**SPSS Practical 5:**

**//**

**Assumptions in Pearson’s Correlation Test:**

1. **Interval or ratio level(Continous Data)**
2. **There needs to be a linear relationship**
3. **There should be no significant outliers**
4. **Approximately normal distributions**

**Assumption in Spearman’s Rho and Kendall’s Tau**

**NONE**

**//**

**Part A: Correlation Test**

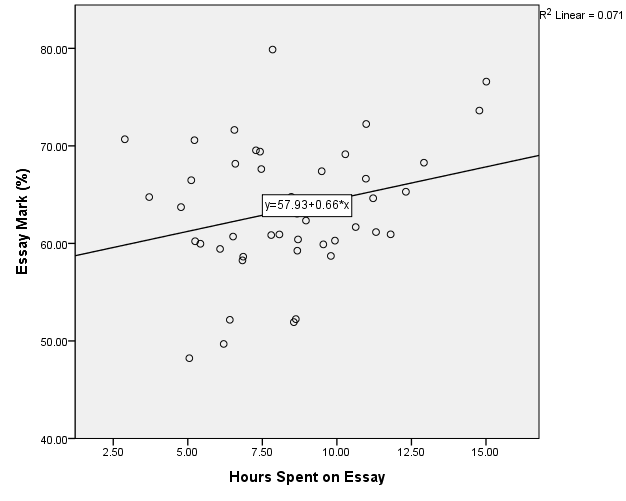
A student was interested in whether there was a positive relationship between the time spent doing an essay and the mark received. He got 45 of his friends and timed how long they spent writing an essay (**hours**) and the percentage they got in the essay (**score**). He also translated these grades into their degree classifications (**grade**): first, upper second, lower second and third class.

// Outcome is Score

1. Write the null and alternative hypothesis for this test?

생략

1. By using the data in the file **EssayMarks.sav**, find out what the relationship was between the time spent doing an essay (hours) and the eventual mark in terms of
2. Score // Y축 X축 확실하게 정해주기



The scatterplot shows that there is a weak positive relationship

// KS test Analyze -> de -> explore -> plot, Normal~~check

Normality TEST:

:Normality can be assumed.

:Normality cannot be assumed.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Tests of Normality** | | | | | | |
|  | Kolmogorov-Smirnova | | | Shapiro-Wilk | | |
| Statistic | df | Sig. | Statistic | df | Sig. |
| Hours Spent on Essay | .091 | 45 | .200\* | .981 | 45 | .662 |
| Essay Mark (%) | .110 | 45 | .200\* | .977 | 45 | .518 |
| \*. This is a lower bound of the true significance. | | | | | | |
| a. Lilliefors Significance Correction | | | | | | |

For Essay Mark(K-S Test)

D(45) = 0.110, sig = 0.200 ( > 0.05)

This test is not significant

Assept

Conclusion : It’s a normal distribution

For Hours(K-S Test)

D(45) = 0.977, sig = 0.200 ( > 0.05)

This test is not significant

Assept

Conclusion : It’s a normal distribution

**//**

**Analyze -> Correlate -> Bi~ -> options 확인**

Pearson , be) normality test

Be positive relationship , one-tailed check

//

Pearson’s Correlation Test

|  |  |  |  |
| --- | --- | --- | --- |
| **Correlations** | | | |
|  | | Essay Mark (%) | Hours Spent on Essay |
| Essay Mark (%) | Pearson Correlation | 1 | .267\* |
| Sig. (1-tailed) |  | .038 |
| N | 45 | 45 |
| Hours Spent on Essay | Pearson Correlation | .267\* | 1 |
| Sig. (1-tailed) | .038 |  |
| N | 45 | 45 |
| \*. Correlation is significant at the 0.05 level (1-tailed). | | | |

Pearson Correlation == R value

:r = 0

:r > 0 // be positive relationship

The Correlation is r(45) = 0.267, sig = 0.038( < 0.05)

This test is significant.

Reject

Conclustion : There is a positive relationship.

1. Degree Test // Analyze -> Correlate -> B~ -> Kendall , Spear,one tail

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Correlations** | | | | |
|  | | | Hours Spent on Essay | Grade |
| Kendall's tau\_b | Hours Spent on Essay | Correlation Coefficient | 1.000 | -.158 |
| Sig. (1-tailed) | . | .089 |
| N | 45 | 45 |
| Grade | Correlation Coefficient | -.158 | 1.000 |
| Sig. (1-tailed) | .089 | . |
| N | 45 | 45 |
| Spearman's rho | Hours Spent on Essay | Correlation Coefficient | 1.000 | -.193 |
| Sig. (1-tailed) | . | .102 |
| N | 45 | 45 |
| Grade | Correlation Coefficient | -.193 | 1.000 |
| Sig. (1-tailed) | .102 | . |
| N | 45 | 45 |

Kendall’s Tau Correlation Test:

The Correlation is (45) = -0.158, sig = 0.089 (> 0.05)

This test is non-significant

Accept

Conclusion : There is no relationship

**Important**: You may need to draw a scatterplot to support your answer

**Part B: Partial Correlation Test**

**// All thing have relationship**

**// partial co~ = 한쪽을 제거해서 real relationship에 간섭하지 못 하게함.**

* A partial correlation provides an index of whether two variables are linearly related (hours and score) if the effects of a third control variable (say IQ) are removed from their relationship.
* A partial correlation is a type of Pearson correlation coefficient that can range in value from -1 to +1.
* A significant positive partial correlation implies that as the values on one variable increase, the values on a second variable also tend to increase, while holding constant the values of the control variable(s).

