Linear regression

POSTER · THE MODULE AT A GLANCE

Exam Mon, 7 Dec 2026 · 180 min

1 Reading regression output

Coefficient
How much does Y change per unit of X, other variables held constant?

p-value
Is the effect significantly different from zero?

R^2
What share of the variation in Y does the model explain?

Three questions for every linear regression.

2 Assumptions of linear regression

1. Linear relationship
2. Independent observations
3. Normally distributed residuals
4. Constant variance

Check them on the residuals.

EXAM LIKELIHOOD

Interpreting regression coefficients (ceteris paribus, units)	97%
R-squared and goodness of fit	95%
Dummy variables and reference category	92%
Ordinary least squares (OLS)	92%
Omitted variable bias	92%
Error term and OLS assumptions	88%

COMMON MISTAKES

- ✖ **Omitted variable bias**: the missing variable is related to both y and x; the coefficient changes strongly when you add it.
- ✖ **Multicollinearity**: larger standard errors, no bias. **VIF** = 1/(1 – R2_j); watch out from about 5. Solution: drop or combine a variable.
- ✖ **Extrapolation** outside the range of x is unreliable.

KEY CONCEPTS

ordinary least squares · residual · error term · intercept · slope · ceteris paribus · R-squared · adjusted R-squared · standard error · t-value · p-value · confidence interval · dummy variable · reference category · omitted variable bias · multicollinearity · VIF · standardized coefficient · interaction term · F-test · partial F-test · mediation · extrapolation

HOW TO WRITE THE ANSWER

1. Term
model or concept, English term

2. Definition
definition or features, precisely

3. Case fact
concrete fact from the case

4. Conclusion
judgement, advice or consequence