Introduction to Econometrics (Econ 107)
Drake University, Spring 2008
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Signature: _____

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MIDTERM EXAMINATION #2 ANSWER KEY
"Two-Variable Regression"
March 4, 2008

VERSION A

I. MULTIPLE CHOICE: [2 pts each—12 pts total]
(1)c. (2)e. (3)d. (4)b. (5)c. (6)d.

II. MULTIPLE ANSWER:

(1)	a. Yes.	b. Yes.	c. No.	d. Yes.	e. Yes.
(2)	a. Yes.	b. No.	c. No.	d. No.	e. No.
(3)	a. Yes.	b. No.	c. No.	d. No.	e. No.
(4)	a. Yes.	b. Yes.	c. No.	d. Yes.	e. Yes.
(5)	a. Yes.	b. No.	c. No.	d. No.	
(6)	a. No.	b. Yes.	c. Yes.	d. No.	e. No.
(7)	a. Yes.	b. Yes.	c. No.	d. No.	

III. PROBLEMS:
(1) [LS confidence intervals, tests, elasticity: 24 pts]
a. 76.56. b. 4.8. c. 0.27. d. $52.56 \pm 6.272 = (46.288, 48.832)$.
e. test statistic = 3.0, critical point = 1.645, reject null hypothesis.
(2) [LS confidence intervals, prediction: 24 pts]
a. 12. b. $-205 \pm 65.37 = (-270.37, -139.63)$. c. transformed $x_i = x_i - 0.02$.
d. 125. e. 5. f. $125 \pm 10.895 = (114.105, 135.895)$.

IV. CRITICAL THINKING:
The correlation of video game sales and house fires is *not* evidence that video games cause house fires. The correlation arises because of the difference in size across states. States with larger populations have both more house fires and more video games. A better way to estimate the regression equation would use all data in *per-capita* terms. In other words, all data should be divided by state population before estimating the regression:

$$\left(\frac{\text{House fires}}{\text{Population}}\right) = \beta_1 + \beta_2\left(\frac{\text{Video games sold}}{\text{Population}}\right) + \varepsilon .$$

VERSION B

I. MULTIPLE CHOICE: [2 pts each—12 pts total]
(1)a. (2)b. (3)c. (4)b. (5)a. (6)e.

II. MULTIPLE ANSWER:

(1)	a. Yes.	b. No.	c. Yes.	d. No.	e. No.

(2)	a. Yes.	b. No.	c. No.	d. No.	e. No.
(3)	a. Yes.	b. Yes.	c. No.	d. Yes.	e. Yes.
(4)	a. Yes.	b. Yes.	c. No.	d. No.	e. Yes.
(5)	a. No.	b. Yes.	c. Yes.	d. No.	
(6)	a. Yes.	b. No.	c. No.	d. No.	e. Yes.
(7)	a. No.	b. Yes.	c. No.	d. No.	

III. PROBLEMS:

(1) [LS confidence intervals, tests, elasticity: 24 pts]

a. 77.6. b. 6.4. c. 0.4. d. $45.6 \pm 4.9 = (40.7, 50.5)$.

e. test statistic = 6.4, critical point = 1.645, reject null hypothesis.

(2) [LS confidence intervals, prediction: 24 pts]

a. 14. b. $-250 \pm 85.8 = (-335.8, -164.2)$. c. transformed $x_i = x_i - 0.03$.

d. 85. e. 4. f. $85 \pm 8.58 = (76.42, 93.58)$.

IV. CRITICAL THINKING: (Same as Version A)

VERSION C

I. MULTIPLE CHOICE: [2 pts each—12 pts total]

(1)e. (2)c. (3)a. (4)c. (5)b. (6)a.

II. MULTIPLE ANSWER:

(1)	a. Yes.	b. No.	c. Yes.	d. No.	e. Yes.
(2)	a. Yes.	b. No.	c. No.	d. No.	e. No.
(3)	a. Yes.	b. Yes.	c. No.	d. Yes.	e. Yes.
(4)	a. Yes.	b. Yes.	c. No.	d. No.	e. Yes.
(5)	a. No.	b. Yes.	c. No.	d. No.	
(6)	a. Yes.	b. Yes.	c. No.	d. No.	e. No.
(7)	a. No.	b. Yes.	c. No.	d. No.	

III. PROBLEMS:

(1) [LS confidence intervals, tests, elasticity: 24 pts]

a. 78. b. 3.9. c. 0.25. d. $58.5 \pm 6.86 = (51.64, 65.36)$.

e. test statistic = 3.25, critical point = 1.645, reject null hypothesis.

(2) [LS confidence intervals, prediction: 24 pts]

a. 16. b. $-185 \pm 106 = (-291, -79)$. c. transformed $x_i = x_i - 0.04$.

d. 92. e. 3. f. $92 \pm 6.36 = (85.64, 98.36)$.

IV. CRITICAL THINKING: (Same as Version A)

[end of answer key]