Polynomial Regression

Analysis of Hooker data using Quadratic Regression

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.999(a)	.998	.998	.3956

a Predictors: (Constant), Pressure Squared, Pressure

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2286.933	2	1143.467	7306.975	.000(a)
	Residual	4.382	28	.156		
	Total	2291.315	30			

a Predictors: (Constant), Pressure Squared, Pressure
b Dependent Variable: Boiling point of Water (C)

ANOVA Test comparing the two models

H0 : E[Y] = beta0
Ha : E[Y] = beta0 + beta1.x + beta2.x^2

Here the result is highly significant, which implies that the model given by Ha provides a significantly better fit than the model given by H0.

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	126.702	2.112		59.981	.000	122.375	131.029
	Pressure	4.158	.199	1.838	20.885	.000	3.750	4.565
	Pressure Squared	-.044	.005	-.846	-9.612	.000	-.053	-.034

a Dependent Variable: Boiling point of Water (C)

Estimates from Quadratic Regression Model.

The p-values are all < 0.001, so each beta coefficient is significantly different from zero.