A professor was interested in whether there was a positive relationship between the time spent doing an essay and the mark received when considering the IQ of each student.

1. Write the null and alternative hypothesis for this test?
2. Perform the partial correlation test and interpret the SPSS output.

// Analyze -> co~ -> Partial, 항목 잘 지정(IQ relate 제거)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Correlations** | | | | |
| Control Variables | | | Essay Mark (%) | Hours Spent on Essay |
| IQ | Essay Mark (%) | Correlation | 1.000 | .247 |
| Significance (1-tailed) | . | .053 |
| df | 0 | 42 |
| Hours Spent on Essay | Correlation | .247 | 1.000 |
| Significance (1-tailed) | .053 | . |
| df | 42 | 0 |

Partial Correlation Test: // r- value

The Correlation is (42) = 0.247, sig = 0.053 (> 0.05)

This test is non-significant

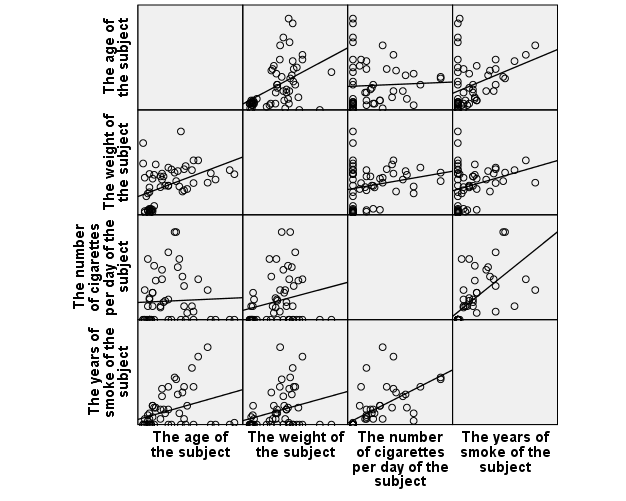
Accept

Conclusion : The time spent doing an essay is unrelated to the mark received when controlling for the student’s IQ

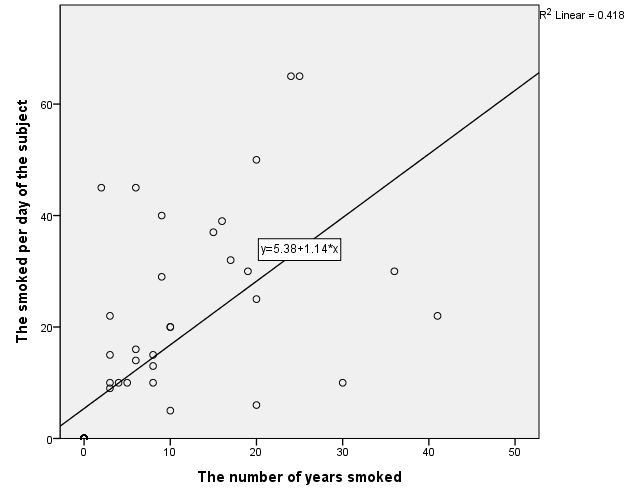
**Part C:**

From the Smoking\_Survey file, identify variables with the following relationships (use scatterplot and coefficient of determination value to support your answer):

//scatterplot, box plot 스케일데이터 4개 한꺼번에 넣고 함.

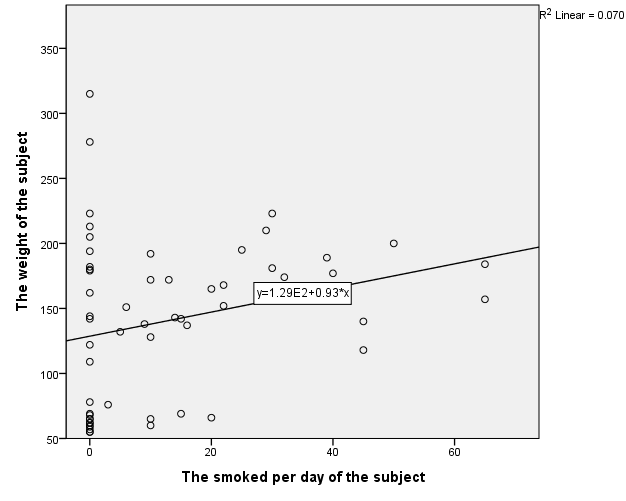


1. Strongest positive relationship:

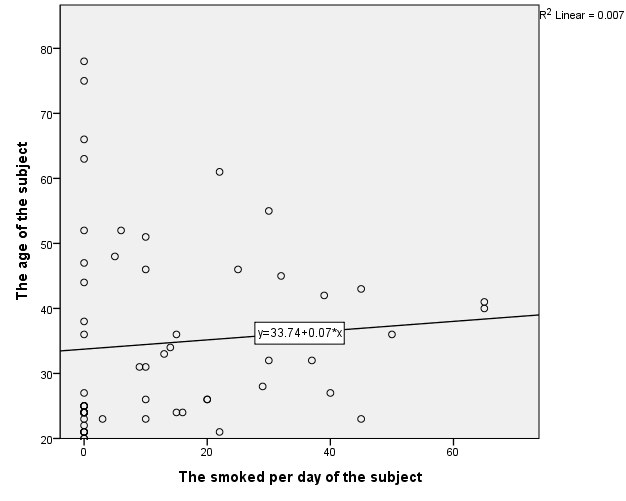


There is a positive moderate relationship,

1. Weakest positive relationship:

  
There is a positive weak relationship,

1. No relationship:



There is a no relationship,