SAS Output for Question 1 (page 1 of 2)

The REG Procedure
Model: linear
Dependent Variable: yield

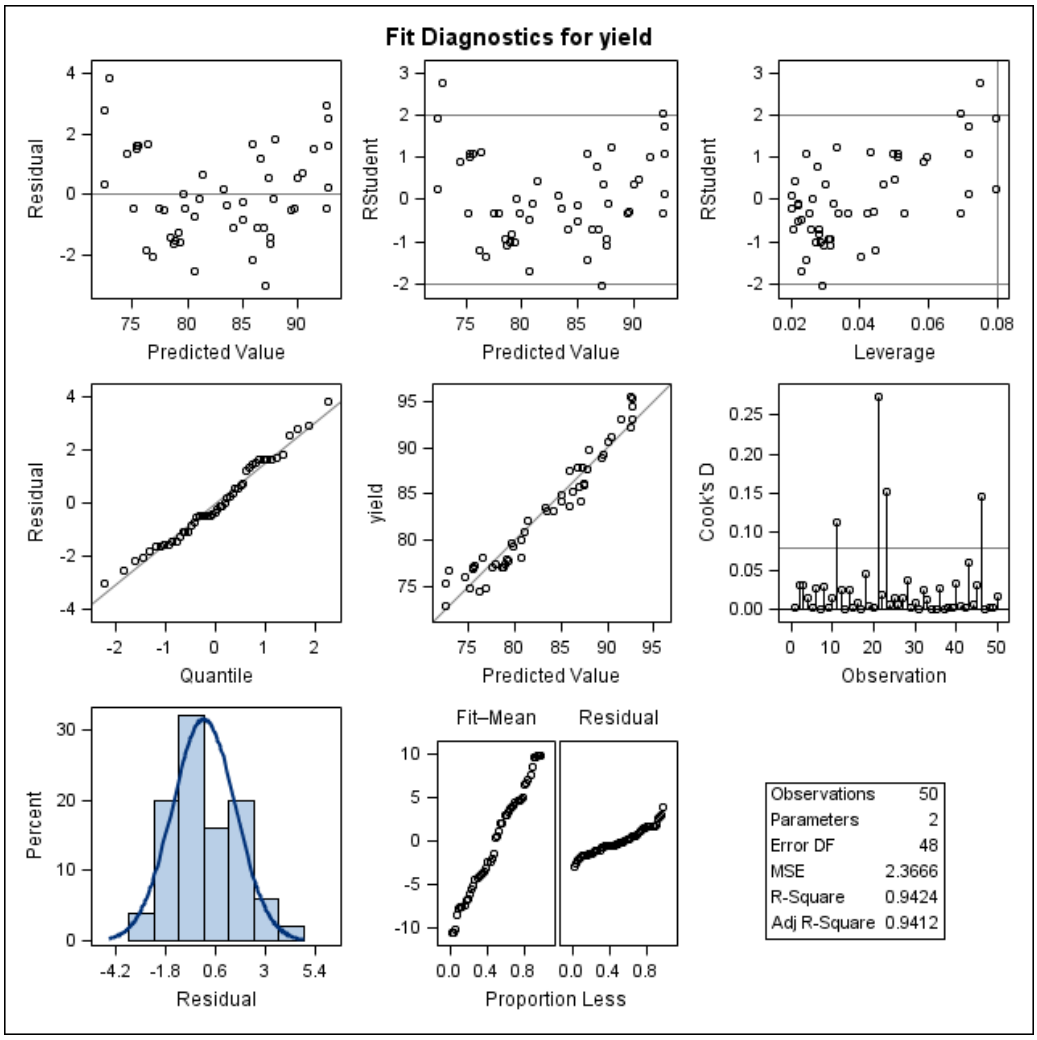
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	1859.39649	1859.39649	785.70	<.0001
Error	48	113.59471	2.36656		
Corrected Total	49	1972.99120			

Root MSE	1.53836	R-Square	0.9424
Dependent Mean	82.97600	Adj R-Sq	0.9412
Coeff Var	1.85398		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	51.26492	1.15204	44.50	<.0001
temperature	1	0.20965	0.00748	28.03	<.0001



SAS Output for Question 1 (page 2 of 2)

