LINEAR REGRESSION WITH EXCEL
See Agresti and Franklin Chp 3 (especially Example 14) and lecture notes

Question: Can education rates be used to predict crime rates in Florida?

Data taken from copyrighted text CD: FL crime
Analysis using Excel: Tools -> Data Analysis -> Regression with the following options
Labels: ON Residual plots: ON Line fit plots: ON

SUMMARY OUTPUT

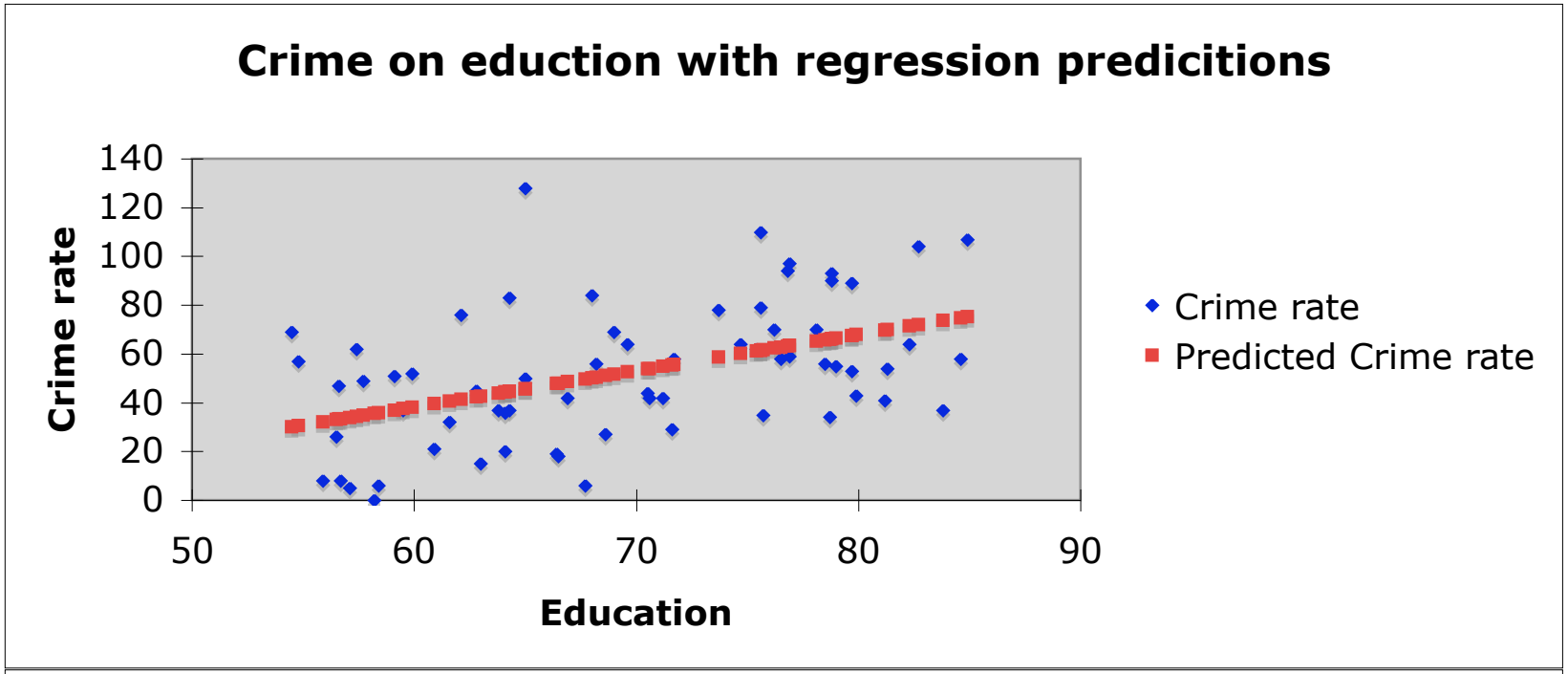
Regression Statistics			
Multiple R	0.46691188	**<---**	**Strength of linear association: see Section 3.2**
R Square	0.2180067	**<---**	**Strength of regression prediction (compared to mean prediction, cf AF 118-9)**
Adjusted R Sq	0.20597604		
Standard Erro	25.1227833		
Observations	67		

