Week1-Quiz

2020年12月6日　11:33

1. Enter the following dataset in R using concatenation operator. You may edit the code fragment below:

1 / 1 point

37, 86, 79, 95, 61, 93, 19, 98, 121, 26, 39, 11, 26, 75, 29,130, 42, 8###

Obtain 5-number summary. You may edit the code fragment below. What is the sample mean?

```
1  data=c(37, 86, 79, 95, 61, 93, 19, 98, 121, 26, 39, 11, 26, 75, 29,130, 42, 8) #
     Edit this line
2  summary(data) # Edit this line
```

Run

Reset

```
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
   8.00   26.75   51.50   59.72   91.25  130.00
```

- ○ 51.50
- ◉ 59.72

✓ **Correct**

Good work! That's the "arithmetic mean".

2. Find the summary of the dataset given in the following code block. What is the 3rd quartile? **1 / 1 point**

```
1  data=c(37, 86, 79, 95, 61, 93, 19, 98, 121, 26, 39, 11, 26, 75, 29,130, 42, 8) #
     Edit this line
2  summary(data) # Edit this line
```

Run

Reset

```
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
   8.00   26.75   51.50   59.72   91.25  130.00
```

- ○ 130
- ○ 26.75
- ◉ 91.25

✓ **Correct**

Correct! 3rd quartile is approximately middle of the higher 50% of the data.

4. We are still working on the dataset 'cheddar' from the package 'faraway'. Apply simple linear regression model for the bivariate data 'taste' (modeled as a random variable Y) vs 'H2S' (modeled as a random variable X) in the dataset 'cheddar' in using lm() routine in the following code block. What is the model? **1 / 1 point**

```
1  library(faraway)
2  m=lm(taste~H2S, data=cheddar)
3  summary(m)
4
```

Run

Reset

```
Call:
lm(formula = taste ~ H2S, data = cheddar)

Residuals:
    Min      1Q  Median      3Q     Max
-15.426  -7.611  -3.491   6.420  25.687

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  -9.7868     5.9579  -1.643    0.112
H2S           5.7761     0.9458   6.107 1.37e-06 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 10.83 on 28 degrees of freedom
Multiple R-squared:  0.5712,    Adjusted R-squared:  0.5558
F-statistic: 37.29 on 1 and 28 DF,  p-value: 1.374e-06
```

- $Y = --9.7868 + 5.7761 * X + \epsilon$

  where $\epsilon \sim N(0, 0.5712^2)$.

- $Y = -1.643 + 6.107 * X + \epsilon$

  where $\epsilon \sim N(0, 10.83^2)$.

- (selected) $Y = -9.7868 + 5.7761 * X + \epsilon$

  where $\epsilon \sim N(0, 10.83^2)$.

Correct

5. What is the sum of the residuals in the simple linear regression model of Question 4? **1 / 1 point**

```
1 library(faraway)
```

Run

Reset

- (selected) 0
- 736

Correct

Correct! Theoretically the sum of the residuals in a simple linear regression model is 0.

6. What is the sum of the fitted values in the simple linear regression model of Question 4? We can get the fitted values by using lm()$fitted routine. **1 / 1 point**

```
1 library(faraway)
2 m=lm(taste~H2S, data=cheddar)
3 sum(m$fitted)
```

Run

Reset

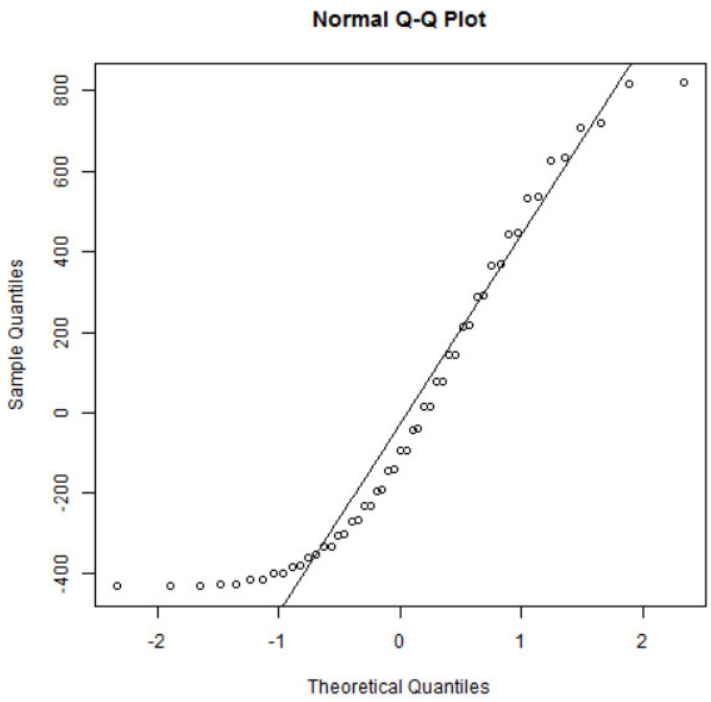
```
[1] 736
```

- 0
- 736 (selected)

Correct

Correct!

7. Does this data set appear to be normally distributed? 1 / 1 point



- ○ Yes.
- ◉ No.

✓ **Correct**

Correct! These errors appear to depart from a normal - look at how the tails move away from the straight line.

8. Suppose you are testing the null hypothesis that a population mean is 0 against the alternative that it is not zero at the alpha=0.05 level of significance. **1 / 1 point**

Given the following function call and printout, can you reject your null hypothesis?

```
1  data = c(7,  5,  1,  7,  2,  5,  2,  4, 10,  6);
2  t.test(data, alternative = "two.sided", paired=FALSE)
```

Run

Reset

```
        One Sample t-test

data:  data
t = 5.6003, df = 9, p-value = 0.0003342
alternative hypothesis: true mean is not equal to 0
95 percent confidence interval:
 2.920702 6.879298
sample estimates:
mean of x
      4.9
```

- (●) Yes.
- ( ) No.

✓ **Correct**

Good job! The p-value is much less that 0.05 so this data set is rather improbable under the null hypothesis.

9. Do you believe the R printout matches the regression in the figure? **1 / 1 point**

Call:

lm(formula = y ~ x)

Coefficients:

(Intercept) x

-4.48 -2.82