

Adam Johnson

$$1) \hat{y} = 64,100 + 0.394X_1 + 9.6X_2 - 11,600X_3$$

a. X_1 = regional population

X_2 = per capita income

X_3 = regional unemployment rate

Multiple regression equation

b. 64,100 is the constant or estimate
y value if $X_1 = 0$, $X_2 = 0$ and $X_3 = 0$

$$c. \hat{y} = 64,100 + 0.394(796,000) + 9.6(6,940) - 11,600(6.0)$$

$$= \underline{\$1,374,748}$$

3) $\hat{y}$

$$3) \hat{y} = 16.24 + 0.17X_1 + 0.0028X_2 + 42X_3 + 0.0012X_4 + 0.19X_5 + 26.8X_6$$

X_1 age of first marriage

X_2 Annual income

X_3 number of Children Living

X_4 Value of all assets

X_5 Status of health

X_6 Social Activities

$$a. \hat{y} = 0.17(18) + 0.0028(26,500) + 42(3) + 0.0012(156,000) + 0.19(14) + 26.8(2.5) = \underline{497,736}$$

$$b. \quad 0.0028(10,000) = 28$$

$$28.8(2) = 53.6$$

two or more Social Activities would add more Satisfaction

5) Analysis of Variance

Source	Df	SS	MS	F	P
Regression	2 ^{reg}	SSR 77.907	MSR 38.954	4.14	0.021
Residual error	62	SSE 583.693	MSE 9.414		
Total	64	661.600			

$$a. \sqrt{\frac{SSE}{n-(k+1)}} = \sqrt{\frac{583.693}{65-(2+1)}} = 3.068$$

$$2(3.068) = 6.136$$

95% of residuals will be between ± 6.136

$$b. R^2 = \frac{SSR}{SSTotal} = \frac{77.907}{661.6} = .118$$

The coefficient explains 11.8% of the Variation

$n-1 = 64$
Total Sample Size 65

$$c. R^2_{adj} = 1 - \frac{\frac{SSE}{n-(k+1)}}{\frac{SSTotal}{n-1}} = 1 - \frac{\frac{583.693}{65-(2+1)}}{\frac{661.6}{65-1}} = 0.089$$

$$Ans = 0.089$$

b) Analysis of Variance

Source	Df	SS	MS	F
Regression	5 ^K	3710.00 ^{SA}	742.00 ^{MSR}	12.89
Residual Error	46	2647.38 ^{SSE}	57.55 ^{MSE}	
Total	51	6357.38 ^{SST}		

a. $\sqrt{57.55} = 7.586$
 $\pm 52(7.586) =$

95% of the residuals will be between ± 7.586

b. $R^2 = \frac{3710.}{6357.38} = 0.5836$

The coefficient explains 58.36% of the variation

c.

$$R^2_{\text{adj}} = 1 - \frac{2647.38}{\frac{52 - (5 + 1)}{6357.38}} = 0.5383$$