

# How to Use LaTeX and R to Write a Paper

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# 1 Figures

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## 1.1 Regression Plots

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

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

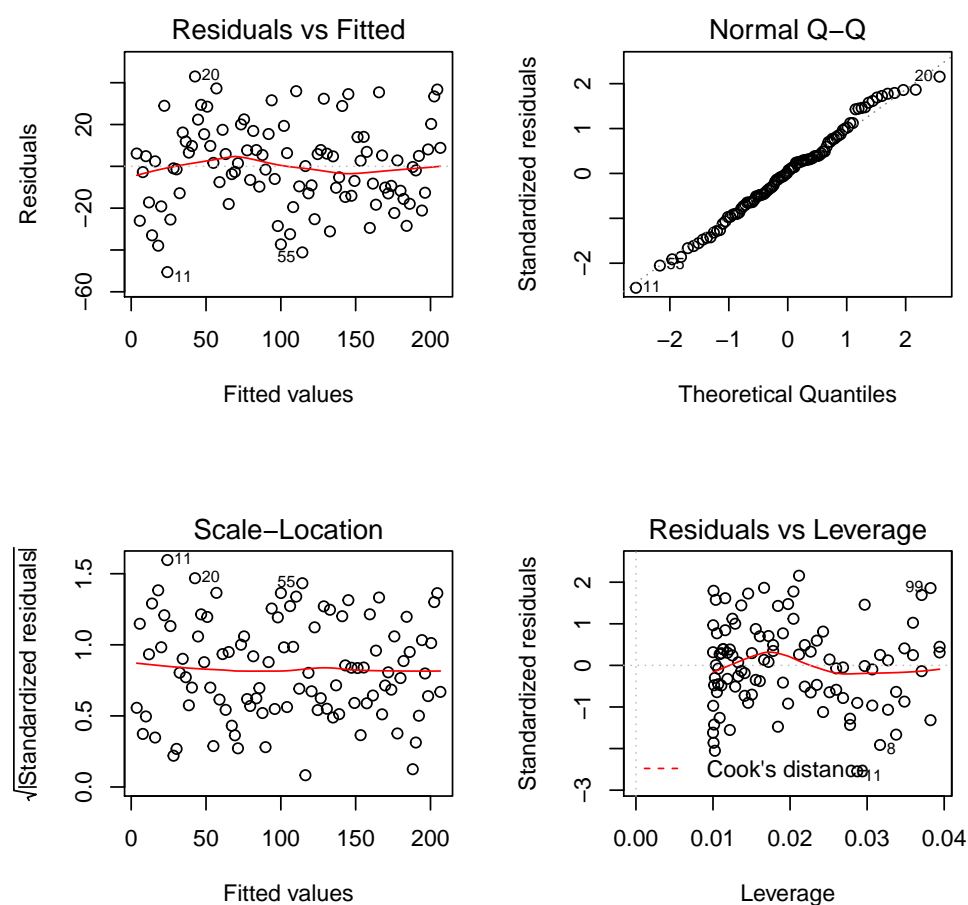


Figure 1: First Regression Plots

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

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

<sup>3</sup>George D. Greenwade. "The Comprehensive Tex Archive Network (CTAN)". in: *TUGBoat* 14.3 (1993), pp. 342–351, p. 77.

## 1.2 Regression Parameters

Here is the regression result.

Call:

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

Residuals:

Min	1Q	Median	3Q	Max
-50.590	-12.925	0.809	12.396	42.982

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	1.6357	4.0604	0.403	0.688
x	2.0497	0.0698	29.363	<2e-16 ***

---

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

Residual standard error: 20.15 on 98 degrees of freedom

Multiple R-squared: 0.8979, Adjusted R-squared: 0.8969

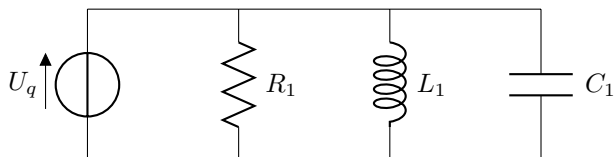
F-statistic: 862.2 on 1 and 98 DF, p-value: < 2.2e-16

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	1.6357	4.0604	0.40	0.6879
x	2.0497	0.0698	29.36	0.0000

Table 1: Linear regression model for cats data.

