EXAM-1
MA 542 RERESSION ANALYSIS
SPRING 2018

Show all works for partial credits. You may use one double sided handwritten sheet.
This is an in-class test, so time is a factor. Do not spend too much time on one problem.

1. A criminologist is studying the relationship between level of eduacation, X (percentage of individual in the country having at least a high-school diploma) and Y, the crime rate (crimes repoted for 100 residents) in medium-sized U.S. counties. The following is the R output resulted from fitting simple linear model with usual assumptions of normal error and independent observations.

Residuals:

Min	1Q	Median	3Q	Max
-5.2783	-1.7575	-0.2105	1.5753	6.8033

Coefficients:

	Estimate	Std. Error	t value	$Pr(>\|t\|)$
(Intercept)	20.51760	3.27764	6.260	1.67e-08 ***
X	-0.17058	0.04157	-4.103	9.57e-05 ***

Signif. codes: 0 *** 0.001 ** 0.01 * 0.05 . 0.1 1

Residual standard error: 2.356 on 82 degrees of freedom
Multiple R-squared: 0.1703, Adjusted R-squared: 0.1602
F-statistic: 16.83 on 1 and 82 DF, p-value: 9.571e-05

Analysis of Variance Table:

Response: Y

	Df	Sum Sq	Mean Sq	F value	$Pr(>F)$
X	1	93.46	93.463	16.834	9.571e-05 ***
Residuals	82	455.27	5.552		

Descriptive Statistics:

Variable	n	Mean	Variation
Crime rate (Y)	84	7.1112	$\sum(Y_i - \bar{Y})^2 = 548.7361$
Ed.level (X)	84	78.5957	$\sum(X_i - \bar{X})^2 = 3212.2381$