

Chapter 14 / Example 4

Test for the product moment correlation coefficient

The number of times students are late for school and the distance they live from school is thought to be related. A sample of eight students is selected randomly and the data for the previous six weeks is checked. The following results were obtained.

| Distance from school (km) | Number of times late | Distance from school (km) | Number of times late |
|---------------------------|----------------------|---------------------------|----------------------|
| 5.2 | 5 | 2.3 | 1 |
| 1.4 | 2 | 2.8 | 3 |
| 6.7 | 0 | 7.0 | 2 |
| 8.8 | 6 | 0.5 | 0 |

Test at the 5% level whether there is a linear relationship between the two variables.

$$H_0: \rho = 0, H_1: \rho \neq 0$$

Press **STAT** 1:Edit and press **ENTER**

Type the distances in the first column.

Press **ENTER** or **▼** after each number to move to the next cell.

Note: If the list contains other numbers, you can clear it by pressing **[STAT]** 4:ClrList and press **[ENTER]**. The home screen displays ClrList. Press **[2nd]** **[1]** **[L1]** and press **[ENTER]**. Press **[STAT]** 1:Edit and press **[ENTER]** to return to the table.

| L1 | L2 | L3 | L4 | L5 | L6 |
|-------|-------|-------|-------|-------|----|
| 5.2 | ----- | ----- | ----- | ----- | |
| 1.4 | | | | | |
| 6.7 | | | | | |
| 8.8 | | | | | |
| 2.3 | | | | | |
| 2.8 | | | | | |
| 7 | | | | | |
| .5 | | | | | |
| ----- | | | | | |
| | | | | | |

L1(9)=

Press to move to the next column.

Enter the number of times in the second column.

| L1 | L2 | L3 | L4 | L5 | 2 |
|-------|-------|-------|-------|-------|---|
| 5.2 | 5 | ----- | ----- | ----- | |
| 1.4 | 2 | | | | |
| 6.7 | 0 | | | | |
| 8.8 | 6 | | | | |
| 2.3 | 1 | | | | |
| 2.8 | 3 | | | | |
| 7 | 2 | | | | |
| .5 | 0 | | | | |
| ----- | ----- | | | | |

L2(9)=

Before calculating a correlation coefficient, you must switch this option on.

Press **MODE**

Using and , navigate down to STAT DIAGNOSTICS and select 'ON' by pressing .

MATHPRINT CLASSIC
NORMAL SCI ENG
FLOAT 0 1 2 3 4 5 6 7 8 9
RADIAN DEGREE
FUNCTION PARAMETRIC POLAR SEQ
THICK DOT-THICK THIN DOT-THIN
SEQUENTIAL SIMUL
REAL $a+bi$ $r\angle\theta(i)$
FULL HORIZONTAL GRAPH-TABLE
FRACTION-TYPE: $\frac{a}{b}$ Uned
ANSWERS: AUTO DEC FRAC-APPROX
GO TO 2ND FORMAT GRAPH: NO YES
STAT DIAGNOSTICS: OFF ON
STAT WIZARDS: ON OFF
SET CLOCK 11/20/18 12:30PM

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Test for the product moment correlation coefficient

Press **[STAT]** **[▶]** **[▶]** F:LinRegTTest and press **[ENTER]**

Set β & ρ to $\neq 0$, leave all other items the same and navigate down to Calculate.

Press **[ENTER]**.

```

LinRegTTest
Xlist:L1
Ylist:L2
Freq:1
 $\beta$  &  $\rho$ : $\neq 0$  <0 >0
RegEQ:
Calculate
  
```

The p -value is 0.190.

$0.190 > 0.05$ hence no reason to reject the null hypothesis.

```

LinRegTTest
y=a+bx
 $\beta \neq 0$  and  $\rho \neq 0$ 
t=1.476599155
p=.1902451191
df=6
a=.7355366997
b=.3779742479
s=2.034950456
  
```