

How to Use LaTeX and R to Write a Paper

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1 Figures

This is a section for figures. Random citation¹ embeddeed in text. Random citation² embeddeed in text.

1.1 Regression Plots

We setup variable definitions without actually evaluating them, then we put the pieces together, result shown in Figure 1.1. Random citation³ embeddeed in text.

```
> x <- 1:100
> y <- 3 + 0.25*x^(.315) + 2*x + 1.5*rnorm(x, 2, 15)
```

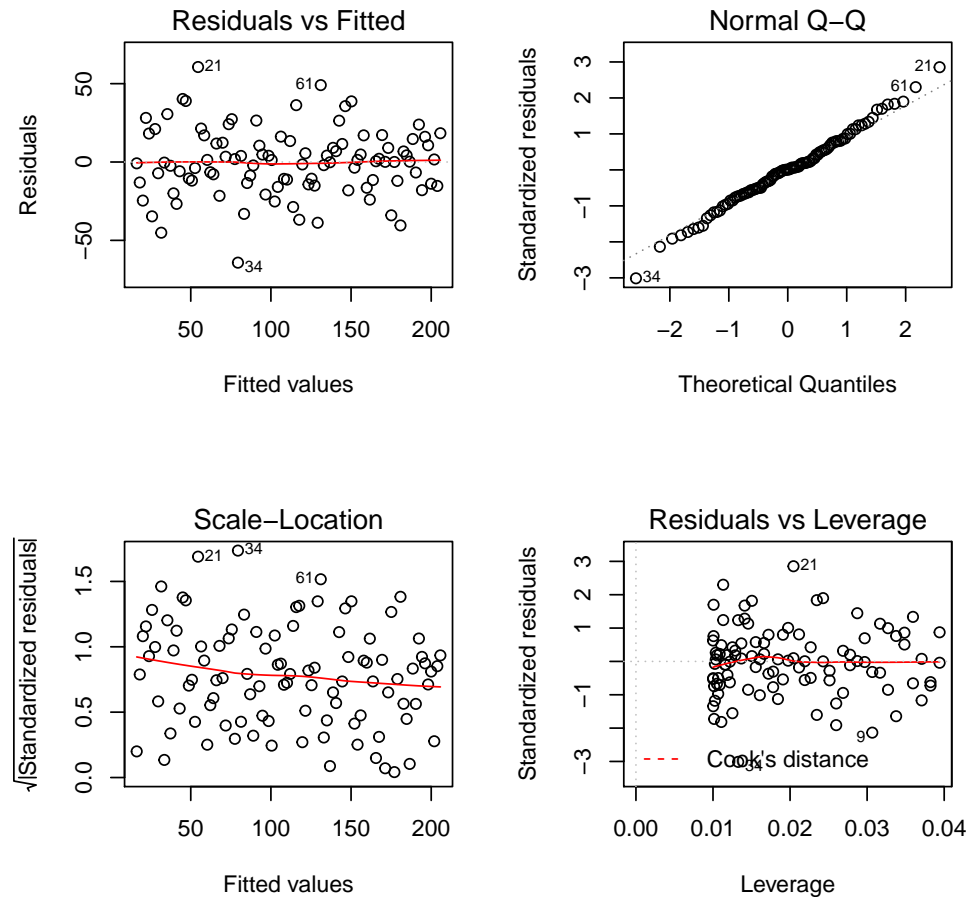


Figure 1: First Regression Plots

¹John Doe. *The Book without Title One*. Dummy Publisher First, 2100, p. 91.

²Johnston Smith. *The Book without Title Two*. Dummy Publisher Second, 2200, p. 71.

³Noah C. Li. "They All Play Minecraft". In: *Gaming Industry Analysis*. Ed. by Clara Li. Vol. 17. How It Works 07. Nothing Impossible. 12345 Buiding Road, Cedar Hills, Utah 84056: Electronics House, 2014, pp. 78 –82, p. 11.

1.2 Regression Parameters

Here is the regression result. Random citation⁴ embeddeed in text. Random citation⁵ embeddeed in text.