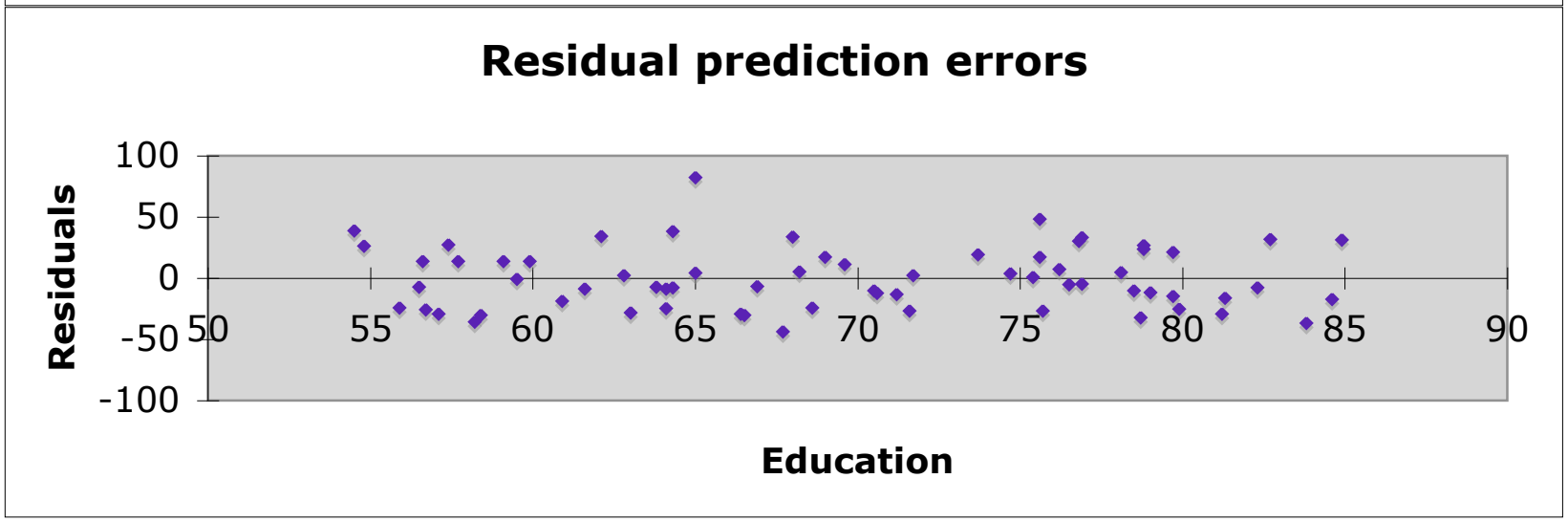
ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	11437.0937	11437.0937	18.1209172	6.8056E-05
Residual	65	41025.0257	631.154241		
Total	66	52462.1194			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-50.8569018	24.4506518	-2.07998144	0.04147477	-99.6882248	-2.02557885	-99.6882248	-2.02557885
Education	1.48597715	0.34907765	4.25686706	6.8056E-05	0.78882095	2.18313335	0.78882095	2.18313335

Predicted crime rate = -50.9 + 1.5*(Eduction rate)


Crime on eduction with regression predicitions
Crime rate
140
120
100
80
60
40
20
0
50
60
70
80
90
Education
Crime rate
Predicted Crime rate


Residual prediction errors
Residuals
100
50
0
-50
-100
50
55
60
65
70
75
80
85
90
Education

MULTIPLE REGRESSION WITH EXCEL
See Agresti and Franklin Chp 3 (especially Example 14) and lecture notes

Question: Can rates of education and urbanization be used to predict crime rates in Florida?

Data taken from copyrighted text CD: FL crime
Analysis using Excel: Tools -> Data Analysis -> Regression with the following options
Labels: ON Residual plots: OFF Line fit plots: OFF

SUMMARY OUTPUT

Regression Statistics			
Multiple R	0.68659983	**<---**	**Strength of linear association: see Section 3.2**
R Square	0.47141933	**<---**	**Strength of regression prediction (compared to mean prediction, cf AF 118-9)**
Adjusted R Sq	0.45490119		
Standard Erro	20.8155824		
Observations	67		

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	24731.6573	12365.8286	28.5394822	1.379E-09
Residual	64	27730.4621	433.288471		
Total	66	52462.1194			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	59.1180677	28.3653106	2.08416783	0.04114165	2.45184624	115.784289	2.45184624	115.784289
Education	-0.58337735	0.47245913	-1.23476787	0.22143115	-1.52722295	0.36046825	-1.52722295	0.36046825
Urbanization	0.68250142	0.12321259	5.53921822	6.1108E-07	0.43635598	0.92864686	0.43635598	0.92864686

Predicted crime rate = 59.1 - 0.6*(Eduction rate) + 0.7*(Urban rate)