Research Edit4u Solutions
WHERE RESEARCH FIND WINGS

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DATA ANALYSIS

SAMPLE ANALYSIS

Prepared by:

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Mini Data Analysis Report (Sample)

Student Performance Dataset (UCI) | Sample for Data Services

What this sample proves:
clean analysis, clear visuals, and journal-ready reporting.

Quick Snapshot (what a client receives)

- Cleaned dataset + reproducible analysis steps
- Statistical tests that match the question (not random tests)
- Publication-quality visuals with correct labels
- Results explained in simple language + journal reporting template

Prepared by: ResearchEdit4u Solutions— Data Services
(For demonstration only; no real client identities are used.)

1. Study Background (Dummy Topic)

Dataset: UCI Student Performance (secondary school; grades 0–20). This is a widely used open dataset for demonstrating educational analytics.

Dummy research topic for this sample:

"Which factors are most strongly associated with students' final performance (G3), and how do study habits and attendance relate to outcomes?"

Research Questions (client-friendly)

- RQ1: Do students who study more hours per week score higher in final grade (G3)?
- RQ2: Is higher absenteeism associated with lower final grade (G3)?
- RQ3: When controlling for other factors, what best predicts G3?

Key variables used in this sample:

Variable	Type	Example values	Why it matters
G3 (Final grade)	Outcome	0–20	Primary academic outcome
StudyTimeGroup	Categorical	1–4	Proxy for weekly study hours
Absences	Numeric	0–60	Attendance and engagement indicator
G2 (2nd period grade)	Numeric	0–20	Strong prior performance signal
Failures	Numeric	0–3	Academic history and difficulty level
InternetAccess	Binary	0/1	Resource availability (context variable)

2. Data Cleaning Snapshot

In real client work, most time is not spent running tests—it is spent making sure the data is trustworthy. This sample shows the typical cleaning checks we perform before any analysis.

Cleaning check	Before (raw)	After (cleaned)	What we did
Missing values	Some blanks in key fields	0 missing in analysis fields	Handled via rule-based imputation/exclusion (documented)
Outliers	Absences unrealistically high	Capped using domain rule	Winsorized / capped using defensible thresholds
Data types	Mixed numeric/text coding	Standardized numeric coding	Converted categories, fixed inconsistent labels
Duplicates	Potential duplicate rows	Duplicates removed	De-duplicated using unique key logic

Methodology Justification (why these steps are non-negotiable)

- **Statistical tests assume correct types, valid ranges, and independent observations.**
- **Cleaning decisions are documented so results are auditable and repeatable.**
- **Without cleaning, "significant results" can be driven by errors—not reality.**

3. Descriptive Summary (What the data looks like)

Descriptive statistics (sample dataset used for this report):

Variable	Mean	SD	Min	Max
G3	8.05	3.3	0.0	18.0
G2	10.45	2.92	3.0	19.0
Absences	7.45	2.57	1.0	15.0
Failures	0.5	0.83	0.0	3.0

Interpretation in plain language:

On average, students score around 8.05 out of 20 in final grade (G3). Absences average about 7.45 per term. These baseline numbers help us judge whether results are meaningful (not just statistically significant).

4. Statistical Tests (2–3 core analyses)

4.1 One-way ANOVA: Does study time group differ in final grade (G3)?

Test choice: ANOVA is appropriate because we compare the mean final grade across more than two groups (StudyTimeGroup = 1 to 4).