Call:

```
lm(formula = y ~ x)
```

Residuals:

Min	1Q	Median	3Q	Max
-64.219	-13.154	0.168	12.584	60.612

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	14.38096	4.32408	3.326	0.00124 **
x	1.91337	0.07434	25.739	< 2e-16 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 21.46 on 98 degrees of freedom

Multiple R-squared: 0.8711, Adjusted R-squared: 0.8698

F-statistic: 662.5 on 1 and 98 DF, p-value: < 2.2e-16

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	14.3810	4.3241	3.33	0.0012
x	1.9134	0.0743	25.74	0.0000

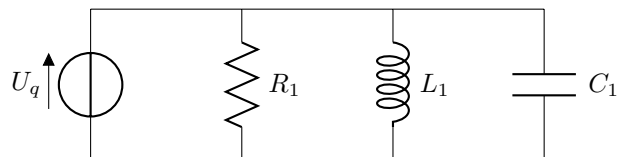
Table 1: Linear regression model for cats data.

⁴Ibid., p. 11.

⁵Clara M. Li. “The Comprehensive Animation Analysis Guide (CLARA)”. in: *DreamWorks* 14.3 (2019), pp. 123–456, p. 71.

2 Applied Circuits

Paragraph1 If there is a very simple circuit, use package "circuitikz". Random citation⁶ embeddeed in text. Random citation⁷ embeddeed in text. Random citation⁸ embeddeed in text. Random citation⁹ embeddeed in text. Random citation¹⁰ embeddeed in text.



⁶Doe, *The Book without Title One*, op. cit., p. 121.

⁷Smith, *The Book without Title Two*, op. cit., p. 47.

⁸George D. Greenwade. "The Comprehensive Tex Archive Network (CTAN)". in: *TUGBoat* 14.3 (1993), pp. 342–351, p. 47.

⁹Michel Goossens, Frank Mittelbach, and Alexander Samarin. *The LaTeX Companion*. Reading, Massachusetts: Addison-Wesley, 1993, p. 47.

¹⁰Li, "The Comprehensive Animation Analysis Guide (CLARA)", op. cit., p. 47.

3 More Figures

This is section "More Figures", shown in Figure 3. Random citation¹¹ embedded in text. Random citation¹² embedded in text. Random citation¹³ embedded in text.

```
> x <- 1:100
> y <- 3 + 0.25*x^(.315) + 2*x + 1.5*rnorm(x, 2, 15)
> par(mfrow=c(1,3))
> plot(x, y, main = "Linear Regression Plot")
> abline(lm(y~x))
> hist(y, breaks=10)
> hist(residuals(lm(y~x)), breaks=5)
```

