

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
 $H_0 : E[Y] = \beta_0$
 $H_a : E[Y] = \beta_0 + \beta_1 x + \beta_2 x^2$

Here the result is highly significant, which implies that the model given by H_a provides a significantly better fit than the model given by H_0 .

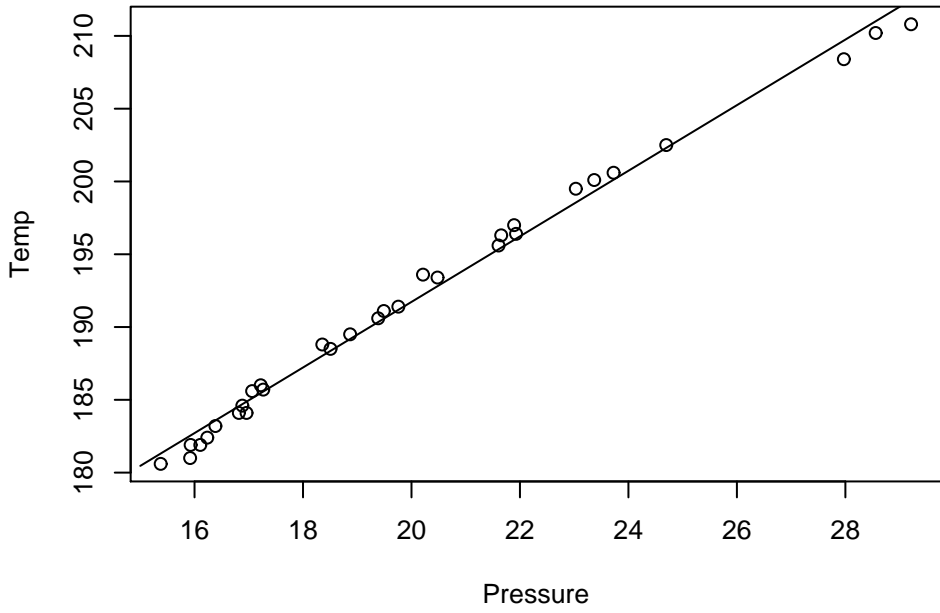
Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients		95% Confidence Interval for B		
		B	Std. Error	Beta	t	Sig.	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

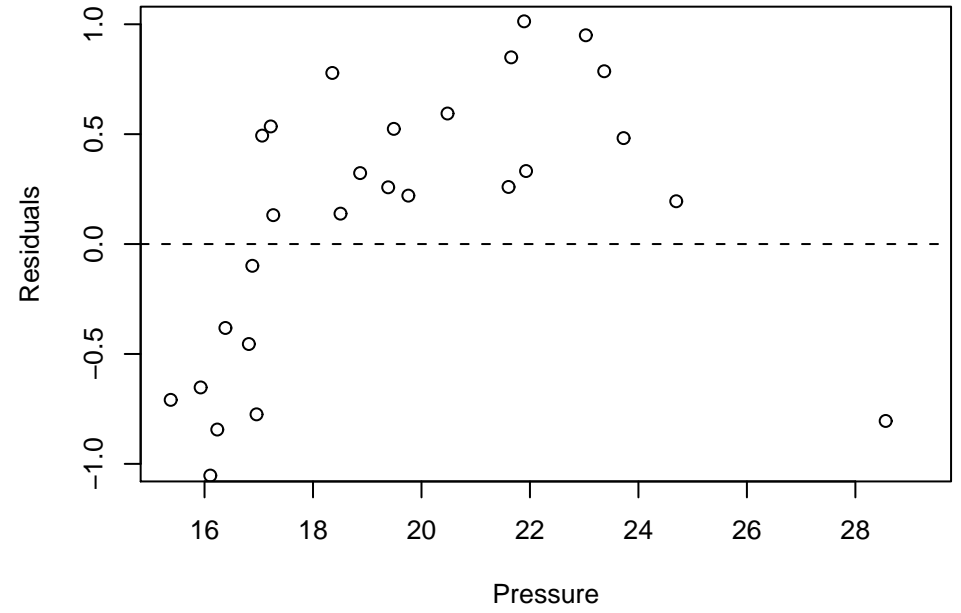
a Dependent Variable: Boiling point of Water (C)

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

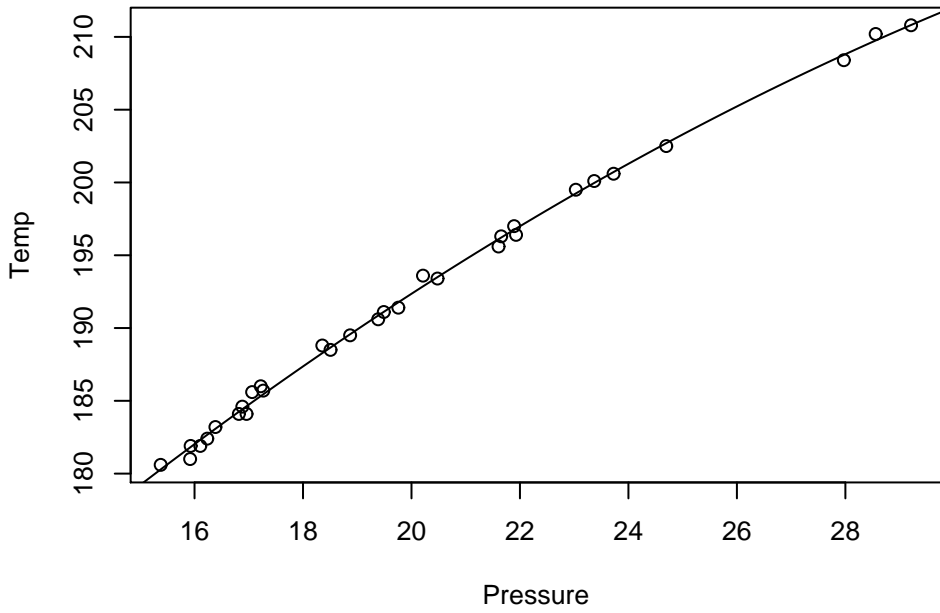
Hooker Data: Simple Linear Regression



Hooker Data: Linear Regression Residuals



Hooker Data: Quadratic Regression



Hooker Data: Quadratic Regression Residuals