## 2 Applied Circuits

**Paragraph1** If there is a very simple circuit, use package "circuitikz". Random citation<sup>4</sup> embeddeed in text. Random citation<sup>5</sup> embeddeed in text. Random citation<sup>6</sup> embeddeed in text. Random citation<sup>7</sup> embeddeed in text. Random citation<sup>8</sup> embeddeed in text.




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<sup>4</sup>Doe, *The Book without Title One*, op. cit., p. 121.

<sup>5</sup>Smith, *The Book without Title Two*, op. cit., p. 47.

<sup>6</sup>Greenwade, "The Comprehensive Tex Archive Network (CTAN)", op. cit., p. 47.

<sup>7</sup>Michel Goossens, Frank Mittelbach, and Alexander Samarin. *The LaTeX Companion*. Reading, Massachusetts: Addison-Wesley, 1993, p. 47.

<sup>8</sup>"They All Went To Islands". In: *Optic Fiber Communications*. Ed. by Hood Peter, p. 47.

### 3 More Figures

Random citation<sup>9</sup> embeddeed in text. Random citation<sup>10</sup> embeddeed in text. Random citation<sup>11</sup> embeddeed in text. This is section "More Figures", shown in Figure 3.

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

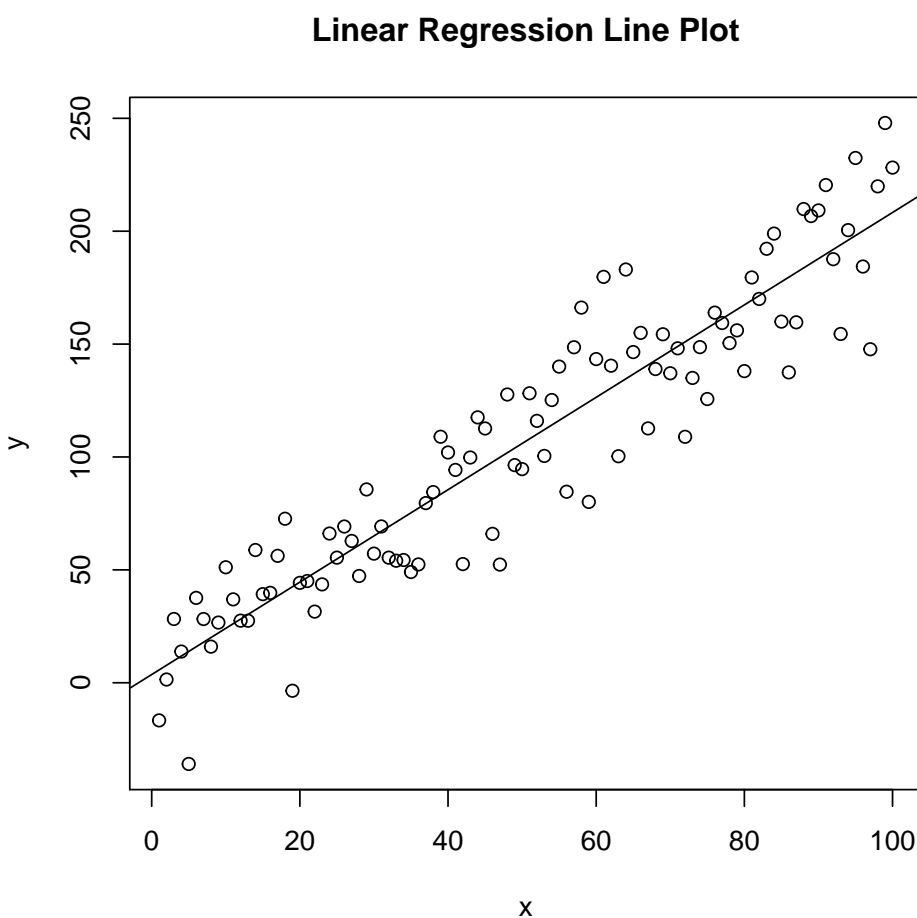


Figure 2: XY Plot

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<sup>9</sup>Smith, *The Book without Title Two*, op. cit., p. 121.

<sup>10</sup>Greenwade, "The Comprehensive Tex Archive Network (CTAN)", op. cit., p. 47.

<sup>11</sup>Goossens, Mittelbach, and Samarin, *The LaTeX Companion*, op. cit., p. 47.

### 3.1 Part MF1

Random citation<sup>12</sup> embeddeed in text. This formula  $f(x) = x^2$  is an example.  $\frac{1}{\sqrt{x}} \cdot \left(\frac{1}{\sqrt{x}}\right) \alpha and A,$   
 $\gamma and \Gamma, \delta and \Delta \ \theta and \Theta \ \Lambda and \lambda \ \forall x \in X, \ \exists y \leq \epsilon \sum_{i=1}^{10} \sum_{j=1}^i t(i,j) \ \sqrt[n]{(b^x + 4dc)}, \ \sqrt[n]{1+x+x^2+x^3+\dots}$   
 $\iiint f(x,y,z) dx dy dz \log_a b$

$$\begin{aligned} f(x) &= x^2 \\ g(x) &= \frac{1}{x} \\ F(x) &= \int_b^a \frac{y^{(.0073z)}}{x} x^3 \end{aligned}$$

