



Powerful Data Skills, Insights, and Software To Fuel Your Business Growth

[Home](#) [Business Intelligence](#) [Data Science](#) [Market Intelligence](#) [Management](#)

[Free Resources](#) [Write a Post](#)

[Home](#) / [Data Science](#) / Simple Linear Regression Examples

Simple Linear Regression Examples

Many of simple **linear regression examples** (problems and solutions) from the real life can be given to help you understand the core meaning.

From a marketing or statistical research to data analysis, linear regression model have an important role in the business.

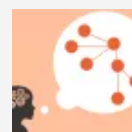
Ad ixl.com

As the simple linear regression equation explains a correlation between 2 variables (one independent and one dependent variable), it is a basis for many analyses and predictions. Apart from the business, LR is used in many

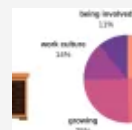
Related Posts



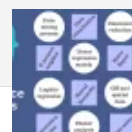
10 Key Types of Data Analysis Methods ...



5 Best Open Source Graph Databases



Categorical Data Examples and Definition



20 Data Science Topics and Areas



Qualitative vs Quantitative Data: Definitions, Analysis, Examples

other areas such as analyzing data sets in statistics, biology or machine learning projects and etc.

On this page:

- Simple linear regression examples: problems with solutions.
- Infographic in PDF

In our previous post [linear regression models](#), we explained in details what is simple and multiple linear regression. Here, we concentrate on the examples of linear regression from the real life.

Simple Linear Regression Examples, Problems, and Solutions



Let's remind that:

Simple linear regression allows us to study the correlation between only two variables:

- ⊗ One variable (X) is called independent variable or predictor.
- ⊗ The other variable (Y), is known as dependent variable or outcome.

and the simple linear regression equation is:

$$Y = B_0 + B_1X$$

Where:

X – the value of the independent variable,

Y – the value of the dependent variable.

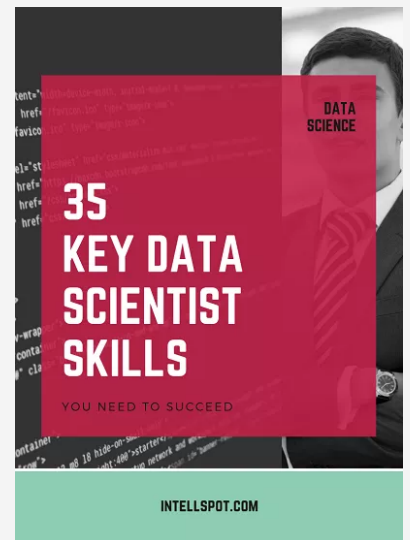
Free Download

Whitepaper For Free Download

10 COOL WAYS TO SHOW BUSINESS DATA



Free Download



Recommended Posts

35 Data Scientist Qualifications And Skills Needed To Succeed

Marketing Intelligence: Types, Definition, Examples

B0 – is a constant (shows the value of Y when the value of $X=0$)

B1 – the regression coefficient (shows how much Y changes for each unit change in X)

Example 1:

You have to study the relationship between the monthly e-commerce sales and the online advertising costs. You have the survey results for 7 online stores for the last year.

Your task is to find the equation of the straight line that fits the data best.

The following table represents the survey results from the 7 online stores.

Online Store	Monthly E-commerce Sales (in 1000 s)	Online Advertising Dollars (1000 s)
1	368	1.7
2	340	1.5
3	665	2.8
4	954	5
5	331	1.3
6	556	2.2
7	376	1.3

We can see that there is a **positive relationship** between the monthly e-commerce sales (Y) and online advertising costs (X).

20 Top Marketing Intelligence Tools: Free and Paid

Supervised vs Unsupervised Learning: Algorithms and Examples

Best Ways to Learn Machine Learning

10 Key Types of Data Analysis Methods and Techniques

Types of Graphs and Charts And Their Uses

Data Driven Decision Making: Process and Model

6 Different Types of Data Every Data Scientist Must Know

Get more stuff from intellspot.com

Subscribe to our mailing list and get interesting stuff and updates to your email inbox.

