

# TESTING CORRELATION

TEXT:

LAST NAME	FIRST NAME	DATE
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1 (6 points). Are butterflies' lifespans linearly correlated with their wingspans? The wingspan (in mm) and the lifespan in the adult state (in days) were measured for 11 species of butterfly.

wingspan	35	30	30	32	23	27	28	25	31	23	26
lifespan	19	17	27	22	40	18	25	32	27	31	37

Conduct an appropriate test at 10% significance level.

- (a)  $H_0$  :  $H_1$  :
- (b) State the distribution of the test statistic:
- (c) Sketch a graph of the distribution of the test statistic, find and label the critical value(s), shade the rejection region.
- (d) Compute the test statistic and sketch it on the graph above.
- (e) Find the  $p$ -value of the test.
- (f) State the conclusion.

2 (6 points). Is the number of pages in a book positively correlated with the number of pictures in the same book? Use the following sample data to run a corresponding test at  $\alpha = 0.02$ .

# of pages	311	214	89	75	650	14	123	287
# of pictures	4	10	2	5	24	10	2	17

- (a)  $H_0$  :  $H_1$  :
- (b) Find the point estimate(s) for the population parameter(s).
- (c) Find the  $p$ -value of the test.
- (d) State the conclusion.

3. Use the data above to run a classical test by hand: sketch the distribution of the test statistic, the critical value(s), the rejection region, and the test statistic itself.