The REG Procedure
Model: quadratic
Dependent Variable: yield

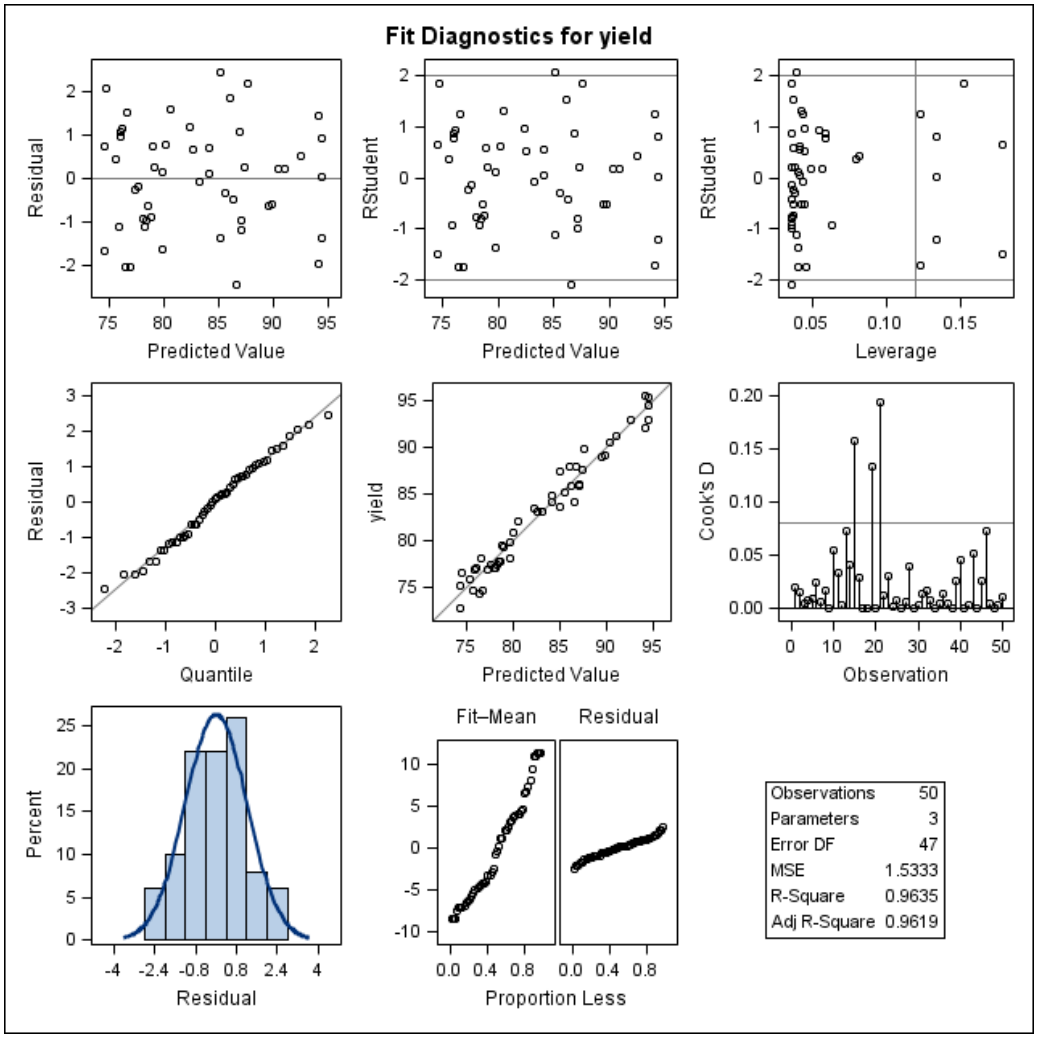
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	1900.92636	950.46318	619.88	<.0001
Error	47	72.06484	1.53329		
Corrected Total	49	1972.99120			

Root MSE	1.23826	R-Square	0.9635
Dependent Mean	82.97600	Adj R-Sq	0.9619
Coeff Var	1.49231		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	77.72933	5.16891	15.04	<.0001
temperature	1	-0.15359	0.07005	-2.19	0.0333
temp_sq	1	0.00120	0.00023064	5.20	<.0001



SAS Output for Question 2 (page 1 of 1)

```
title "Mussels";
data mussels;
input location $ age weight @@;
datalines;
A  3  0.44   A  3  0.50   A  3  0.66   A  3  0.78
  . . . more data goes here . . .
;

proc glm data=mussels;
class location;
model weight = location age location*age / solution;
run;
```

The GLM Procedure

Dependent Variable: weight

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	581.7924354	116.3584871	134.22	<.0001
Error	81	70.2191255	0.8669028		
Corrected Total	86	652.0115609			

R-Square	Coeff Var	Root MSE	weight Mean
0.892304	21.72669	0.931076	4.285402

Source	DF	Type III SS	Mean Square	F Value	Pr > F
location	2	1.1045181	0.5522591	0.64	0.5315
age	1	379.9989681	379.9989681	438.34	<.0001
age*location	2	41.8750322	20.9375161	24.15	<.0001

Parameter		Estimate	Standard Error	t Value	Pr > |t|
Intercept		-.8613785264 B	0.72781126	-1.18	0.2401
location	A	0.3785510112 B	0.82215746	0.46	0.6464
location	B	-.2135597061 B	0.81253397	-0.26	0.7933
location	C	0.0000000000 B	.	.	.
age		0.3430556991 B	0.04439419	7.73	<.0001
age*location	A	0.0218845368 B	0.05631812	0.39	0.6986
age*location	B	0.3060320424 B	0.05477758	5.59	<.0001
age*location	C	0.0000000000 B	.	.	.

