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 See Page 3
   3. Deadlift
3. Graph the following relationships between the legs of the race.
   1. Bench vs. Squat
   2. Bench vs. Deadlift See Page 4
   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**  0.821 |
| Bench vs. Squat | r = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  0.782 |
| Bench vs. Deadlift | r = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  0.863 |
| 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?

r = 0863. A possible explanation for this would be that both squat and deadlift use length strength which isn’t seen when someone benches. They have similar motions.

1. Which relationship has the smallest correlation? What is a possible reason why we may see this?

r = 0.782. A possible explanation for this would be that bench and deadlift have different limitations. Leg strength isn’t a factor when benching weights. Bench requires much more arm strength.

1. These data are for finishers of the triathlon. How might these relationships be different for athletes that did not finish or were disqualified?

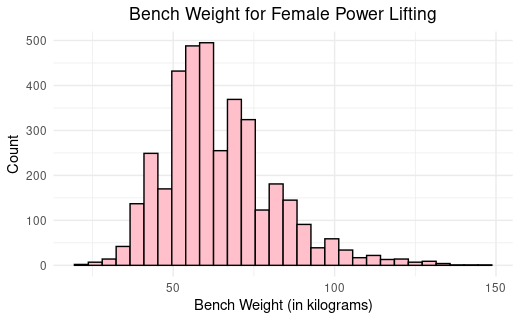
Answers may vary

Sample Response: The times for non-finishers way be very high and that may alter the linear relationships between the legs of the triathlon.

1. What do these correlations suggest for athletes about the aspects of their race they want to concentrate on?

Answers may vary

Sample Response: Focus on swimming and one of either biking or running.



Min: 20

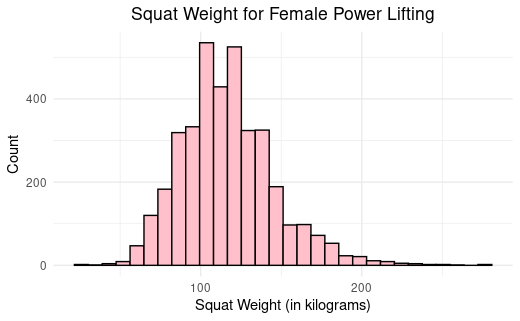
1st Quartile: 52.50

Median: 62.50

Mean: 64.25

3rd Quartile: 72.50

Max: 145



Min: 25

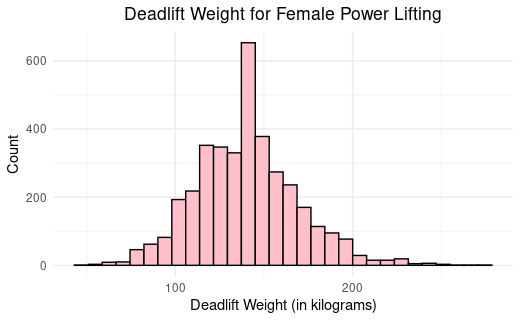
1st Quartile: 97.50

Median: 115

Mean: 116.80

3rd Quartile: 132.50

Max: 275.50



Min: 45

1st Quartile: 120

Median: 140

Mean: 140.20

3rd Quartile: 157.50

Max: 272.5

