**Linear Regression on Men 100m World Record**

This paper applies linear regression (LR) from the SkLearn library to investigate the relationship between the men's 100m world record (WR) time and its respective year. Before training the model, we analyze the correlation between variables. The most correlated variables are between the WR time and WR year, with a -0.91 correlation. Therefore, our LR model will be fitted with these two variables.

Chart

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OLS Regression Results

========================================================================== MSE: 0.0026 R-squared: 0.874

RMSE: 0.0519 Adj. R-squared: 0.865

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coef std err t P>|t| [0.025 0.975]

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const 25.6096 1.596 16.045 0.000 22.186 29.033

x1 -0.0079 0.001 -9.875 0.000 -0.010 -0.006

==========================================================================

The R-squared and adj- R-squared convey a significant strength between the independent and dependent variable. Our model reveals that 85% of the variability in the target variable (WR time) is explained by the dependent variable. In the same vein, the error metrics MSE and RMSE confirm such a strong relationship (Year).

MSE (Mean Squared Error) is the difference between the first and predicted values, which is calculated by squaring the average difference over the data set. It's a metric that measures how close a fitted line is to the actual data points.

RMSE is the error rate multiplied by the square root of MSE (Root Mean Squared Error). Because it can be easily translated into dimension units, RMSE is a better measure of fit than a correlation coefficient.

In the future, athletes will continue to break world records due to investment within the sport, but WR time will be much more difficult to break as we challenge the boundaries of the human body.