

(8) *Blood Pressure Measurements* Fourteen different second-year medical students took blood pressure measurements of the same patient and the results are listed below (data provided by Marc Triola, MD).

Systolic	138	130	135	140	120	125	120	130	130	144	143	140	130	150
Diastolic	82	91	100	100	80	90	80	80	80	98	105	85	70	100

Find the: (a) explained variation (b) unexplained variation (c) total variation
 (d) coefficient of determination (r^2) (e) standard error of estimate (s_e).
 (Assume that there is significant linear correlation.)

Enter your data into L1 and L2

then do **E:LinRegTTest...**

L1	L2	L3	Z
138	80		
130	91		
135	100		
140	100		
120	80		
125	90		
120	80		
130	80		
130	80		
144	98		
143	105		
140	85		
130	70		
150	100		

Calculate the total variation $\sum (y - \bar{y})^2$

Cursor on L3

L1	L2	L3	Z
138	82		
130	91		
135	100		
140	100		
120	80		
125	90		
120	80		

L1	L2	L3	Z
138	82	44.444	
130	91	5.5561	
135	100	128.98	
140	100	128.98	
120	80	74.699	
125	90	1.8418	
120	80	74.699	

LIST	MATH	5:Sum(
SUM(L3)		
1453.214286		
Ans→T		

Total Variation ≈ 1453.214286

Store in T

Calculate the Explained Variation:

$$r^2 = \frac{\text{Explained Variation}}{\text{Total Variation}} \Rightarrow \text{Explained Variation} = r^2 \cdot \text{Total Variation}$$

$r^2 * T$	628.9602705
Ans→E	

Store in E

Calculate the Unexplained Variation:

$$\text{Unexplained Variation} = \text{Total Variation} - \text{Explained Variation}$$

T-E	824.2540152
Ans→U	

Store in U

ANSWERS

- (a) Explained variation is stored in E
- (b) Unexplained variation is stored in U
- (c) Total variation is stored in T
- (d) Coefficient of determination
- (e) Standard error of estimate

$$\text{Explained Variation} \approx 628.96027$$

$$\text{Unexplained Variation} \approx 824.25402$$

$$\text{Total Variation} \approx 1453.2143$$

$$r^2 \approx 0.43280628$$

$$s_e \approx 8.287812413$$

VAR	5:Statistics	EQ	8: r^2
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VAR	5:Statistics	TEST	0: s_e
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