Time Frame: 50 minutes

Subject Matter: Correlation Coefficient

TELL ME

Objective: TSWBAT compute the correlation coefficient between the two variables and classify analytically the relationships as either positive, negative, or zero.

Standards: DA – 3.6

 Materials: Interwrite Presentations, Calculators, and Worksheets

SHOW ME

Presentation of Information:

The students will be asked to solve the following problems.

In each of the following, compute the value of the correlation coefficient for the variables and classify analytically the relationship between the two variables as either positive, negative, or zero.

1. An educator wants to see how strong the relationship is between a student’s score on a test and his/her grade-point average. The data obtained from the sample are shown.

Solution:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test score (x) | GPA (y) | $$xy$$ | $$x^{2}$$ | $$y^{2}$$ |
| 98 | 2.1 |  |  |  |
| 105 | 2.4 |  |  |  |
| 100 | 3.2 |  |  |  |
| 100 | 2.7 |  |  |  |
| 106 | 2.2 |  |  |  |
| 95 | 2.3 |  |  |  |
| 116 | 3.8 |  |  |  |
| 112 | 3.4 |  |  |  |
| $$∑x=$$ | $$∑y=$$ | $$∑xy=$$ | $$∑x^{2}=$$ | $$∑y^{2}=$$ |

|  |  |
| --- | --- |
| Test score (x) | GPA (y) |
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| 100 | 2.7 |
| 106 | 2.2 |
| 95 | 2.3 |
| 116 | 3.8 |
| 112 | 3.4 |

$$r= \frac{n\left(∑xy\right)-\left(∑x\right)\left(∑y\right)}{\sqrt{\left[n\left(∑x^{2}\right)-\left(∑x\right)^{2}\right]\left[n\left(∑y^{2}\right)-\left(∑y\right)^{2}\right]}}$$

1. An English instructor is interested in finding the strength of a relationship between the final exam grades enrolled in Composition I and Composition II classes. The data are given in below.

|  |  |
| --- | --- |
| Composition I (x) | Composition II (y) |
| 83 | 78 |
| 97 | 95 |
| 80 | 83 |
| 95 | 97 |
| 73 | 78 |
| 78 | 72 |
| 91 | 96 |
| 86 | 80 |

1. An insurance company wants to determine the strength of the relationship between the number of hours a person works per week and the number of injuries or accidents that person has over a period of one week. The data are shown.

|  |  |
| --- | --- |
| Hours worked (x) | No. of accidents (y) |
| 40 | 1 |
| 32 | 0 |
| 36 | 3 |
| 44 | 41 |

1. An emergency service wishes to see whether a relationship exists between the outside temperature and the number of emergency calls it receives for a 7-hour period. The data are shown.

|  |  |
| --- | --- |
| Temperature (x) | No. of call (y) |
| 68 | 7 |
| 74 | 4 |
| 82 | 8 |
| 88 | 10 |
| 93 | 11 |
| 99 | 9 |
| 101 | 13 |