### 3.2 Part MF2

#### 3.2.1 part mf2-1

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

### 3.3 Subsection MF3

## 4 Text

This is section "Text". Random citation<sup>13</sup> embeddeed in text. Random citation<sup>14</sup> embeddeed in text. Random citation<sup>15</sup> 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.

$$f(x) = x^2$$

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

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

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

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

$$p(CompressorStall|N_{CombinedFlights}) = \beta_0 + \sum_p^{i=1} \beta_i * AR_i + \sum_q^{j=1} \beta_{j+p} * MA_j + \epsilon) \tag{5}$$

<sup>12</sup>Smith, *The Book without Title Two*, op. cit., p. 77.  
<sup>13</sup>Doe, *The Book without Title One*, op. cit., p. 47.  
<sup>14</sup>Greenwade, "The Comprehensive Tex Archive Network (CTAN)", op. cit., p. 47.  
<sup>15</sup>Goossens, Mittelbach, and Samarin, *The LaTeX Companion*, op. cit., p. 47.

## 4.2 Part T2

**Paragraph2** Random citation<sup>16</sup> embeddeed in text. Random citation<sup>17</sup> embeddeed in text.

**Subparagraph** Random citation<sup>18</sup> embeddeed in text. Random citation<sup>19</sup> embeddeed in text. Random citation<sup>20</sup> 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):

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

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<sup>16</sup>Doe, *The Book without Title One*, op. cit., p. 17.

<sup>17</sup>Smith, *The Book without Title Two*, op. cit., p. 27.

<sup>18</sup>Greenwade, “The Comprehensive Tex Archive Network (CTAN)”, op. cit., p. 347.

<sup>19</sup>Goossens, Mittelbach, and Samarin, *The LaTeX Companion*, op. cit., p. 48.

<sup>20</sup>Peter, “They All Went To Islands”, 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.
- “They All Went To Islands”. In: *Optic Fiber Communications*. Ed. by Hood Peter.
- Smith, Johnston. *The Book without Title Two*. Dummy Publisher Second, 2200.