TECHNOLOGY CORNER

8. Least-squares regression lines on the HP Prime

Let's use the Ford F-150 data to show how to find the equation of the least-squares regression line on the HP Prime. Here are the data again:

Miles driven	70,583	129,484	29,932	29,953	24,495	75,678	8,359	4,447
Price (in dollars)	21,994	9,500	29,875	41,995	41,995	28,986	31,891	37,991
Miles driven	34,077	58,023	44,447	68,474	144,162	140,776	29,397	131,385
Price (in dollars)	34,995	29,988	22,896	33,961	16,883	20,897	27,495	13,997

1. Press I and tap on the **Statistics 2Var** app icon. Enter the data values into the lists C1 and C2. Put the miles driven data in C1 and the price data in C2. Then make a scatterplot. Refer to the Technology Corner on page 150.

2. Define the scatterplot and regression line in the Symbolic view of the app (Press Y). Specify the settings shown below; the defaults for H1 already correspond to using C1 and C2 with a linear fit, so no changes may be needed. Tap [Fit•] to activate plotting the linear fit as well as the scatterplot. The small white dot after the label indicates that fit plotting is active in the Plot view. You can tap it again to de-activate fit plotting at any time. This toggle appears in the Plot view as well.

3. Press V and select *Autoscale* to see both the scatterplot and the linear fit. Tap to move the tracer (or use > and <). Use \ and = to move between tracing the scatterplot and tracing the fit.
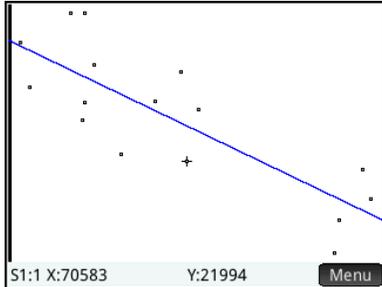
4. To find the predicted price of an F-150 truck with 100,000 miles, tap Menu and Go To . Enter 100,000 and tap OK . Tap Menu to show the tracer coordinates, indicating that an F-150 truck with 100,000 miles driven would have a price of approximately $21,965.
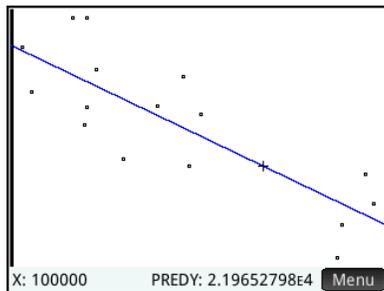
5. Press M to enter the Numeric view and tap Stats to see summary statistics related to the two data sets. The linear correlation coefficient (r) and R^2 values are shown.

X	S1		
n	16		
r	-8.15014E-1		
R²	.664247901		
sCOV	-3.734404E8		
σCOV	-3.501004E8		
ΣXY	2.28910E10		

-.815014049572

Tap OK to return to the Numeric view when you are done.

6. Press Y to enter the Symbolic view. The linear regression equation is shown in **Fit1**.

Statistics 2Var Symbolic View
√ S1: C1   C2
Type1: Linear
Fit1: -.162918553062*X+38257.1350657
S2:
Type2: Linear
Fit2: M*X+B
S3:
Enter function

7. You can use the linear fit to make predictions from the Home view using the PredX and PredY commands. To repeat the previous calculation of the price of an F-150 with 100,000 miles, go to the Home view. Press D , tap App , tap Statistic 2Var, and select PredY.

Statistics 2Var
App Functions
Statistics 2Var   →   1 PredX
Function   →   2 PredY
TC3-1   →   3 Resid
TC1-3   →   4 Do2VStats
TC2-2   →   5 SetDepend
ROSE_4_Chaoyang   →   6 SetIndep
TC2-2B   →   7 CHECK
DataStreamer   →   8 UNCHECK
                      9 ISCHECK
Math CAS App   Catlg OK

8. Complete the command PREDY(100,000) and press E .

Statistics 2Var
PredY(100000)   21965.2797595
Sto ▸

9. Save these lists for later use. In the Home view, enter C1▸MILES and C2▸PRICE. You will be prompted to confirm that you want to create these new variables. Simply tap OK to proceed.

Statistics 2Var
Do you want to create a variable called MILES
C1▸MILES
Cancel   OK

Statistics 2Var
C1▸MILES
{70583,129484,29932,29953,24495,75678,8359,▸
C2▸PRICE
{21994,9500,29875,41995,41995,28986,31891,3▸
Sto ▸