About Contact Resources Terms of Use



HOME DOWNLOAD SALES EBOOK SITE MAP

# Estimated Simple Regression Equation

If we choose the parameters a and  $\beta$  in the simple linear regression model so as to minimize the sum of squares of the error term  $\epsilon$ , we will have the so called **estimated simple** regression equation. It allows us to compute **fitted values** of y based on values of x.

$$\hat{y} = a + bx$$

### **Problem**

Apply the simple linear regression model for the data set faithful, and estimate the next eruption duration if the waiting time since the last eruption has been 80 minutes.

### Solution

We apply the Im function to a formula that describes the variable eruptions by the variable waiting, and save the linear regression model in a new variable eruption.Im.

```
> eruption.lm = lm(eruptions ~ waiting, data=faithful)
```

Then we extract the parameters of the estimated regression equation with the coefficients function.

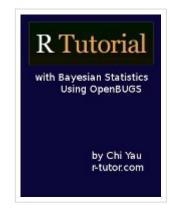
We now fit the eruption duration using the estimated regression equation.

```
> waiting = 80  # the waiting time
> duration = coeffs[1] + coeffs[2]*waiting
```

#### Search this site:

Search

## R Tutorial eBook



## R Tutorials

R Introduction

Elementary Statistics with R

Qualitative Data

Quantitative Data

Numerical Measures

Probability Distributions

Interval Estimation

```
> duration
(Intercept)
4.1762
```

## **Answer**

Based on the simple linear regression model, if the waiting time since the last eruption has been 80 minutes, we expect the next one to last 4.1762 minutes.

## **Alternative Solution**

We wrap the waiting parameter value inside a new data frame named newdata.

```
> newdata = data.frame(waiting=80) # wrap the parameter
```

Then we apply the predict function to eruption.lm along with newdata.

```
> predict(eruption.lm, newdata) # apply predict
    1
4.1762
```

<ul> <li>Simple Linear Regression</li> </ul>				up		Coefficient of Determination >	
Tags:	Elementary	Statistics with	R error ter	m	estimated	regression equation	fitted value
linear	regression	coefficients	data.frame	lm	predict	faithful	

Hypothesis Testing					
Type II Error					
Inference About Two Populations					
Goodness of Fit					
Analysis of Variance					
Non-parametric Methods					
Simple Linear Regression					
Estimated Simple					
Regression Equation					
Coefficient of					
Determination					
Significance Test for					
Linear Regression					
Confidence Interval for					
Linear Regression					
Prediction Interval for Linear Regression					
Residual Plot					
Standardized Residual					
Normal Probability Plot of Residuals					
Multiple Linear Regression					
Logistic Regression					
GPU Computing with R					

# **Recent Articles**

• Deep Learning in R

August 14, 2016

• Installing CUDA Toolkit 7.5 on Fedora 21 Linux

September 10, 2015

• Installing CUDA Toolkit 7.5 on Ubuntu 14.04 Linux

September 10, 2015

Hierarchical Linear Model
 July 22, 2013

Copyright © 2009 - 2018 Chi Yau All Rights Reserved Theme design by styleshout Fractal graphics by zyzstar Adaptation by Chi Yau