

Concept 4: Interpreting Computer Regression Output

As noted already, we will often rely on technology to generate the equation of the least-squares regression line. You are probably familiar with using your calculator to produce the equation. Make sure you can also interpret computer output to identify the slope and intercept of the regression line as well as other important values such as correlation and the coefficient of determination. There is a strong possibility you will need to read computer output on the AP Exam!

Check for Understanding: ____ I can construct or identify the equation of a least squares regression line.

A study was performed to determine the effect of temperature on a pond's algae level. Temperature was measured in degrees F, and algae level was measured in parts per million. Consider the computer output below.

Predictor	Coef	Stdev	t-ratio	p
Constant	42.8477	5.750	7.44	0.000
Temp	0.47620	0.5911	0.806	0.000

s = 0.4224 R-sq= 91.7% R-sq(adj)=91.2%

1) Write the equation of the least squares regression line. Identify any variables used.

$\hat{y} = 42.8477 + 0.47620x$

$\widehat{\text{predicted algae level}} = 42.8477 + 0.47620(\text{Temp})$

2) Interpret the slope of the least-squares regression line.

For each additional degree F, we predict about 0.47620 more parts per million of algae level.

3) Identify and interpret the correlation coefficient.

Since $r^2 = 91.7\%$ $r = .9576$

There is a strong, positive linear relationship between a ponds algae level and temperature.

4) Identify and interpret the standard deviation of the residuals.

$S = 0.4224$

The average amount that the observed values differ from the predicted values is 0.4224

The average amount ~~that~~ ^{of} the observed algae level differ from the predicted by approximately 0.4224 units !!