**Activity Description: Simple Linear Regression**

**Introduction:**

Welcome to this activity focused on simple linear regression analysis. In this worksheet, you will explore a dataset containing information about the female competitors of various powerlifting tournaments over the past 50 years. Specifically, you will analyze squat weights to predict bench weights for the competitors. Through this activity, you will gain practical experience in performing linear regression analysis, interpreting the results, and making predictions based on the model.

**Learning Objectives:**

By the end of this activity, you will be able to:

1. Understand the concept of simple linear regression and its application in statistical analysis.

2. Identify the predictor (independent) and response (dependent) variables in a regression analysis.

3. Interpret the regression output, including the coefficient estimates, residuals, and R-squared value.

4. Make predictions based on the regression model and evaluate the accuracy of the predictions.

**Methods:**

Before diving into this worksheet, it is important to have a foundational understanding of certain statistical concepts and techniques. The following prior knowledge will be helpful in completing this activity successfully:

1. Variables: Understanding the difference between predictor (independent) and response (dependent) variables is essential in the context of regression analysis. In this dataset, the predictor variable would be bike times, while the response variable would be run times.

2. Scatter Plots: Familiarity with scatter plots, which depict the relationship between two continuous variables, is crucial. Scatter plots visually represent the data points and can help identify the nature and strength of the relationship between the predictor and response variables.

3. Simple Linear Regression: Knowledge of simple linear regression as a statistical technique for modeling the relationship between two continuous variables is essential. You should understand the concept of a regression line, how it is estimated, and how it can be used to make predictions.

4. Prediction and Evaluation: Knowledge of how to make predictions based on the regression model and evaluate their accuracy.