SIGN UP NOW

We respect your privacy and take protecting it seriously. We will use your emails only to send you notifications for the new posts.

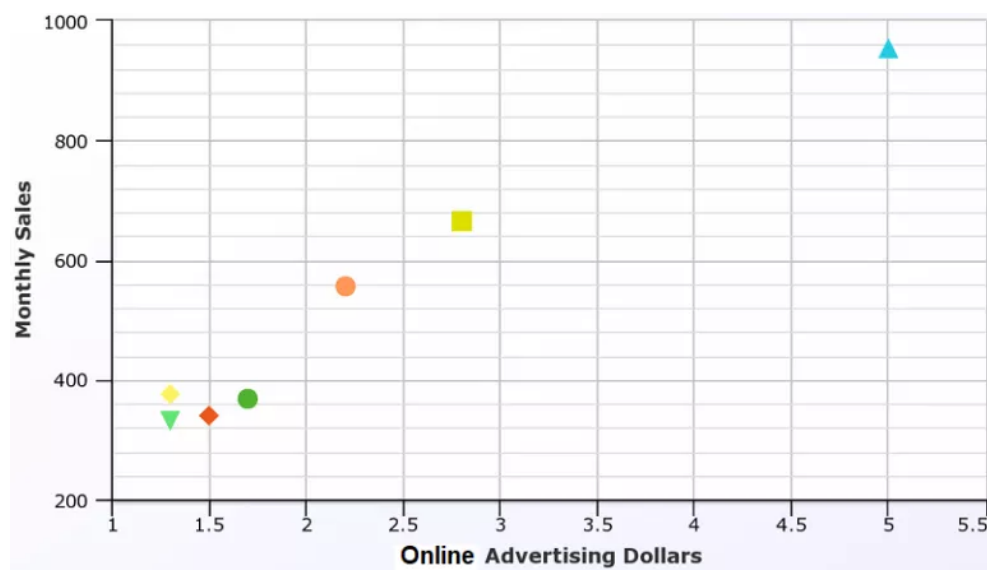
The positive correlation means that the values of the dependent variable (y) increase when the values of the independent variable (x) rise.

So, if we want to predict the monthly e-commerce sales from the online advertising costs, the higher the value of advertising costs, the higher our prediction of sales.

We will use the above data to build our Scatter diagram.

Now, let's see how **the Scatter diagram** looks like:

Diagram 1:



The Scatter plot shows how much one variable affects another. In our example, above Scatter plot shows how much online advertising costs affect the monthly e-commerce sales. It shows their correlation.

Let's see the simple linear regression equation.

$$Y = B_0 + B_1X$$

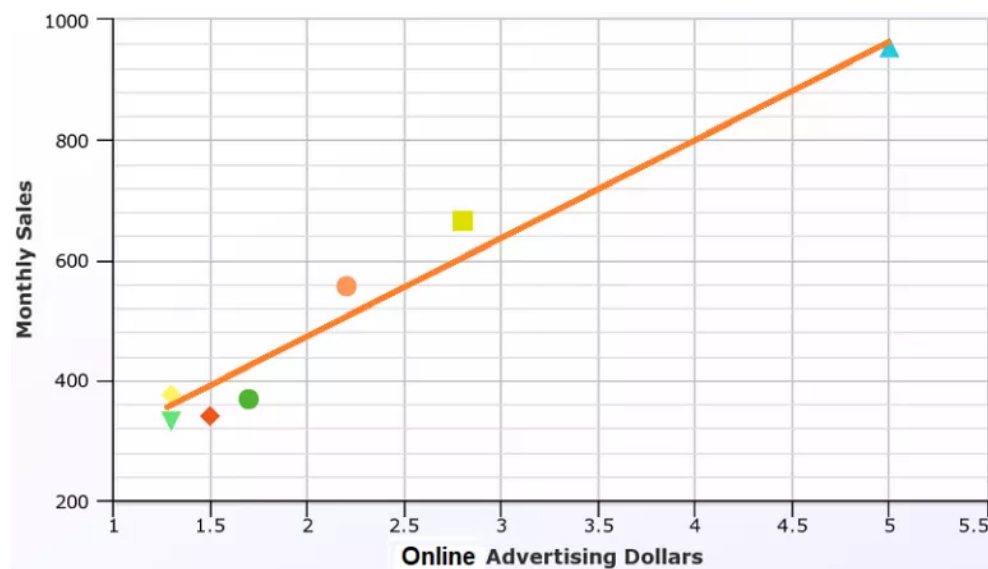
$$Y = 125.8 + 171.5 * X$$

Note: You can find easily the values for **B0** and **B1** with the help of paid or free statistical software, online linear regression calculators or Excel. All you need are the values for the independent (x) and dependent (y) variables (as those in the above table).

