1. The following is a partial output when Y is regressed on X for 30 observations

   (a) Complete the output

ANOVA Table				
Source	df	Sum of Squares	Mean Square	F
Regression	——-	1848.76	——-	———
Error	——-	————-	——-	———
Coefficients Table				
	Estimate	Std. Error	t valus	$P(>\|t\|)$
Intercept	-23.4325	12.74	——-	0.8316
X	——-	0.1528	8.32	6.978225e-08
n=	$r^2 =$	$r_a^2 =$	$s =$	df(MSE)=

   (b) Construct a 95% confidence interval for β_1 and interpret your result.

2. The following is a partial output when Y is regressed on X_1 and X_2

ANOVA Table				
Source	df	Sum of Squares	Mean Square	F
Regression	————-	3042.32	——-	———
Error	————-	1254.65	——-	
Coefficients Table				
	Estimate	Std. Error	t valus	$P(>\|t\|)$
Intercept	9.8709	7.0610	———	0.1735
X_1	0.6435	0.1185	———	< 0.0001
X_2	0.2112	0.1344	———	0.1278
n= 30	$r^2 =$	$r_a^2 =$	$s =$	df(MSE)=

   (a) Complete the output

   (b) Construct a 95% confidence interval for β_1 and interpret your result.

   (c) Test $H_0 : \beta_1 = \beta_2 = 0$. Use $\alpha = 0.05$.

3. The following table shows the regression output of a multiple regression model relating the beginning salaries in dollars of 30 employees is a given company to the following predictor variables:

- Gender (a dummy variable (1=male, 0=female)
- Education (Years of schooling at time of the hire)
- Experience (Number of months of previous work experienc)
- Months (number of months with the company)

ANOVA Table				
Source	df	Sum of Squares	Mean Square	F
Regression	——	23665352	——	——-
Error	——-	22657938	——-	
Coefficients Table				
	Estimate	Std. Error	t valus	$P(>\|t\|)$
Intercept	3526.4	327.7	10.76	0.000
Gender	722.5	117.8	6.13	0.000
Education	90.02	24.69	3.65	0.000
Experience	1.269	0.5877	2.16	0.034
Months	23.406	5.201	4.50	0.000

(a) Construct a 95% confidence interval for β_1 and interpret your result.

(b) Test $H_0 : \beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$ Use $\alpha = 0.05$.

(c) Compute r^2, r_a^2 and s

(d) Test $H_0 : \beta_1 = 700$ against $H_a : \beta_1 \neq 700$. Use $\alpha = 0.05$.

4. In a regression of y on x the least squares line is given by

$$\hat{y} = 4.162 + 15.509x$$

Answer the following questions if $n = 14, s = 5.392, \bar{x} = 6$ and $\sum_{i=1}^{14}(x-\bar{x})^2 = 114$.

(a) Construct a 95% confidence interval for the mean value of y when $x = 4$. Interpret your result

(b) Construct a 95% prediction interval for a value of y when $x = 4$. Interpret your result

5. Consider the regression model

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_2 + \epsilon$$

and suppose we wish to test $H_0 : \beta_1 = \beta_2 = 0$ against H_a : at least one of them is not zero. Assume $n = 20, SSE_R = 650$ and $SSE_C = 500$. Test H_0 against H_a using $\alpha = 0.05$.