

CIMT Statistics p236 Ex 12D no. 3, 4

3.

$$S_{TT} = \sum T_i^2 - \frac{(\sum T_i)^2}{n} = 3238.2 - \frac{402.0^2}{50} = 6.12$$

$$S_{TH} = \sum T_i H_i - \frac{\sum T_i \sum H_i}{n} = 680.2 - \frac{402.0 \times 83.4}{50} = 9.664$$

$$b = \frac{S_{TH}}{S_{TT}} = \frac{9.664}{6.12} \approx 1.57908$$

$$\bar{H} = \frac{\sum H_i}{n} = \frac{83.4}{50} \approx 1.668$$

$$\bar{T} = \frac{\sum T_i}{n} = \frac{402.0}{50} \approx 8.04$$

$$a = \bar{H} - b\bar{T} = 1.668 - 1.57908 \times 8.04 \approx -11.0278$$

$$\text{so } H = -11.0278 + 1.57908 \times T$$

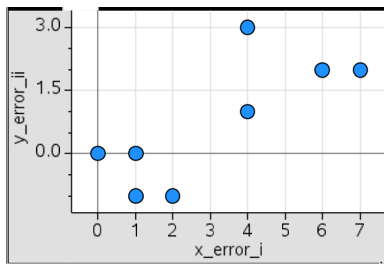
$$H(7.8) = -11.0278 + 1.57908 \times 7.8$$

$$= 1.28902$$

$$\approx 1.3 \text{ (1dp)}$$

$stt = 3238.2 - \frac{402^2}{50}$	6.12
$sth = 680.2 - \frac{402 \cdot 83.4}{50}$	9.664
$b = \frac{sth}{stt}$	1.57908
$h_bar = \frac{83.4}{50}$	1.668
$t_bar = \frac{402}{50}$	8.04
$h_bar - b \cdot t_bar$	-11.0278
$-11.0278 + 1.57908 \cdot 7.8$	1.28902

4.



Scatterplot is possibly linear!

t-test on ρ (below) rejects H_0 at 5% level, so we boldly proceed...without any further analysis!

Regression of y on x:

LinRegBx x_error_i,y_error_ii,1: CopyVar s	
"Title"	"Linear Regression (a+bx)"
"RegEqn"	"a+b · x"
"a"	-0.660167
"b"	0.451253
"r²"	0.589541
"r"	0.767816
"Resid"	"{...}"
"so y = -0.660167 + 0.451253x"	
"so y = -0.660167 + 0.451253x"	
r(5)	1.5961

Regression of x on y:

LinRegBx y_error_ii,x_error_i,1: CopyVar s	
"Title"	"Linear Regression (a+bx)"
"RegEqn"	"a+b · x"
"a"	2.14516
"b"	1.30645
"r²"	0.589541
"r"	0.767816
"Resid"	"{...}"
"so x = 2.14516 + 1.30645y"	
"so x = 2.14516 + 1.30645y"	
r(1)	3.45161

LinRegtTest x_error_i,y_error_ii,1,0: CopyVar s	
"Title"	"Linear Reg t Test"
"Alternate Hyp"	"β & ρ ≠ 0"
"RegEqn"	"a+b · x"
"t"	2.9356
"PVal"	0.026096
"df"	6
"a"	-0.660167
"b"	0.451253
"s"	1.02973
"SESlope"	0.153717
"r²"	0.589541
"r"	0.767816
"Resid"	"{...}"