First Name: Binh Last Name: Nguyen Student No: 20687353

<u>Problem 5:</u> Fill in the information below based on your data which were generated using your ID number as the seed for the random number generator.

alpha = 8.598549 beta = 1.320107 model = 4

sample correlation = 0.6343966

Insert the output of the command `Summary(RegModel)`

Call:

lm(formula = y ~ x)

Residuals:

Min	1Q	Median	3Q	Max
-29.0532	-3.7977	0.3168	3.0681	28.0490

Coefficients:

	Estimate	Std. Error	t value	Pr(>|t|)	
(Intercept)	8.0222	1.7262	4.647	1.05e-05	***
x	1.2111	0.1491	8.124	1.38e-12	***

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

Residual standard error: 7.616 on 98 degrees of freedom

Multiple R-squared: 0.4025, Adjusted R-squared: 0.3964

F-statistic: 66.01 on 1 and 98 DF, p-value: 1.376e-12

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Obtain the following information from this output:

estimate of the intercept = 8.0222

estimate of the slope = 1.2111

degrees of freedom of t distribution = 98

value of test statistic for testing H: no relationship (slope = 0) equals 8.124

p-value for testing the H: no relationship (slope = 0) equals $1.38*10^{-12}$

Insert your conclusion regarding the hypothesis of no relationship here.

Since p-value < 5%, there is a very strong evidence against the hypothesis of no relationship here (slope = 0) based on data

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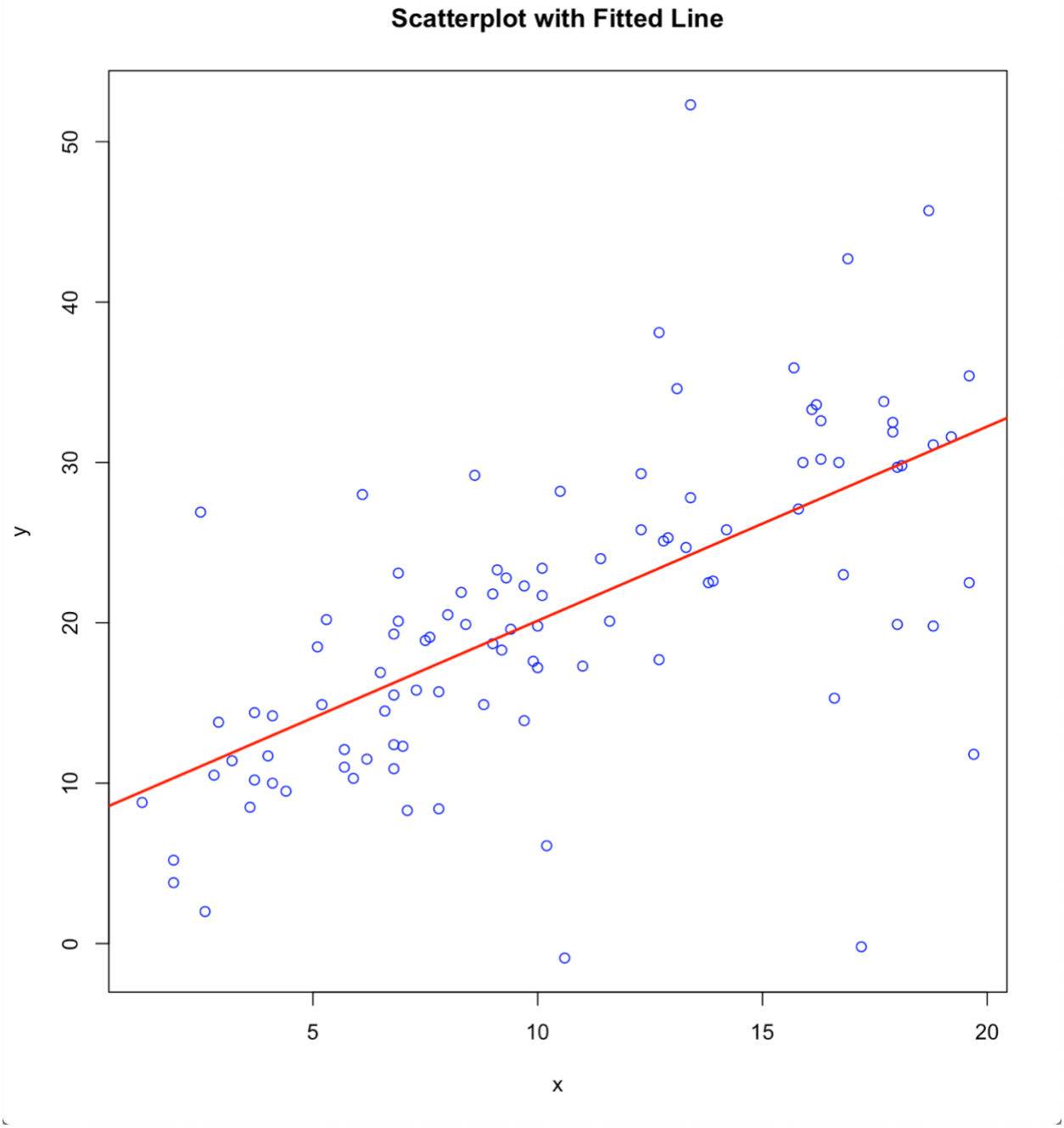
Insert the scatterplot with fitted line and plot of Residual versus x on this page.