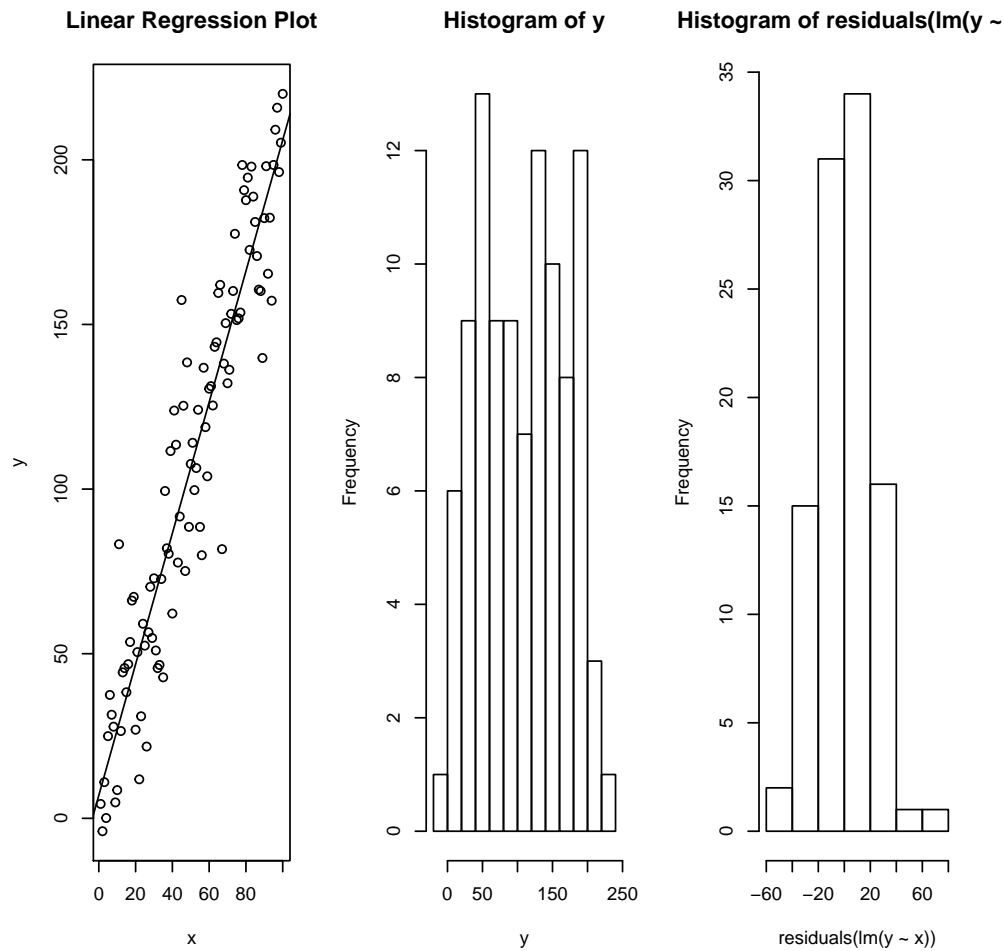


Figure 2: XY Plot and Histograms

¹¹Smith, *The Book without Title Two*, op. cit., p. 121.

¹²Greenwade, "The Comprehensive Tex Archive Network (CTAN)", op. cit., p. 47.

¹³Goossens, Mittelbach, and Samarin, *The LaTeX Companion*, op. cit., p. 47.

3.1 Part MF1

Random citation¹⁴ embeddeed in text. This formula $f(x) = x^2$ is an example. $\frac{1}{\sqrt{x}}, \left(\frac{1}{\sqrt{x}}\right)$.
 $\alpha and A, \gamma and \Gamma, \delta and \Delta \ \theta and \Theta \ \Lambda and \lambda, \forall x \in X, \quad \exists y \leq \epsilon$

$$\sum_{i=1}^{10} \sum_{j=1}^i t_{(i,j)} \\ \iiint f(x,y,z) dx dy dz \log_a b$$

the quick brown fox jumps over a lazy dog

$$f(x) = x^2 \\ g(x) = \frac{1}{x} \\ F(x) = \int_b^a \frac{y^{(.0073z_{i_j})}}{x} x^3$$

3.2 Part MF2

3.2.1 part mf2-1

$$\begin{bmatrix} 2 & 0 & 1 \\ 4 & 1 & 2 \\ 6 & 2 & 3 \end{bmatrix} \begin{bmatrix} 2 & 0 & \dots & 1 \\ 4 & 1 & \dots & 2 \\ \vdots & \vdots & \ddots & \vdots \\ 6 & 2 & \dots & 3 \end{bmatrix}$$

3.3 Subsection MF3

4 Text

This is section "Text". Random citation¹⁵ embeddeed in text. Random citation¹⁶ embeddeed in text.
 Random citation¹⁷ embeddeed in text.

