The dataset **opl\_female.csv** contains data on females who have completed in different powerlifting competitions since 1964. The motivation for this data analysis is to explore the relationships between the bench, squat, and deadlift events (in kilograms) in order to gain insights into the performance patterns of athletes. By analyzing relationships, we can understand the interplay between different segments of the competition and potentially identify areas of improvement for athletes. For this activity, we will focus on female competitors who are 25 years old.

1. Watch the Introductory Video
2. Graph and describe the distribution for each event of Open Power Lifting
   1. Bench
   2. Squat
   3. Deadlift
3. Graph the following relationships between the legs of the race.
   1. Bench vs. Squat
   2. Bench vs. Deadlift
   3. Squat vs. Deadlift

|  |  |  |  |
| --- | --- | --- | --- |
| **Relationship** | **Correlation Appropriate?** | | **Guess for correlation** |
| Bench vs. Squat | Yes | No | r = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Bench vs. Deadlift | Yes | No | r = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Squat vs. Deadlift | Yes | No | r = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

1. From Question 3, is a correlation an appropriate calculation for these data? If so, guess the correlation between the different events.

|  |  |
| --- | --- |
| **Relationship** | **Correlation** |
| Bench vs. Squat | r = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Bench vs. Deadlift | r = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Squat vs. Deadlift | r = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

1. Now, using technology, calculate the correlations and compare them to your guesses

1. Which relationship has the largest correlation? What is a possible reason why we may see this?
2. Which relationship has the smallest correlation? What is a possible reason why we may see this?
3. This data is only looking at females. How might these relationships be different for males that competed?
4. What do these correlations suggest for athletes about which events they want to concentrate on?