The scatterplot shows that y is proportional to x, and there is a quite strong positive relationship between x and y, or r>0

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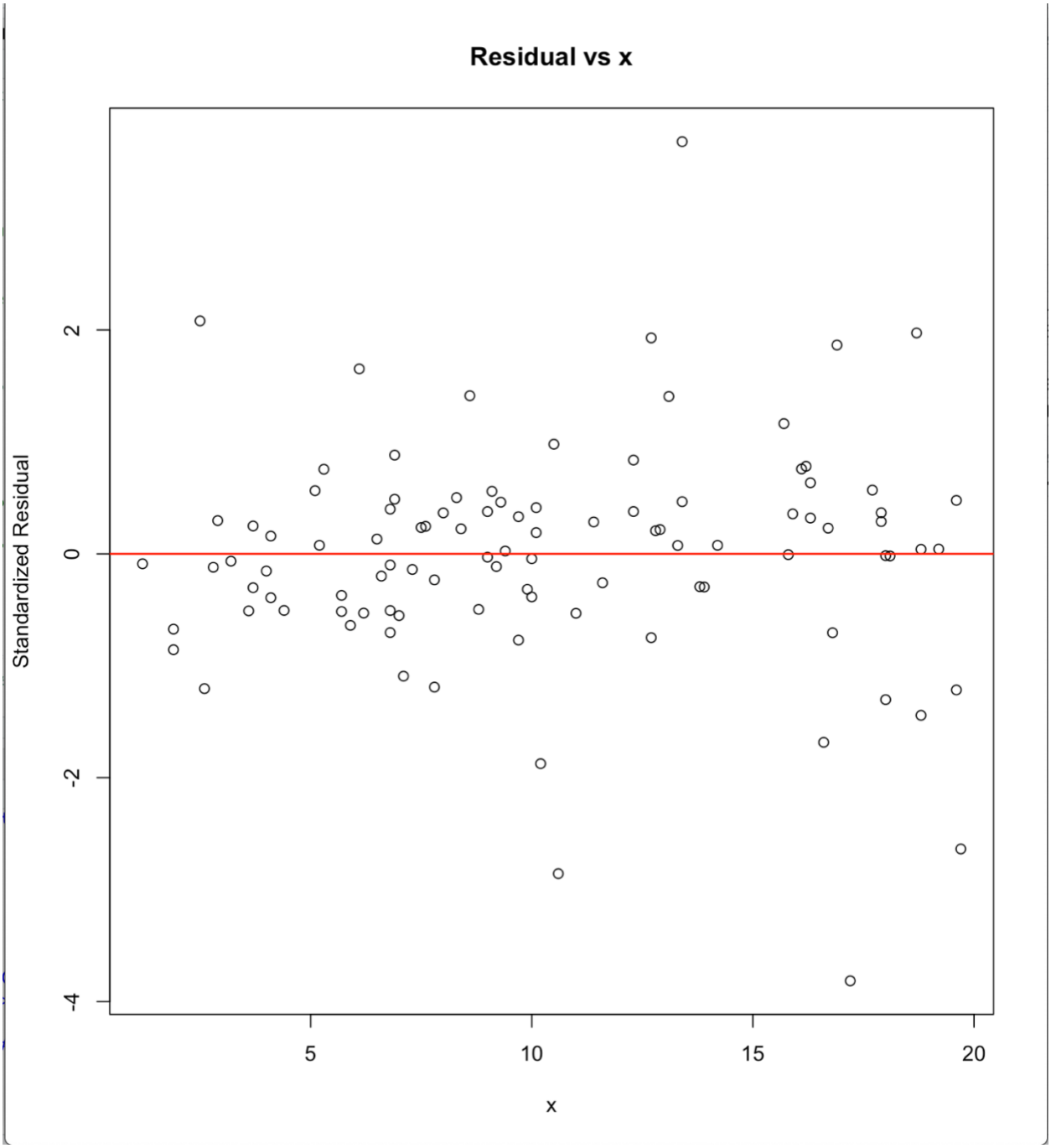

