**Dr. Peggy Kern’s Capstone Statistics**

**Practice #3: Correlations**

*Statistics are learned best by doing! Here is a set of exercises to let you practice what we have covered on the correlations. See if you can work through them before checking your responses.*

1. **For the following correlations (*r*):** 0.29 -0.63 0.15 -0.34 0.04
   1. Which is the **strongest** correlation**?**
   2. Which is the **weakest** correlation?
2. Janice and Paul did a study on feelings of stress and life satisfaction. Participants completed a measure on how stressed they were feeling (on a 1 to 30 scale) and a measure of how satisfied they felt with their lives (measured on a 1 to 10 scale). The table below indicates the participants’ scores. **Using this data, answer the following questions:**

|  |  |  |
| --- | --- | --- |
| **Participant #** | **Stress score (X)** | **Life Satisfaction (Y)** |
| 1 | 11 | 7 |
| 2 | 25 | 1 |
| 3 | 19 | 4 |
| 4 | 7 | 9 |
| 5 | 23 | 2 |
| 6 | 6 | 8 |
| 7 | 11 | 8 |
| 8 | 22 | 3 |
| 9 | 25 | 3 |
| 10 | 10 | 6 |
| **∑** | 159 | 51 |
| **Mean** | 15.9 | 5.1 |
| **SD** | 7.23 | 2.70 |

1. On a scrap paper, try to draw a rough scatterplot of the data, just to get an idea of what these look like.
2. ****There are multiple ways to calculate a correlation coefficient r (that is, a standardized indicator of the relation between two variables). We can calculate the **covariation** between two variables (X and Y), and then adjust this by the standard deviation and sample size.

****Alternatively, we can calculate *r* from the Z scores:

1. Using either method, **calculate the correlation (r) between stress and life satisfaction**.
2. Write a brief interpretation of this correlation, including the strength, direction, and an explanation of the effect.
3. Can you say that being more stressed causes a lower level of life satisfaction? Why or why not?
4. At Hogwarts School of Witchcraft and Wizardry, students often have a lot of homework. The table below indicates the number of hours students studied, and how they performed on an exam in two of their classes.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Student** | **Potions** | | **Defence against the dark arts** | |
|  | **study hours** | **exam score** | **study hours** | **exam score** |
| 1 | 3 | 75 | 4 | 70 |
| 2 | 15 | 95 | 12 | 98 |
| 3 | 6 | 65 | 9 | 85 |
| 4 | 8 | 70 | 6 | 80 |
| 5 | 4 | 85 | 2 | 65 |
| 6 | 2 | 80 | 3 | 75 |
| 7 | 10 | 65 | 10 | 92 |
| Mean | 6.86 | 76.43 | 6.57 | 80.71 |
| SD | 4.22 | 10.25 | 3.54 | 10.95 |

1. Find the correlations between hours spent studying and how students performed in their potions and defense against the dark arts classes.
2. Which class was more strongly correlated with studying?