Now, we have to see our regression line:

Graph of the Regression Line:

Diagram 2



Linear regression aims to find the best-fitting straight line through the points. The best-fitting line is known as the regression line.

If data points are closer when plotted to making a straight line, it means the correlation between the two variables is higher. In our example, the relationship is strong.

The orange diagonal line in diagram 2 is the regression line and shows the predicted score on e-commerce sales for each possible value of the online advertising costs.

Interpretation of the results:

The slope of 171.5 shows that each increase of one unit in X, we predict the average of Y to increase by an estimated 171.5 units.

The formula estimates that for each increase of 1 dollar in online advertising costs, the expected monthly e-commerce sales are predicted to increase by \$171.5.

This was a simple linear regression example for a positive relationship in business. Let's see an example of the negative relationship.

Example 2:

You have to examine the relationship between the age and price for used cars sold in the last year by a car dealership company.

Here is the table of the data:

Car Age (in years)	Price (in dollars)
4	6300
4	5800
5	5700
5	4500
7	4500
7	4200
8	4100
9	3100

10	2100
11	2500
12	2200

Now, we see that we have a negative relationship between the car price (Y) and car age(X) – as car age increases, price decreases.

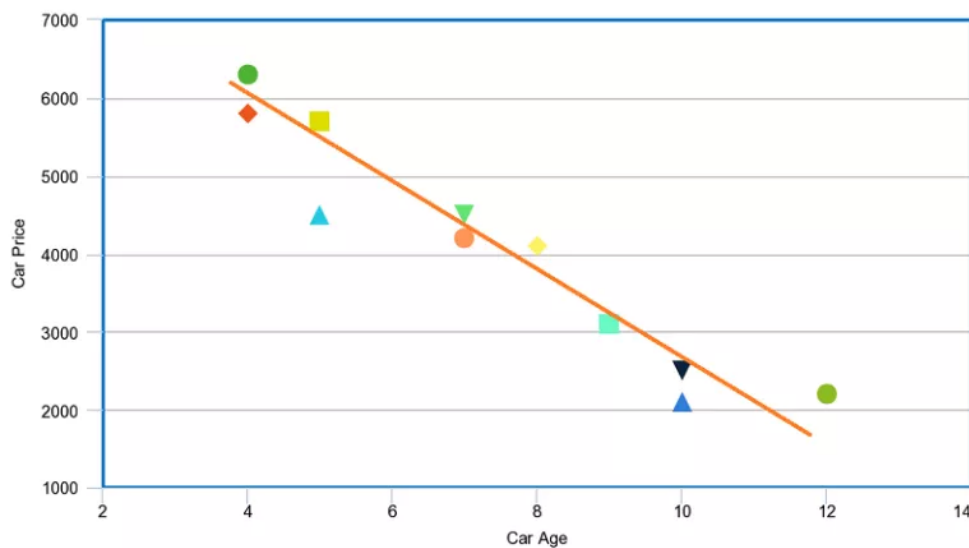
When we use the simple linear regression equation, we have the following results:

$$Y = B_0 + B_1X$$

$$Y = 7836 - 502.4 * X$$

Let's use the data from the table and create our Scatter plot and linear regression line:

Diagram 3:

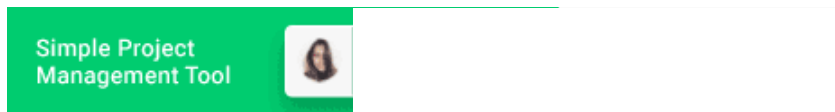


The above 3 diagrams are made with **Meta Chart**.