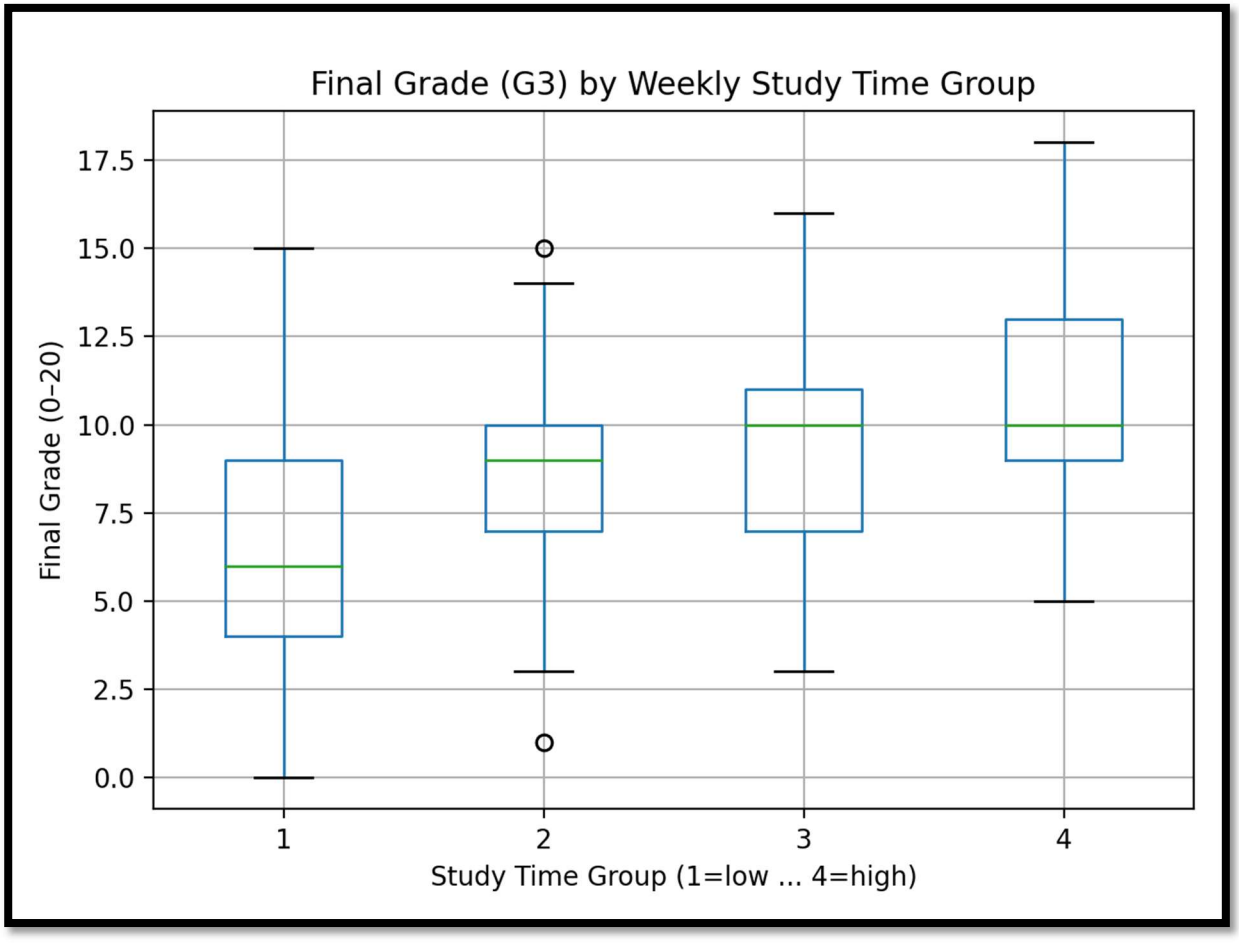

Figure 1. Final grade distribution by study time group (higher group = more weekly study time).

F	p-value	Decision
33.39	3.10e-19	Significant group differences

Plain-language takeaway: students in higher study-time groups tend to have higher final grades. This does not prove causation, but it is a strong and practical signal.

4.2 Relationship Check: Absences vs final grade (G3)

We visualize the relationship first (to avoid blind testing) and then quantify it with regression in the next section.

