

MIDTERM EXAMINATION #2 ANSWER KEY

VERSION A

I. MULTIPLE CHOICE

- (1)d. (2)b. (3)d. (4)b. (5)d.

II. SHORT ANSWER

- (1) a. true b. true c. false
(2) a. 6 b. 0.3
(3) a. 0 b. 1 c. 0
(4) a. not req'd b. required c. not req'd d. not req'd e. not req'd
(5) a. required b. required c. required d. not req'd e. not req'd
(6) a. required b. required c. required d. not req'd e. required
(7) a. false b. true c. false c. true
(8) a. false b. true c. true d. false
(9) a. 23 b. 0.02 c. 0.36 (same) d. 3.6 (same)

III. PROBLEMS

- (1) a. 127.5 b. \$10 c. 0.3 d. $87.5 \pm 39.2 = (48.3, 126.7)$
 e. Test statistic=2.5. Critical point=1.645. Yes, reject null hypothesis.
(2) a. DOF=9 b. $-0.52 \pm 0.6786 = (-1.1986, 0.1586)$. c. $\tilde{x}_i = x_i - 50$
 d. 60 e. 4 f. $60 \pm 9.048 = (50.952, 69.048)$.

IV. CRITICAL THINKING

The slope coefficient is highly significant, but the positive correlation is NOT evidence that libraries cause violent crime. The positive correlation across states between the number of violent crimes and the number of libraries is caused by the variation in the population size of states. States with large populations have more crime and more libraries than small states. A better way to estimate the regression relating crime to libraries would be to divide both variables by state population. The dependent variables would thus be violent crimes *per capita*, and the regressor would be libraries *per capita*. This regression would provide better evidence on the causal relation, if any, between violent crime and libraries.

VERSION B (RAW)

I. MULTIPLE CHOICE

- (1)e. (2)d. (3)b. (4)d. (5)b.

II. SHORT ANSWER

- (1) a. false b. true c. true
(2) a. 18 b. 0.6

- (3) a. 1 b. 0 c. 1
(4) a. not req'd b. not req'd c. not req'd d. required e. not req'd
(5) a. not req'd b. not req'd c. required d. required e. required
(6) a. not req'd b. required c. required d. required e. required
(7) a. true b. false c. false c. false
(8) a. true b. false c. false d. true
(9) a. 245 (same) b. 140.0 c. 0.48 (same) d. 2.8 (same)

III. PROBLEMS

- (1) a. 152 b. \$8 c. 0.2 d. $120 \pm 39.2 = (80.8, 159.2)$
e. Test statistic=1.333. Critical point=1.645. No, cannot reject null hypothesis.
(2) a. DOF=10 b. $-0.45 \pm 0.6684 = (-1.1184, 0.2184)$. c. $\tilde{x}_i = x_i - 60$
d. 55 e. 5 f. $55 \pm 11.14 = (43.86, 66.14)$.

IV. CRITICAL THINKING

Same as Version A.

VERSION C

I. MULTIPLE CHOICE

- (1)a. (2)e. (3)c. (4)a. (5)c.

II. SHORT ANSWER

- (1) a. true b. false c. false
(2) a. 6 b. 0.2
(3) a. 0 b. 1 c. 0
(4) a. not req'd b. not req'd c. not req'd d. required e. not req'd
(5) a. not req'd b. not req'd c. required d. required e. required
(6) a. not req'd b. required c. required d. required e. required
(7) a. false b. true c. true c. false
(8) a. false b. false c. true d. true
(9) a. 261 (same) b. 120 c. 0.52 (same) d. 2.4 (same)

III. PROBLEMS

- (1) a. 139 b. \$14 c. 0.35 d. $104 \pm 39.2 = (64.8, 143.2)$
e. Test statistic=3.5. Critical point=1.645. Yes, reject null hypothesis.
(2) a. DOF=11 b. $-0.50 \pm 0.4402 = (-0.9402, -0.0598)$. c. $\tilde{x}_i = x_i - 70$
d. 45 e. 3 f. $45 \pm 6.603 = (38.397, 51.603)$.

IV. CRITICAL THINKING

Same as Version A.

[end of answer key]