KFUPM

Department of MATH & STAT

STAT319
Term-171

ID:_____

NAME:_____

The superintendent of a school district wanted to predict the percentage of students passing a sixth- grade proficiency test. She obtained the data on percentage of students passing the proficiency test (% Passing), mean teacher salary in thousands of dollars (Salaries), and instructional spending per pupil in thousands of dollars (Spending) of 47 schools in the state.

Following is the multiple regression output with Y = % Passing as the dependent variable, X_1 = Salaries and X_2 = Spending:

Regression Statistics	
Multiple R	0.4276
R Square	0.1828
Adjusted R Square	0.1457
Standard Error	5.7351
Observations	47

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	323.8284	161.9142	4.9227	0.0118
Residual	44	1447.2094	32.8911		
Total	46	1771.0378			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	-72.9916	45.9106	-1.5899	0.1190	-165.5184	19.5352
Salary	2.7939	0.8974	3.1133	0.0032	0.9853	4.6025
Spending	0.3742	0.9782	0.3825	0.7039	-1.5972	2.3455

1. which of the following is a correct statement?

A. The mean percentage of students passing the proficiency test is estimated to go up by 2.79% when mean teacher salary increases by one thousand dollars.

B. The mean teacher salary is estimated to go up by 2.79% when mean percentage of students passing the proficiency test increases by 1%.

C. The mean percentage of students passing the proficiency test is estimated to go up by 2.79% when mean teacher salary increases by one thousand dollars holding constant the instructional spending per pupil.

D. The mean teacher salary is estimated to go up by 2.79% when mean percentage of students passing the proficiency test increases by 1% holding constant the instructional spending per pupil.

2. which of the following is a correct statement?

A. 18.26% of the total variation in the percentage of students passing the proficiency test can be explained by mean teacher salary and instructional spending per pupil.

B. 18.26% of the total variation in the percentage of students passing the proficiency test can be explained by mean teacher salary and instructional spending per pupil after adjusting for the number of predictors and sample size.

C. 18.26% of the total variation in the percentage of students passing the proficiency test can be explained by mean teacher salary holding constant the effect of instructional spending per pupil.

D. 18.26% of the total variation in the percentage of students passing the proficiency test can be explained by instructional spending per pupil holding constant the effect of mean teacher salary.

3. which of the following is a correct statement?

A. 14.57% of the total variation in the percentage of students passing the proficiency test can be explained by mean teacher salary and instructional spending per pupil.

B. 14.57% of the total variation in the percentage of students passing the proficiency test can be explained by mean teacher salary and instructional spending per pupil after adjusting for the number of predictors and sample size.

C. 14.57% of the total variation in the percentage of students passing the proficiency test can be explained by mean teacher salary holding constant the effect of instructional spending per pupil.

D. 14.57% of the total variation in the percentage of students passing the proficiency test can be explained by instructional spending per pupil holding constant the effect of mean teacher salary.

4. predict the percentage of students passing the proficiency test for a school which has a mean teacher salary of 40,000 dollars, and an instructional spending per pupil of 2,000 dollars.

5. **estimate the mean percentage of students passing the proficiency test for all the schools that have a mean teacher salary of 40,000 dollars, and an instructional spending per pupil of 2,000 dollars.**

6. **which of the following is the correct null hypothesis to test whether instructional spending per pupil has any effect on percentage of students passing the proficiency test, taking into account the effect of mean teacher salary?**

A. $H_0:\beta_0=0$

B. $H_0:\beta_1=0$

C. $H_0:\beta_2=0$

D. $H_0:\beta_3=0$

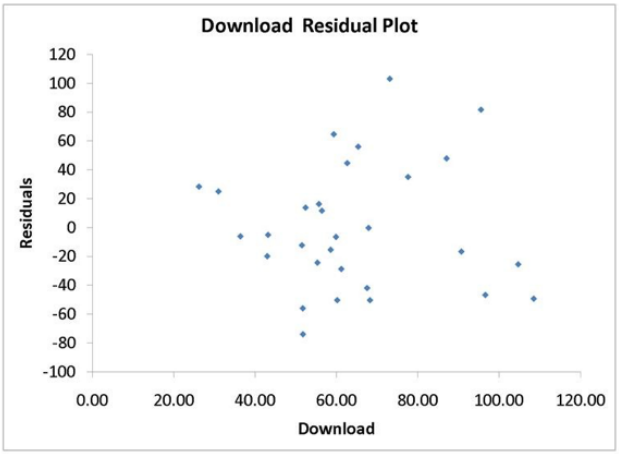
A computer software developer would like to use the number of downloads (in thousands) for the trial version of his new shareware to predict the amount of revenue (in thousands of dollars) he can make on the full version of the new shareware. Following is the output from a simple linear regression along with the residual plot and normal probability plot obtained from a data set of 30 different sharewares that he has developed:

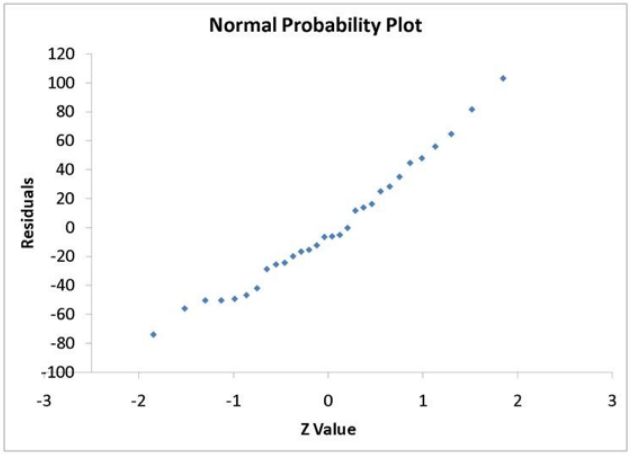
Regression Statistics	
Multiple R	0.8691
R Square	0.7554
Adjusted R Square	0.7467
Standard Error	44.4765
Observations	30.0000

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	171062.9193	171062.9193	86.4759	0.0000
Residual	28	55388.4309	1978.1582		
Total	29	226451.3503			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	-95.0614	26.9183	-3.5315	0.0015	-150.2009	-39.9218
Download	[redacted]	0.4011	9.2992	[redacted]	2.9082	4.5513





1. which of the following is the correct interpretation for the slope coefficient?

A. For each decrease of 1 thousand downloads, the expected revenue is estimated to increase by $ 3.7297 thousands.

B. For each increase of 1 thousand downloads, the expected revenue is estimated to increase by $ 3.7297 thousands.

C. For each decrease of 1 thousand dollars in expected revenue, the expected number of downloads is estimated to increase by 3.7297 thousands.

D. For each increase of 1 thousand dollars in expected revenue, the expected number of downloads is estimated to increase by 3.7297 thousands.

2. which of the following assumptions appears to have been violated?

A. Normality of error.

B. constant variance.

C. Independence of errors.

D. None of the above.

3. what is the standard error of estimate?

A. $1978.1582 thousands

B. $86.4759 thousands

C. $55388.4309 thousands

D. $44.4765 thousands

- **For a multiple regression model the following statistics are given:**

Total variation in Y = SSY = 250, SSE = 50, k = 4, n = 20

The coefficient of determination adjusted for n and k is: