After you have completed the assignment, please save, scan, or take photos of your work and upload your files to the questions below. Crowdmark accepts PDF, JPG, and PNG file formats.

Q1 (10 points)

Q1(10 points). Consider the linear regression model $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \epsilon$.

1(5). The residuals are listed below: 0.2, 0.3, -0.8, -0.8, -0.3, 0.4, 0.1,-0.1, -0.4, -0.7, 0.6, -0.1, -0.1, 0.3,0.2. Do a Durbin-Watson test H_0 : the error terms are not (first-order) autocorrelated. H_a: the error terms are negatively or positively (first-order) autocorrelated. Let $\alpha = 0.1$.

2(5). The residuals are: 0.2, 0.3, -0.8, -0.8, -0.3, calculate $e_{(i)}, z_{(i)}$ and construct the normal plot.

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Q2 (20 points)

Q2(20 points). The sample data set is show as following

x: 1, 0, 3, 2

y: 4, 3, 1, 3

Apply the matrix form to calculate

1(9 points) The least squares estimates of β_0, β_1.

2(4 points) SS_{Res}, SS_R, SS_T, multiple coefficient of determination R^2 .

3(2 points) Predict y_0 given $x_0 = [1, 2]$.

4(5 points) 90% prediction interval for y_0 given $x_0 = [1, 2]$.

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