

## Quiz 3

### Exercises

Please use this dataset.

x	y
1	2
2	4
3	5
4	4
5	6
6	7

#### Exercise 1.

Does the data provide sufficient evidence to indicate that  $x$  and  $y$  are significantly related? Use  $\alpha = 0.05$ .

#### Solution:

```
x <- c(1,2,3,4,5,6)
y <- c(2,4,5,4,6,7)
model <- lm(y~x)
summary(model)
```

Call:

```
lm(formula = y ~ x)
```

Residuals:

1	2	3	4	5	6
-0.52381	0.61905	0.76190	-1.09524	0.04762	0.19048

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	1.6667	0.7325	2.275	0.0852 .
x	0.8571	0.1881	4.557	0.0104 *

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Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.7868 on 4 degrees of freedom

Multiple R-squared: 0.8385, Adjusted R-squared: 0.7981

F-statistic: 20.77 on 1 and 4 DF, p-value: 0.01036

Since  $p\text{-value} < 0.05$ , there is sufficient evidence to indicate that  $x$  and  $y$  are related.

### Exercise 2.

Find a 95% confidence interval for the slope,  $\beta_1$ . Interpret the result practically.

**Solution:**

```
confint(model, level=0.95)['x',]
```

```
      2.5 %      97.5 %  
0.3349486 1.3793371
```