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## Cross Correlation

Cross Correlation  
Import data

## Cross Correlation Context

```
>Warning # 2004.  Command name: SUBTITLE  
>The subtitle given exceeds 60 characters in length.  The first 60 characters  
>will be used.
```

Cross Correlation Context  
Same-row Pearson correlations before lagged cross-correlatio

## Correlations

[CrossCorrelationData] D:\DATA ANALYSIS\G Correlation Tests\Cross Correlation\  
SPSS\_Output\sav\Cross-Correlation-data.sav

### Correlations

|  |                     | First period<br>grade / default<br>X series | Second period<br>grade | Final grade /<br>default Y series |
|--|---------------------|---|------------------------|-----------------------------------|
| First period grade / default<br>X series | Pearson Correlation | 1   | .865**                 | .826**                            |
|  | Sig. (2-tailed)     |   | .000                   | .000                              |
|  | N                   | 649   | 649                    | 649                               |
| Second period grade                      | Pearson Correlation | .865**                                      | 1                      | .919**                            |
|  | Sig. (2-tailed)     | .000  |                        | .000                              |
|  | N                   | 649   | 649                    | 649                               |
| Final grade / default Y<br>series        | Pearson Correlation | .826**                                      | .919**                 | 1                                 |
|  | Sig. (2-tailed)     | .000  | .000                   |                                   |
|  | N                   | 649   | 649                    | 649                               |
| School absences                          | Pearson Correlation | -.147**                                     | -.125**                | -.091*                            |
|  | Sig. (2-tailed)     | .000  | .001                   | .020                              |
|  | N                   | 649   | 649                    | 649                               |
| studytime                                | Pearson Correlation | .261**                                      | .240**                 | .250**                            |
|  | Sig. (2-tailed)     | .000  | .000                   | .000                              |
|  | N                   | 649   | 649                    | 649                               |
| failures                                 | Pearson Correlation | -.384**                                     | -.386**                | -.393**                           |
|  | Sig. (2-tailed)     | .000  | .000                   | .000                              |
|  | N                   | 649   | 649                    | 649                               |

Cross Correlation Context  
Same-row Pearson correlations before lagged cross-correlatio

**Correlations**

|  |                     | School<br>absences | studytime | failures |
|--|---------------------|--------------------|-----------|----------|
| First period grade / default<br>X series | Pearson Correlation | -.147**            | .261**    | -.384**  |
|  | Sig. (2-tailed)     | .000               | .000      | .000     |
|  | N                   | 649                | 649       | 649      |
| Second period grade                      | Pearson Correlation | -.125**            | .240**    | -.386**  |
|  | Sig. (2-tailed)     | .001               | .000      | .000     |
|  | N                   | 649                | 649       | 649      |
| Final grade / default Y<br>series        | Pearson Correlation | -.091*             | .250**    | -.393**  |
|  | Sig. (2-tailed)     | .020               | .000      | .000     |
|  | N                   | 649                | 649       | 649      |
| School absences                          | Pearson Correlation | 1                  | -.118**   | .123**   |
|  | Sig. (2-tailed)     |                    | .003      | .002     |
|  | N                   | 649                | 649       | 649      |
| studytime                                | Pearson Correlation | -.118**            | 1         | -.147**  |
|  | Sig. (2-tailed)     | .003               |           | .000     |
|  | N                   | 649                | 649       | 649      |
| failures                                 | Pearson Correlation | .123**             | -.147**   | 1        |
|  | Sig. (2-tailed)     | .002               | .000      |          |
|  | N                   | 649                | 649       | 649      |

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

## Cross Correlation Context

Cross Correlation Context  
Descriptive statistics for default X and Y series

## Descriptives

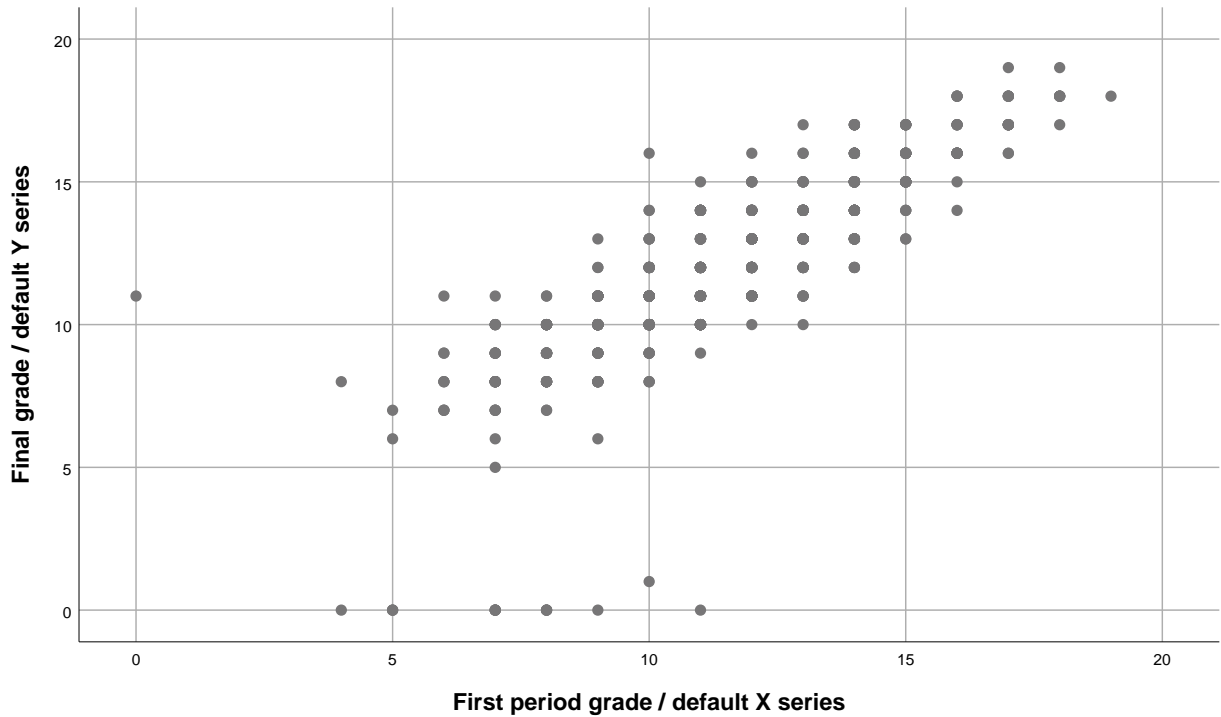
### Descriptive Statistics

|                                       | N   | Minimum | Maximum | Mean  | Std. Deviation |
|---------------------------------------|-----|---------|---------|-------|----------------|
| First period grade / default X series | 649 | 0       | 19      | 11.40 | 2.745          |
| Final grade / default Y series        | 649 | 0       | 19      | 11.91 | 3.231          |
| Valid N (listwise)                    | 649 |         |         |       |                |

## Cross Correlation Scatterplot

Cross Correlation Scatterplot  
Same-row scatterplot for G1 and G3

Graph



Embedded Python Cross Correlation Results

Series X: G1

Series Y: G3

Lag convention: positive lag means  $X_t$  is compared with  $Y_{(t+lag)}$ .

Lag 0 r: 0.826387

Strongest lag: 0 r: 0.826387

Tables saved to: D:\DATA ANALYSIS\G Correlation Tests\Cross Correlation\SPSS\_0  
output\tables

Chart/PDF creation skipped because matplotlib was not available or failed: No  
module named 'matplotlib'