King Fahd University of Petroleum & Minerals
Department of Mathematics & Statistics
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Quiz #7

Name: *ID:* *Serial:*

A real estate builder wishes to determine how house size (House) is influenced by family income (Income), family size (Size), and education of the head of household (School). House size is measured in hundreds of square feet, income is measured in thousands of dollars, and education is in years. The builder randomly selected 50 families and ran the multiple regression and presented in the following output:

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Analysis of Variance

Source           DF      SS      MS      F          P
Regression        3   4081.2  1360.4    26.58612  0.000
Residual Error   46   2353.8  51.16957
Total            49   6435.0

S =7.153291    R-Sq = 63.42%  R-Sq(adj) = 61.03%

Predictor      Coef  SE Coef      T      P
Constant    -1.6335    5.808  -0.281  0.7798
income       0.4485    0.114   _____  0.0003
size         4.2615    0.806   _____  0.0001
school      -0.5616    0.432  -1.509  0.1383
```

Based on the above output, answer the following questions.

a. Fill the missing values in the above output.
b. What fraction of the variability in house size is explained by income, size of family, and education?
c. What is the predicted house size (in hundreds of square feet) for an individual earning an annual income of $40,000, having a family size of 4, and going to school a total of 13 years?
d. One individual in the sample had an annual income of $100,000, a family size of 10, and an education of 16 years. This individual owned a home with an area of 7,000 square feet. What is the residual (in hundreds of square feet) for this data point?
e. At the 0.01 level of significance, what conclusion should the builder draw regarding the inclusion of Income in the regression model?
f. At the 0.01 level of significance, what conclusion should the builder draw regarding the inclusion of School in the regression model?