

Answer on Question #55207 – Math – Statistics and Probability

Wildlife researchers monitor many wildlife populations by taking aerial photographs. Can they estimate the weight of alligators accurately from the air?

dependent variable is weight

$R^2 = 83.6\%$

$s = 54.01$

intercept(variable) -393(coefficient) 47.53(SE Coeff) -8.27(T ratio) <0.0001(p value)

Length(variable) 5.9(coefficient) 0.5448(SE Coeff) 10.8 (t ratio) <0.0001 (p value)

- a) did they chose the correct variable to use as the dependent variable and the predictor? explain
- b) what is the correlation between an alligators length and weight
- c) write the regression equation
- d) interpret the slope of the equation in this context

Solution

a) Weight is the proper dependent variable. The researchers can estimate length from the air, and use length to predict weight.

b) The correlation between an alligator's length and weight is

$$r = \pm\sqrt{r^2} = \pm\sqrt{0.836} = \pm 0.914$$

Since length and weight are positively associated, the correlation is $r = 0.914$.

c) The linear regression model that predicts and alligator's weight from its length is

$$\text{Weight} = -393 + 5.9(\text{Length}).$$

d) For each additional inch in length, the model predicts an increase of 5.9 pounds in weight.