMPUTE empirical_midpoint_variable = ((2 * order_within_variable) - 1) / (2 *
  n_variable).
COMPUTE squared_difference_variable = (fitted_cdf_variable - empirical_midpoint_variable) ** 2.
EXECUTE.

AGGREGATE
  /OUTFILE=* MODE=REPLACE
  /BREAK=variable_index
  /n_variable=FIRST(n_variable)
  /mean_variable=FIRST(mean_variable)
  /sd_variable=FIRST(sd_variable)
  /sum_squared_difference=SUM(squared_difference_variable).

COMPUTE W2_statistic = (1 / (12 * n_variable)) + sum_squared_difference.
FORMATS mean_variable sd_variable sum_squared_difference W2_statistic (F12.6).
EXECUTE.

TITLE 'Cramer von Mises W2 Variable Comparison in SPSS'.
```

Cramer von Mises W2 Variable Comparison in SPSS

```
LIST VARIABLES=variable_index n_variable mean_variable sd_variable W2_statistic
/CASES=FROM 1 TO 4.
```

List

variable_index	n_variable	mean_variable	sd_variable	W2_statistic
1	649	11.399076	2.745265	.709113
2	649	11.570108	2.913639	.829252
3	649	11.906009	3.230656	1.124074
4	649	3.659476	4.640759	7.116914

Number of cases read: 4 Number of cases listed: 4

```
SAVE TRANSLATE
/TYPE=CSV
/OUTFILE='D:\cramer_von_mises_test\cramer_von_mises_spss_variable_w2.csv'
/REPLACE
/FIELDNAMES
/CELLS=VALUES.
```

```
* =====.
* C. STUDYTIME GROUP-WISE G3 CHECK.
* =====.
```

```
DATASET ACTIVATE CramerClean.
FILTER OFF.
USE ALL.
EXECUTE.
```

```
DATASET COPY CramerStudytime.
DATASET ACTIVATE CramerStudytime.
```

```
SELECT IF NOT MISSING(G3) AND NOT MISSING(studytime).
EXECUTE.
```

Cramer von Mises W2 Variable Comparison in SPSS

```

SORT CASES BY studytime(A) G3(A).

DO IF ($CASENUM = 1 OR studytime <> LAG(studytime)).
  COMPUTE order_within_studytime = 1.
ELSE.
  COMPUTE order_within_studytime = LAG(order_within_studytime) + 1.
END IF.
EXECUTE.

AGGREGATE
  /OUTFILE=* MODE=ADDVARIABLES
  /BREAK=studytime
  /n_group=N(G3)
  /mean_group=MEAN(G3)
  /sd_group=SD(G3).

COMPUTE fitted_cdf_group = CDF.NORMAL(G3, mean_group, sd_group).
COMPUTE empirical_midpoint_group = ((2 * order_within_studytime) - 1) / (2 * n_group).
COMPUTE squared_difference_group = (fitted_cdf_group - empirical_midpoint_group) ** 2.
EXECUTE.

AGGREGATE
  /OUTFILE=* MODE=REPLACE
  /BREAK=studytime
  /n_group=FIRST(n_group)
  /mean_group=FIRST(mean_group)
  /sd_group=FIRST(sd_group)
  /sum_squared_difference=SUM(squared_difference_group).

COMPUTE W2_statistic = (1 / (12 * n_group)) + sum_squared_difference.
FORMATS mean_group sd_group sum_squared_difference W2_statistic (F12.6).
EXECUTE.

TITLE 'Cramer von Mises W2 for G3 by Studytime Group in SPSS'.
```

Cramer von Mises W2 for G3 by Studytime Group in SPSS

```
LIST VARIABLES=studytime n_group mean_group sd_group W2_statistic
/CASES=FROM 1 TO 4.
```

List

studytime	n_group	mean_group	sd_group	W2_statistic
1	212	10.844340	3.218624	.828835
2	305	12.091803	3.243125	.535579
3	97	13.226804	2.502104	.141094
4	35	13.057143	3.038410	.104542

Number of cases read: 4 Number of cases listed: 4

```
SAVE TRANSLATE
```

```
  /TYPE=CSV
```

```
  /OUTFILE='D:\cramer_von_mises_test\cramer_von_mises_spss_studytime_w2.csv'
```

```
  /REPLACE
```

```
  /FIELDNAMES
```

```
  /CELLS=VALUES.
```

```
* =====.
* D. EXPORT SPSS OUTPUT PDF.
* =====.
```

```
OUTPUT EXPORT
```

```
  /CONTENTS EXPORT=VISIBLE
```

```
  /PDF DOCUMENTFILE='D:\cramer_von_mises_test\cramer_von_mises_test_SPSS_outpu
t_SAFE.pdf'.
```

Output Export

Export Summary

Viewer	Document2
Document File	D: \cramer_von_mises_test\cramer_ von_mises_test_SPSS_output_S AFE.pdf