MTH 325, Quiz #2, Spring 2024 Name KEY

Instructions: Answer each question as thoroughly as possible. Round answers to 4 decimal places as needed. Exact answers are best when possible. Be sure to answer all parts of each question.

1. The data below compares the percentage light absorption and peak photovoltage.

x	4.09	9.06	13.33	19.23	22.06	24.61	29.50	30.08	30.51
y	1.04	1.12	0.81	1.41	1.10	1.12	1.88	1.56	1.88

a. Enter the data into R and create a scatterplot. Does the data appear linear? How strong is the correlation? Somewhat, yes ~ 0.7557511

b. Construct a simple linear regression equation. $y = 0.029816x + 0.719940$

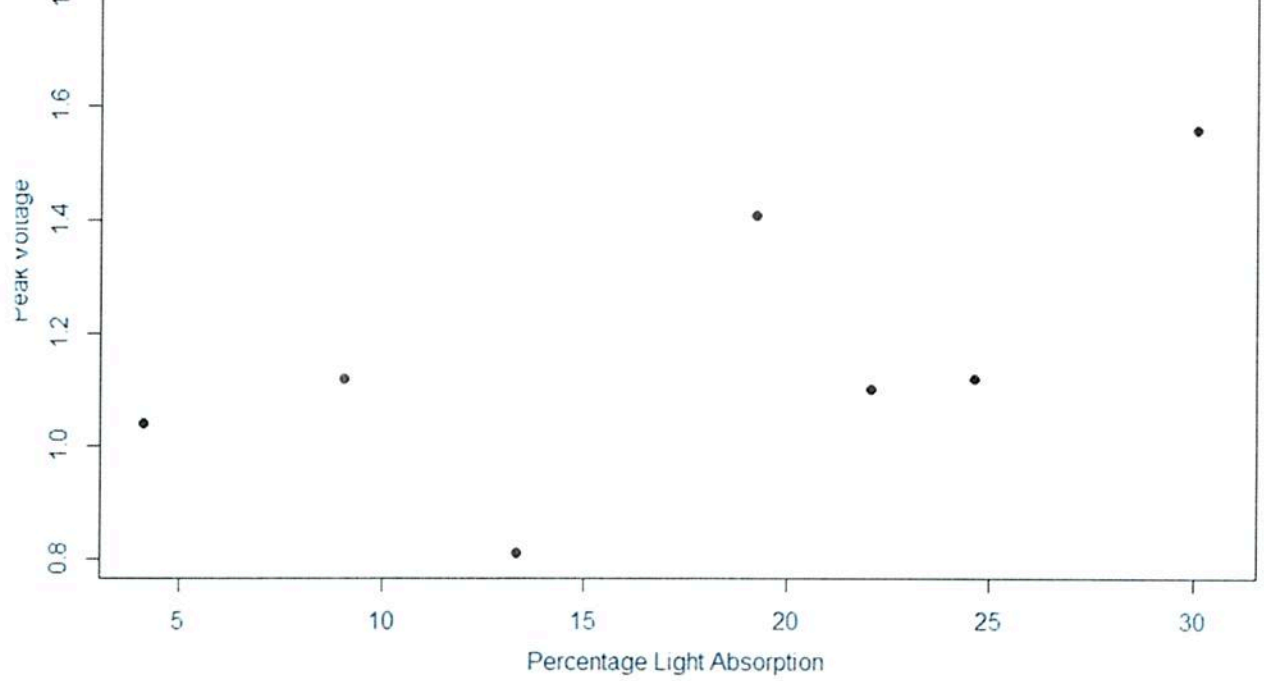
c. What proportion of the variability in peak photovoltage can be explained by the percentage of light absorption? 57.12%

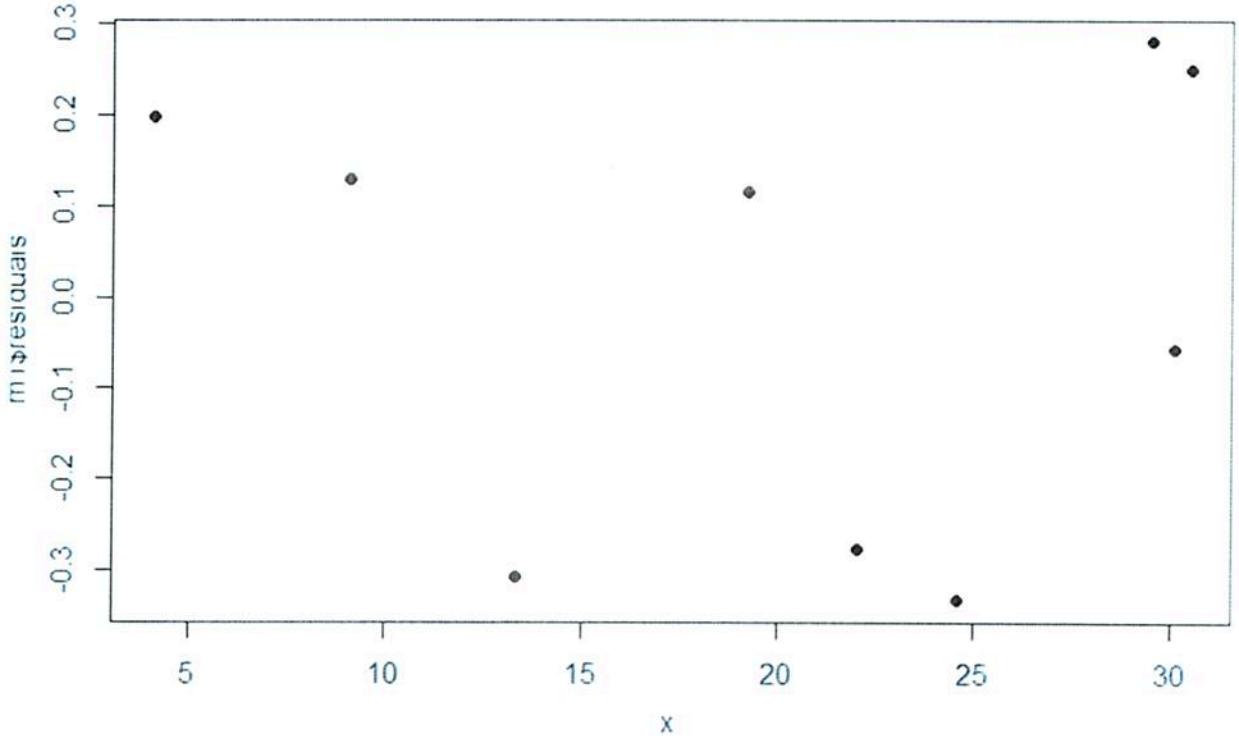
d. Predict peak (mean) photovoltage when % absorption is 18.1%. 1.25961

e. Describe your hypothesis test of the model/slope coefficient. $H_0: \beta_1 = 0$, $H_a: \beta_1 \neq 0$ p-value = 0.0185 reject null

f. Plot your residuals.

Include all graphs and model output to support your analysis.


Light Absorption vs. Peak Voltage
Peak Voltage
0.8
1.0
1.2
1.4
1.6
1.8
5
10
15
20
25
30
Percentage Light Absorption


m1$residuals
-0.3
-0.2
-0.1
0.0
0.1
0.2
0.3
5
10
15
20
25
30
x