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Pstat126 Fall 2017 HW2

Q1a. Y=(1,2,3,4,5)

Q1b. Y=(11,12,13,14,15)

Q1c. Y=(8,11,14,17,20)

Q1d. Y=(11,13,20,20,80) P-value=.109

Q2a. Ho:B1=0 Ha:B1/=0

Q2b. Ho:B1=0 Ha: B1>0 or Ha: B1<0

Q3a. Ho: Age does not affect glucose level. Ha: Age impacts glucose level.

t= 7.647  
 SE=0.09061  
 P-Value=6.21e-14  
   
 We can reject the null hypothesis. The P-value is near zero, implying there is a significant relation between age and glucose levels.  
   
 The slope is weak and positive.  
   
 R-squared: 0.07136, showing that about 7% of variance in the regression model can be explained by age.

Q3b.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | SS | df | MS | F | p |
| Regression | 50703 | 1 | 50703 | 58.479 | 6.208e-14 |
| Error | 659805 | 761 | 867 | --- | --- |
| Total | 710508 | 762 | --- | 58.479 | 6.208e-14 |

P-value from the F-test is 6.208e-16, thus we reject the null hypothesis. There is a significant relation between glucose level and age.

Q3c. 90% Confidence interval Intercept {93.3663426 103.8985479}, Slope {0.5436953 0.8421429}

Q4a. Ho: Child height is independent of father height.

Ha: Child height is dependent on father height.

t=9.337  
 SE=.04783  
 P-Value= <2e-16  
   
 We reject the null hypothesis. The p-value is near zero, implying that there is a significant relation between father height and child height.  
   
 The slope is moderate and positive.  
   
 R-squared: 0.154, showing that about 15% of the variance in the regression model can be explained by father height.

Q4b.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | SS | df | MS | F | p |
| Regression | 508.81 | 1 | 508.81 | 87.17 | <2.2e-16 |
| Error | 2795.93 | 479 | 5.84 | --- | --- |
| Total | 3304.74 | 480 | --- | 87.17 | <2.2e-16 |

P-value from the F-test is near zero (<2.2e-16), thus we reject the null hypothesis. There is a significant relation between child height and father height.

Q4c. 90% confidence interval Intercept {32.9102458, 43.8149163}, Slope {0.3677043, 0.5253409}