Result Interpretation:

With an estimated slope of -502.4 , we can conclude that the average car price decreases \$502.2 for each year a car increases in age.

The above simple linear regression examples and problems aim to help you understand better the whole idea behind simple linear regression equation.



Problem-solving using linear regression has so many applications in business, social, biological, and many many other areas.

If you need more examples in the field of statistics and data analysis, our posts “[descriptive statistics examples](#)” and “[binomial distribution examples](#)” might be useful to you.

[Download the following infographic](#) in PDF with the simple linear regression examples:

SIMPLE LINEAR REGRESSION

Example



What is simple linear regression?

Simple linear regression allows us to study the relationship between only two variables:

One variable (X) is called independent variable
The other variable (Y) is known as a dependent variable.

$$Y = B_0 + B_1X$$

X – the value of the independent variable,

Y – the value of the dependent variable.

B₀ – is a constant

(shows the value of Y when the value of X=0)

B₁ – the regression coefficient

(shows how much Y changes for each unit change in X)



Online Store	Monthly E- Commerce Sales (in 1000 s)	Online Advertising Dollars (1000 s)
1	368	1.7
2	340	1.5
3	665	2.8
4	954	5
5	331	1.3
6	556	2.2
7	376	1.3

Example :

You have to study the relationship between the monthly e-commerce sales and the online advertising costs. You have the survey results for 7 online stores for the last year.

Your task is to find the equation of the straight line that fits the data best.

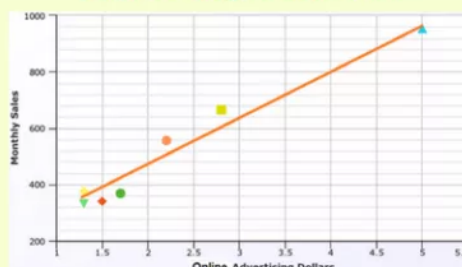
The table on the left represents the survey results from the 7 online stores.

We can see that there is a **positive relationship** between the monthly e-commerce sales (Y) and online advertising costs (X).

$$Y = 125.8 + 171.5X$$

The regression line shows the predicted score on e-commerce sales for each possible value of the online advertising

Scatter diagram
With The Regression Line:



costs.

Note: You can find easily the values for B_0 and B_1 with the help of paid or free statistical software, online linear regression calculators or Excel.



Interpretation of the results:

The formula estimates that for each increase of 1 dollar in online advertising costs, the expected monthly e-commerce sales are predicted to increase by \$171.5.

<http://intellspot.com>



Silvia Valcheva

Silvia Vylcheva has more than 10 years of experience in the digital marketing world – which gave her a wide business acumen and the ability to identify and understand different customer needs.

Silvia has a passion and knowledge in different business and marketing areas such as inbound methodology, data intelligence, competition research and more.

Related Posts



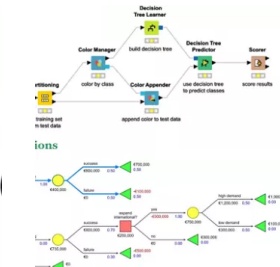
April 28, 2018

Best Ways to Learn Machine Learning



December 18, 2017

Text Mining Algorithms List



February 9, 2018

10 Open Source Decision Tree Software Tools

Leave a Reply

This site uses Akismet to reduce spam. [Learn how your comment data is processed.](#)

Message

Name

Email

Website

☐ Notify me of follow-up comments by email.

☐ Notify me of new posts by email.

Post Comment

About

Intellspot.com is a blog that aims to help you understand and use data to reveal valuable insights, improve decision making and boost innovations. Here you will find articles, lessons, insights, tools, techniques and powerful software

Menu

Home
Business Intelligence
Marketing Intelligence
Management
Free Resources

Additional Info

Privacy Policy
Contacts
Guest Posts

Get more stuff

Subscribe to our mailing list and get interesting stuff and updates to your email inbox.

Enter your email

SIGN UP NOW

solutions that help you
grow.

We respect your privacy
and take protecting it
seriously. We will use your
emails only to send you
notifications for the new
posts.

Copyright © 2018 by Business Intelligence, Data Science,
and Management.

Theme Designed by MyThemeShop.com