4.1 Part T1 - Equations

We have write an equation her as Equation 1 and others, such as Equation 2, Equation 3, Equation 4 and Equation 5.

$$\frac{\hbar^2}{2m} \nabla^2 \psi + V \psi = E \psi. \tag{1}$$

$$VG(t) = f(T2C(t), NG(t), IGV(t)) \tag{2}$$

$$X_t = VG(t) \tag{3}$$

$$X_t = \delta + AR_1X_{t-1} + AR_2X_{t-2} + /dots + AR_pX_{t-p} + A_t - MA_1A_{t-1} - MA_2A_{t-2} - \cdots - MA_qA_{t-q} \tag{4}$$

¹⁴Smith, *The Book without Title Two*, op. cit., p. 77.
¹⁵Doe, *The Book without Title One*, op. cit., p. 47.
¹⁶Greenwade, "The Comprehensive Tex Archive Network (CTAN)", op. cit., p. 47.
¹⁷Goossens, Mittelbach, and Samarin, *The LaTeX Companion*, op. cit., p. 47.

$$p(\textit{CompressorStall}|\textit{N}_{\textit{CombinedFlights}}) = \beta_0 + \sum_p^{i=1} \beta_i * \textit{AR}_i + \sum_q^{j=1} \beta_{j+p} * \textit{MA}_j + \epsilon) \quad (5)$$

4.1.1 A Familiar Equation

if

$$ax^2 + bx + c = 0$$

then

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

4.1.2 A Simple Laplace Transform

$$\mathcal{L}\{\cos \omega t\} = \int_0^\infty e^{-st} \cos \omega t dt = \frac{e^{-st} (\omega \sin \omega t - s \cos \omega t)}{s^2 + \omega^2} \Big|_0^\infty = \frac{s}{s^2 + \omega^2}$$

4.2 Part T2

Paragraph2 Random citation¹⁸ embeddeed in text. Random citation¹⁹ embeddeed in text.

Subparagraph Random citation²⁰ embeddeed in text. Random citation²¹ embeddeed in text. Random citation²² embeddeed in text.

4.3 Illustration of ARIMA-LRM Method in My Thesis

Here is to illustrate how my ARIMA-LRM method calculate the LRM coefficients (of Equation 5) handle the ARIMA coefficients (from Equation4):

$$\begin{pmatrix} y_1 \\ y_2 \\ \vdots \\ y_m \\ y_{m+1} \\ \vdots \\ y_n \end{pmatrix} \sim \begin{pmatrix} \textit{AR}_{1_1} & \textit{AR}_{2_1} & \dots & \textit{AR}_{p_1} & \textit{MA}_{1_1} & \textit{MA}_{2_1} & \dots & \textit{MA}_{q_1} \\ \textit{AR}_{1_2} & \textit{AR}_{2_2} & \dots & \textit{AR}_{p_2} & \textit{MA}_{1_2} & \textit{MA}_{2_2} & \dots & \textit{MA}_{q_2} \\ \vdots & \vdots & \ddots & \vdots & \vdots & \vdots & \ddots & \vdots \\ \textit{AR}_{1_n} & \textit{AR}_{2_n} & \dots & \textit{AR}_{p_n} & \textit{MA}_{1_n} & \textit{MA}_{2_n} & \dots & \textit{MA}_{q_n} \end{pmatrix}$$

¹⁸Doe, *The Book without Title One*, op. cit., p. 17.

¹⁹Smith, *The Book without Title Two*, op. cit., p. 27.

²⁰Greenwade, “The Comprehensive Tex Archive Network (CTAN)”, op. cit., p. 347.

²¹Goossens, Mittelbach, and Samarin, *The LaTeX Companion*, op. cit., p. 48.

²²Li, “The Comprehensive Animation Analysis Guide (CLARA)”, op. cit., p. 48.

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References

- Doe, John. *The Book without Title One*. Dummy Publisher First, 2100.
- Goossens, Michel, Frank Mittelbach, and Alexander Samarin. *The LaTeX Companion*. Reading, Massachusetts: Addison-Wesley, 1993.
- Greenwade, George D. “The Comprehensive Tex Archive Network (CTAN)”. In: *TUGBoat* 14.3 (1993), pp. 342–351.
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- Li, Noah C. “They All Play Minecraft”. In: *Gaming Industry Analysis*. Ed. by Clara Li. Vol. 17. How It Works 07. Nothing Impossible. 12345 Buiding Road, Cedar Hills, Utah 84056: Electronics House, 2014, pp. 78 –82.
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