

Regression Coefficients

Test name: Regression Coefficients

Dataset: D:/DATA ANALYSIS/H Regression Tests and Models/Regression Coefficients/dataset.csv

Rows in original dataset: 649

Rows used in model: 649

Outcome: G3

Predictors: G1, G2, studytime, failures, absences, age

Formula: $G3 \sim G1 + G2 + \text{studytime} + \text{failures} + \text{absences} + \text{age}$

R-squared: 0.850632

Adjusted R-squared: 0.849236

Overall F statistic: 609.352742

Overall model p-value: $3.254128277e-261$

RMSE: 1.254409

Strongest standardized predictor: G2 beta = 0.796713

Interpretation: unstandardized B is the expected outcome change for a one-unit predictor increase, controlling other predictors.

Standardized beta compares predictor strength on a common scale.

A 95% confidence interval excluding zero and $p < 0.05$ indicate stronger evidence for a coefficient effect.

Squared semi-partial correlation is the unique contribution to R-squared.

VIF values of 5 or more warrant closer multicollinearity review.

Charts generated: 8

Regression coefficients

term	coefficient_b	standard_error	t_value	p_value	ci95_lower	ci95_upper
(Intercept)	-0.54531480	0.76263548	-0.7150399	4.748443e-01	-2.042876127	0.95224653
G1	0.14216855	0.03658857	3.8856004	1.126739e-04	0.070320825	0.21401627
G2	0.88339876	0.03420986	25.8229266	2.206497e-101	0.816222016	0.95057550
studytime	0.09457944	0.06196635	1.5263031	1.274269e-01	-0.027101783	0.21626066
failures	-0.23315622	0.09493193	-2.4560358	1.431172e-02	-0.419570816	-0.04674162
absences	0.02267927	0.01087356	2.0857261	3.739772e-02	0.001327229	0.04403132
age	0.02364114	0.04347324	0.5438091	5.867616e-01	-0.061725777	0.10900806

decision_alpha_0_05

Not statistically significant

Statistically significant

Statistically significant

Not statistically significant

Statistically significant

Statistically significant

Not statistically significant

Standardized coefficients

term	unstandardized_b	standardized_beta	absolute_standardized_beta
G2	0.88339876	0.79671268	0.79671268
G1	0.14216855	0.12080838	0.12080838
failures	-0.23315622	-0.04281374	0.04281374
absences	0.02267927	0.03257822	0.03257822
studytime	0.09457944	0.02428440	0.02428440
age	0.02364114	0.00891403	0.00891403

Zero-order, partial, and part correlations

term	zero_order_correlation	partial_correlation	semi_partial_part_correlation	unique_r_squared_contribution
G1	0.82638712	0.15158042	0.059267833	3.512676e-03
G2	0.91854800	0.71378088	0.393882216	1.551432e-01
studytime	0.24978869	0.06012938	0.023281003	5.420051e-04
failures	-0.39331555	-0.09647981	-0.037462401	1.403431e-03
absences	-0.09137906	0.08203956	0.031813993	1.012130e-03
age	-0.10650539	0.02145749	0.008294828	6.880417e-05

Multicollinearity statistics

term	vif	tolerance	decision
G1	4.154857	0.2406822	Acceptable
G2	4.091388	0.2444158	Acceptable
studytime	1.088056	0.9190701	Acceptable
failures	1.306096	0.7656406	Acceptable
absences	1.048621	0.9536337	Acceptable
age	1.154871	0.8658977	Acceptable