The pattern of points suggest that the points lie reasonably within a horizontal constand band around the line r_hat_i = 0 which suggests that the model assumptions are reasonable

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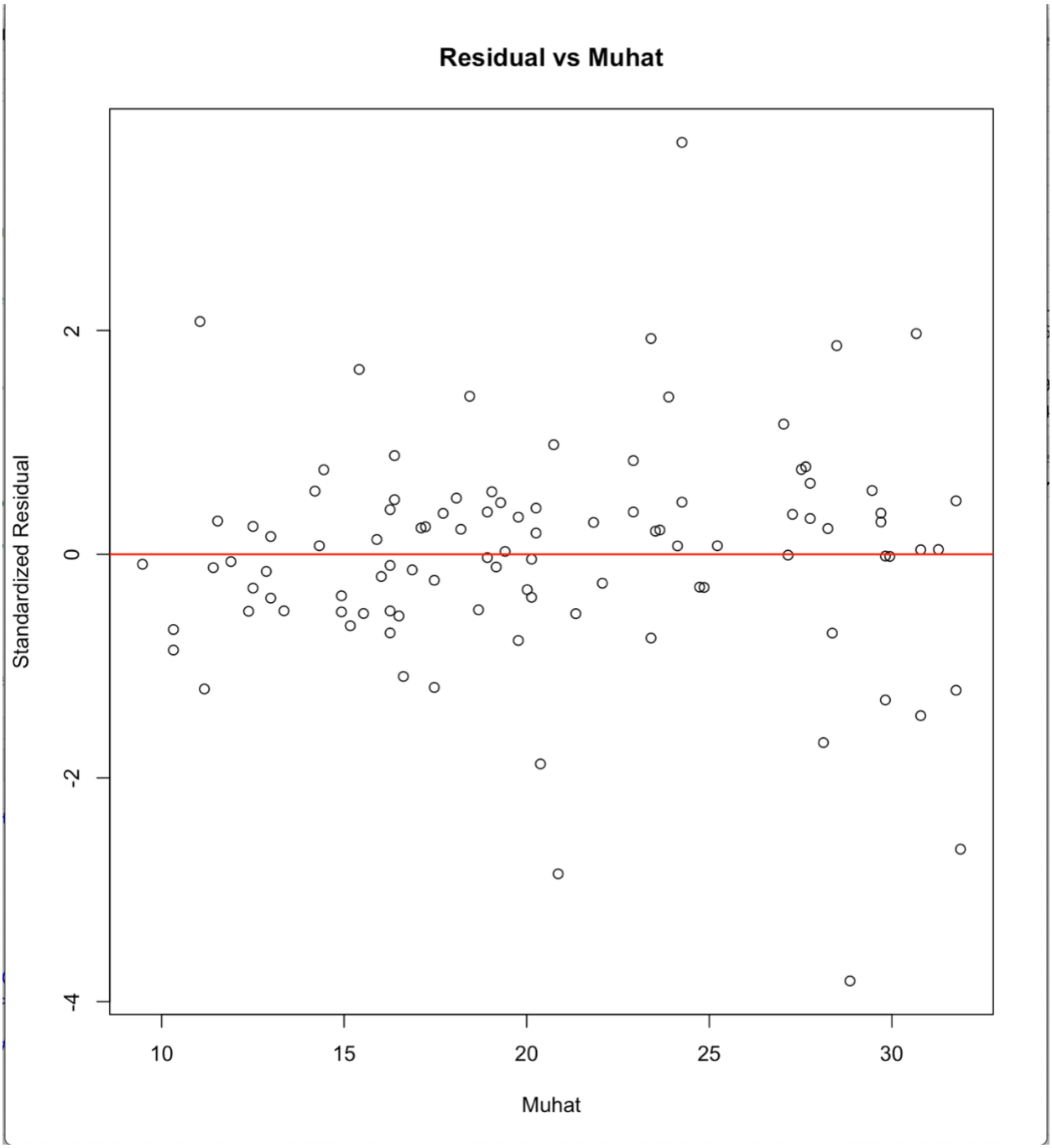
Insert the plot of Residuals versus Muhat and qqplot of Residuals on this page.



