Predictive Business Analytics Using Excel: Exercise 1

Carlos Gonzales is a business data scientist at a large bank located in New York City (NYC). Recently, Carlos bought a used car and is concerned about its gasoline consumption. In essence, Carlos believes that his car consumes an excessive amount of gasoline. To examine the true gasoline consumption of his car, each time Carlos fills his tank, he records the amount of gasoline (in gallons) he puts into his car along with the mileage he has driven.

Open the **Gasoline-Mileage-2.txt** file located at the Business Analytics website: www.small-big-data.com

1. Determine the equation of the estimated regression line. Based on the data, what is the intercept of this line?
A) 19
B) 20
C) 21
D) 22
E) None of the above

2. Determine the equation of the estimated regression line. Based on the data, what is the slope of this line?
A) 19
B) 20
C) 21
D) 22
E) None of the above

3. What is the expected mileage Carlos can drive with 15 gallons?
(a) 241
(b) 281
(c) 321
(d) 381
(e) None of the above

Solution

The objective of this exercise is to practice how to conduct a basic forecasting using an application software such as MS Excel.

MS Excel formulas to be used include:
=INTERCEPT()
=SLOPE()
=FORECAST()

First, you need to import the **Gasoline-Mileage-2.txt** file located at the Business Analytics website: www.small-big-data.com (depicted in Figure 1) into Excel. The file is comma delimited. The procedure of importing text files into Excel is described at:
http://www.small-big-data.com/baexcelworkshop.htm

	A	B
1	Gallons (X)	Miles (Y)
2	7.813	169
3	7.479	155.9
4	5.608	137.4
5	9.613	207.9
6	8.914	184.2
7	7.134	184
8	6.368	159.2
9	9.594	174.9
10	5.502	122.6
11	4.624	108.9
12	11.056	268.8

Figure 1.

1. After importing the data set Gasoline-Mileage-2.txt, to determine the intercept of the regression line, the INTERCEPT function needs to be used. The Gallons column is selected as X variable and in the same formula, the Miles column (as Y variable) is selected. We separate them with a comma.

Intercept	=INTERCEPT(B2:B12,A2:A12)	20.63

   The answer is C, which is 21.

2. To determine the slope of the regression line, we use the SLOPE function. The Gallons column is selected and in the same formula, the Miles column is selected. We separate them with a comma.

Slope	=SLOPE(B2:B12,A2:A12)	19.66

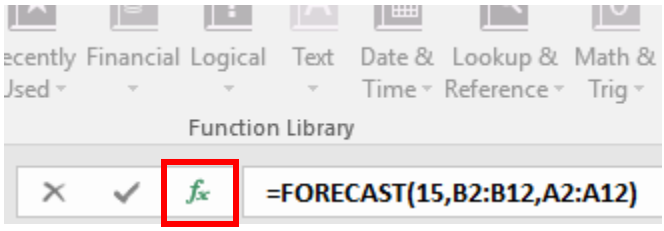
The answer is B, which is 20.

3. Expected mileage can be determined by utilizing the knowledge from the two previous questions. The regression line has the following equation: Y=a+bx, where a is INTERCEPT and b is SLOPE. In this case, when replacing the variables, it would be Y= 21+ 20*15.

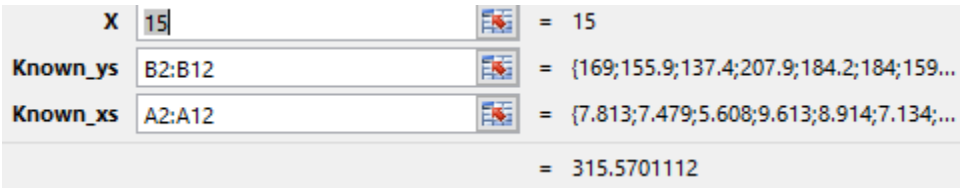
Y= 21+20*15	
=21+20*15	321

The answer is C, which is 321 gallons.

Another way to solve this problem efficiently is by utilizing the FORECAST function for linear regression. It requires the following information, =FORECAST(X, Known Ys, Known Xs). When clicking on the *Fx* icon, the function argument comes up, which can make this function easier to utilize.



Function Arguments:



After providing all this information, hit ok. The exact answer would be 315.57. This function can helps us forecast miles (Y) for any value of gallons (X)..

Answers

Exercise
1. C
2. B
3. C