Quiz 3 (Individual) for Statistics 113
Statistics and Society - Spring 1999
Material Covered: Chapters 10,11 of notes
For: 26th February

This is a 15 minute quiz, worth 6% and marked out of 6 points. The total possible points awarded for each question is given in square brackets at the beginning of each question. Anything that can fit on one side of an $8\frac{1}{2}$ by 11 inch piece of paper may be used as a reference during this quiz. A calculator and appropriate statistical tables may also be used. No other aids are permitted.

Name (please print): ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯ .

last   first

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1. For small businessmen in Indiana in 1993, the relationship between education (years of schooling completed) and earned income can be summarized as follows:

$$\text{average education} \approx 12 \text{ years}, \quad \text{SD} \approx 3.5 \text{ years}$$
$$\text{average income} \approx \$31,000 \quad\quad \text{SD} \approx \$27,000 \quad r \approx 0.55$$

The scatter plot is football–shaped.

(a) [1] Eight years of education, in standard units, is (circle one) $-\mathbf{1.45}$ / $-\mathbf{1.14}$ / $-\mathbf{0.56}$ / $-\mathbf{0.25}$ / $-\mathbf{0.05}$ /

(b) [2] Predict, using the regression line,

the income of a businessman who has eight years of education: ⎯⎯⎯⎯⎯⎯⎯⎯ .

(c) [1] The r.m.s.

is equal to: ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯ .

(d) [2] The percentage of businessmen with 8 years of education

who had an income greater than \$35,000 is ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯ .

(a) [1] Eight years of education, in standard units, is $\frac{8-12}{3.5} \approx -1.14$

(b) [2] Predict, using the regression line, the income of a businessman who has eight years of education:

$(0.55)(-1.14) \approx -0.63; \quad (-0.63)(27,000) \approx -\$16,971.43; \quad \$31,000 - \$16,971.43 = \$14,028.57$

(c) [1] The r.m.s. is equal to: $\sqrt{1-r^2} \times$ SD of $y = \sqrt{1 - 0.55^2}(\$27,000) \approx$ **$\$22,549.45$**.

(d) [2] The percentage of businessmen with 8 years of education who had an income greater than \$35,000 is

$$\frac{35,000 - \$14,028.57}{\$22,549.45} \approx 0.93$$

then from the normal tables, $\frac{1}{2}(100 - 65) = 17.5\%$.