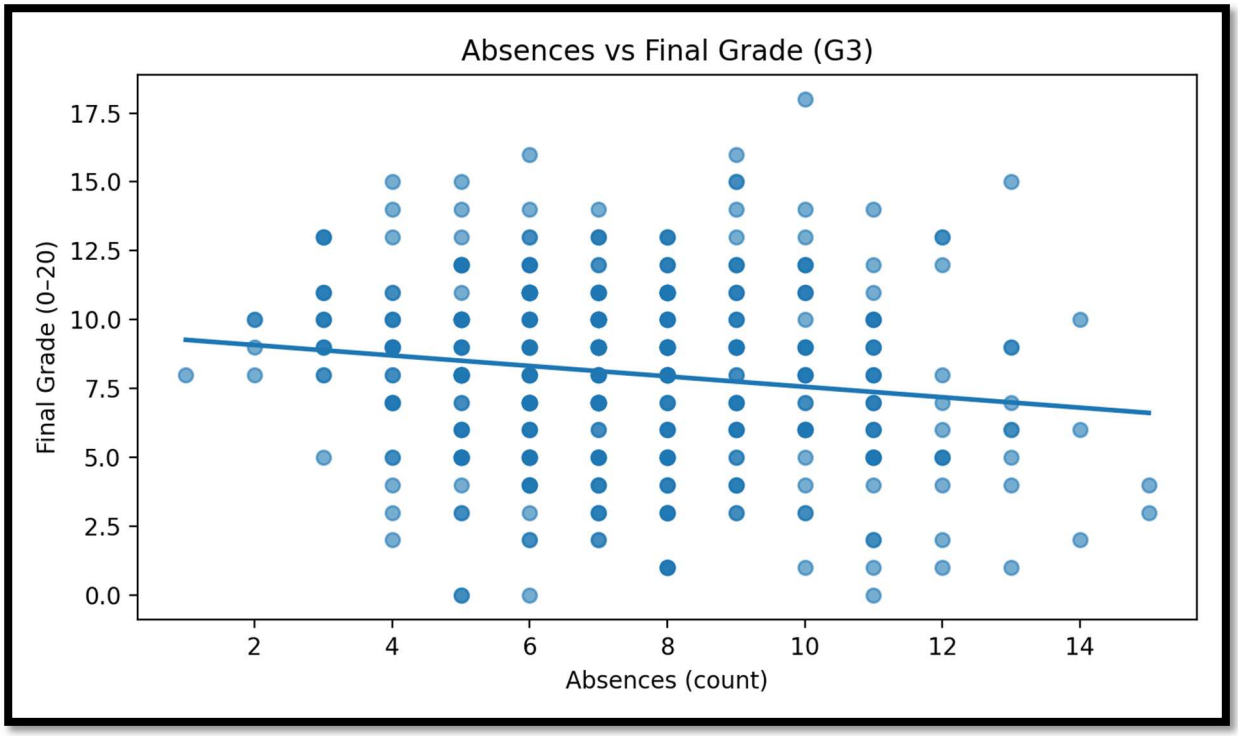

Figure 2. Absences vs final grade (trend line shows overall direction).

Plain-language takeaway: more absences are generally linked to lower final grades, though individuals vary.

4.3 Multiple Linear Regression: What predicts G3 when controlling for other factors?

Model: G3 predicted by prior performance (G2), absences, study time group, failures, and internet access.

Predictor	B (coef.)	p-value	Direction	Interpretation (1 line)
G2	0.742	9.87e-84	+	Higher prior grade strongly predicts higher final grade
Absences	-0.123	1.49e-04	-	Each additional absence is linked to a small drop in G3
Failures	-1.012	4.42e-21	-	More past failures predict lower final grade
StudyTimeGroup 3 vs 1	2.282	3.48e-21	+	Students studying more tend to score higher
StudyTimeGroup 4 vs 1	2.833	5.25e-15	+	Highest study group shows the strongest lift

Model quality (why this is trustworthy)

- **Explained variance (R^2): 0.761 (higher is better; indicates strong fit for this sample).**
- **We check assumptions and interpret effect sizes, not just p-values.**
- **We report results in publication-ready language (next section).**