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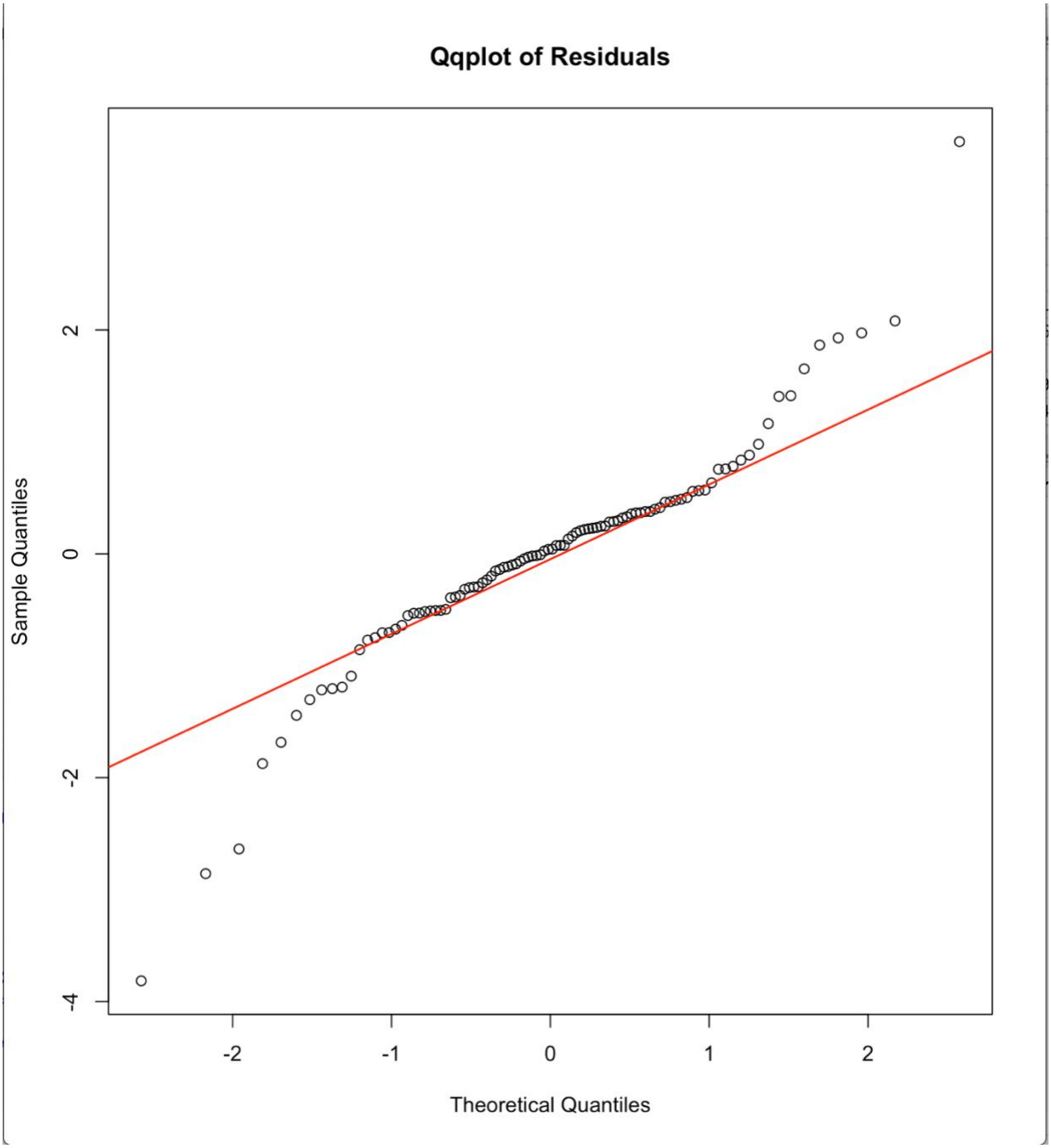

Since the points in the qqplot of standardized residuals lie reasonably a long a straight line the Gaussian assumption seems reasonable. Since quantiles of the Normal distribution change more rapidly in the tails of the distribution, we expect the points at both ends of the line to lie further from the line

Based on the scatterplot with fitted line and the residual plots discuss the fit of the simple linear model to your data. Be sure to comment on each plot. Indicate clearly what you expect to see for each plot if the model assumptions hold and what you observe for your data.

Estimate of the slope: 1.21

95% confidence interval for the slope:

[4.5965240, 11.447871]

Estimate of mean response at x=5: 14.07772

90% confidence interval for the mean response at x=5:

[12.23896, 15.91648]

Estimate of predicted response at x=2: 10.44441

99% prediction interval for the response at x=2:

[-9.929617, 30.81843]

Estimate of sigma: 7.616284

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95% confidence interval for the sigma:

[6.683017, 8.854914]