NOTE: The X'X matrix has been found to be singular, and a generalized inverse was used to solve the normal equations. Terms whose estimates are followed by the letter 'B' are not uniquely estimable.

SAS Output for Question 3 (page 1 of 1)

The REG Procedure
Model: Model 1
Dependent Variable: strength

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	70.14488	7.79388	6.48	0.0036
Error	10	12.02512	1.20251		
Corrected Total	19	82.17000			

Root MSE	1.09659	R-Square	0.8537
Dependent Mean	8.15000	Adj R-Sq	0.7219
Coeff Var	13.45511		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	-104.56209	32.90995	-3.18	0.0099
x1	1	0.49230	0.18511	2.66	0.0239
x2	1	1.74003	0.61010	2.85	0.0172
x3	1	14.23558	7.01341	2.03	0.0698
x1sq	1	-0.00083770	0.00032438	-2.58	0.0273
x2sq	1	-0.01308	0.00418	-3.13	0.0107
x3sq	1	-3.17258	0.81096	-3.91	0.0029
x1x2	1	-0.00130	0.00144	-0.90	0.3879
x1x3	1	-0.02778	0.02154	-1.29	0.2262
x2x3	1	0.02778	0.07180	0.39	0.7069

The REG Procedure
Model: Model 2
Dependent Variable: strength

Analysis of Variance

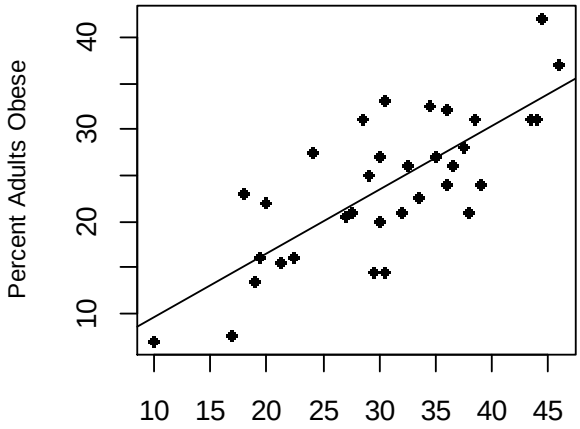
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	6	66.98488	11.16415	9.56	0.0004
Error	13	15.18512	1.16809		
Corrected Total	19	82.17000			

Root MSE	1.08078	R-Square	0.8152
Dependent Mean	8.15000	Adj R-Sq	0.7299
Coeff Var	13.26111		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	-80.27042	24.58258	-3.27	0.0061
x1	1	0.39045	0.16334	2.39	0.0327
x2	1	1.44003	0.47462	3.03	0.0096
x3	1	8.68002	1.82465	4.76	0.0004
x1sq	1	-0.00083770	0.00031971	-2.62	0.0212
x2sq	1	-0.01308	0.00412	-3.17	0.0073
x3sq	1	-3.17258	0.79927	-3.97	0.0016

SAS Output for Question 4 (page 1 of 1)




```
data obesity;
input drinks obese @@;
datalines;
10 7    18 23    20 22
. . . more data . . .
;
proc reg data=obesity plots=diagnostics;
 model obese = drinks;
 run;
```

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	1213.81256	1213.81256	45.08	<.0001
Error	32	861.54774	26.92337		
Corrected Total	33	2075.36029			

Root MSE	5.18877	R-Square	0.5849
Dependent Mean	23.83824	Adj R-Sq	0.5719
Coeff Var	21.76660		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	2.59740	3.28622	0.79	0.4351
drinks	1	0.69394	0.10335	6.71	<.0001

SAS Output for Question 5 (page 1 of 1)

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	3	68.08673	22.69558	15.14	0.0005
Error	10	14.98661	1.49866		
Corrected Total	13	83.07334			

Root MSE	1.22420	R-Square	0.8196
Dependent Mean	9.35571	Adj R-Sq	0.7655
Coeff Var	13.08503		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|	Variance Inflation
Intercept	1	2.11257	1.50660	1.40	0.1911	0
X1	1	0.43661	1.65383	0.26	0.7971	67.52225
X2	1	0.74324	1.69116	0.44	0.6697	69.45464
X3	1	0.63035	0.41593	1.52	0.1606	1.2945