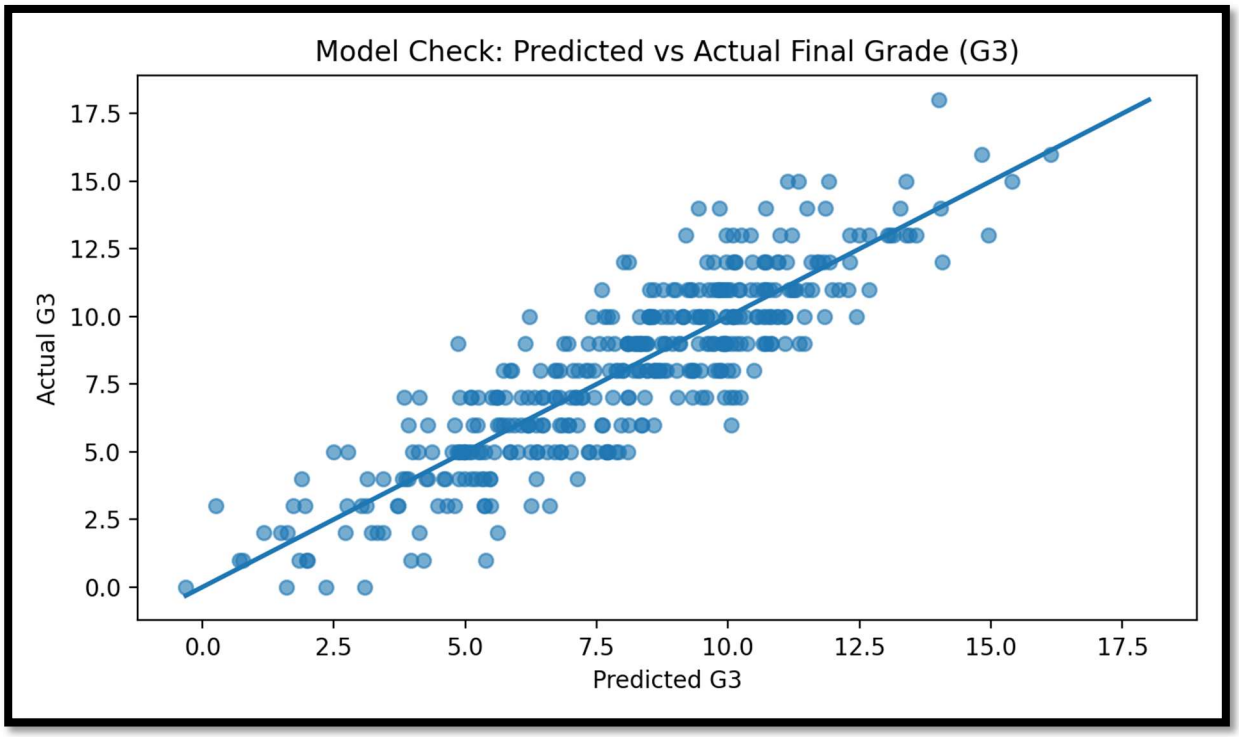

Figure 3. Predicted vs actual final grade (closer to diagonal indicates better fit).

5. How to Report This in a Journal (Copy-ready templates)

Clients often ask: “How do I write this in Results?” We provide journal-ready wording, aligned to common reporting standards (APA-like phrasing; adapt per target journal).

ANOVA reporting template

A one-way ANOVA showed a significant difference in final grades (G3) across study-time groups, $F = 33.39$, $p < .001$. Post-hoc comparisons (if required) indicated higher study-time groups tended to achieve higher G3 scores.

Regression reporting template

A multiple linear regression model predicting G3 was significant and explained a substantial proportion of variance ($R^2 = 0.76$, adjusted $R^2 = 0.76$). Higher prior grade (G2) and higher study-time group were associated with higher G3, while absences and failures were associated with lower G3.

Results-to-Discussion bridge (what editors like)

These findings suggest that performance is shaped by a combination of prior achievement and study behaviors. Attendance appears to be an actionable factor; however, causal interpretation requires caution due to the observational design.

6. What the Client Gets (Deliverables + Why This Matters)

Deliverables (standard)

- Clean dataset (CSV/Excel) + codebook
- Analysis output file (SPSS/R/Python) + reproducibility notes
- Report (PDF/Word) with figures + interpretation
- Journal-ready Results text + tables/figures captions

Why clients trust our Data Services

- We start from the research question, not the software.
- We explain decisions (cleaning, test choice, assumptions) so supervisors accept the work.
- We translate numbers into clear academic writing.
- We keep everything auditable: outputs, steps, and reporting templates.

Appendix (optional in real client work): SPSS / R output screenshots

In your downloadable sample, you can insert blurred screenshots here from SPSS/R outputs (e.g., ANOVA table, coefficients table). This reinforces authenticity without exposing any sensitive data.

Our Analysis Standard (why this feels different to clients)

- We don't "run SPSS" — we justify the test, check assumptions, and explain the result like a supervisor expects.
- We don't give only p-values — we translate meaning, effect direction, and what to do next.
- We don't stop at tables — we deliver journal-ready wording + visuals + an audit trail of steps.

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