# Quiz 3, Business Statistics, Summer 2023

ⓘ This is a preview of the published version of the quiz

Started: Aug 14 at 5:20pm

# Quiz Instructions

You have 1 hour to complete the quiz.

You can start it any time you want in the availability window, but once you start,

you have to finish it in an hour.

The test is open book, open notes, open internet, you just can't interact with a person.

There is just one question with 9 parts.

Each part is worth one point.

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## Question 1 — 1 pts

A large company hired 75 new employees.

To assess the effectiveness of a training program, the company randomly picked 37

of the new employees to take special training.

The company collected the data on the following variables to for each of the 75 new employees.

d: 1 if the employee was given the training and 0 otherwise

x: score on a test taken at the time they were hired

y: score on a test taken after a period of employment (during which some took the training).

The data is plotted here: **training data.** (https://www.rob-mcculloch.org/bs_2023/webpage/training.pdf)

To analyze the data, the company ran the multiple regression to estimate the model

$$y_i = \beta_0 + \beta_1 x_i + \beta_2 d_i + \epsilon_i$$

Here is the regression output:

```
Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  16.8484    12.1030   1.392    0.168
x             0.6382     0.1189   5.370 9.20e-07 ***
d            19.5476     2.1867   8.939 2.71e-13 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 9.468 on 72 degrees of freedom
Multiple R-squared:  0.6008,    Adjusted R-squared:  0.5897
F-statistic: 54.19 on 2 and 72 DF,  p-value: 4.381e-15
```

True or false:

From the plot, the multiple regression is, at least approximately, a reasonable way to think about the data.

- ◯ True
- ◯ False

## Question 2

**1 pts**

The sample correlation between y and x is

- ◯ .9
- ◯ .1

- ◯ .4
- ◯ -.6

## Question 3 — 1 pts

The 95% confidence interval for $\beta_1$ included 0.

- ◯ True
- ◯ False

## Question 4 — 1 pts

The 95% confidence interval for $\beta_2$ includes 0.

- ◯ True
- ◯ False

## Question 5 — 1 pts

The plug in prediction for y given x=110 and d=1 is

- ◯ 81
- ◯ 87
- ◯ 107
- ◯ 91

## Question 6

1 pts

The plug in prediction for y given x=110 and d=0 is

- ◯ 81
- ◯ 87
- ◯ 95
- ◯ 107

## Question 7

1 pts

The total width of a plug in predictive 95% interval for y given x and d is

- ◯ 59
- ◯ 9.5
- ◯ 19
- ◯ 38

## Question 8

1 pts

The correlation between y and the fitted values is

- ◯ -.28
- ◯ .4
- ◯ .77
- ◯ .6

## Question 9

1 pts

The correlation between y and the residuals is

- ◯ -.28
- ◯ .98
- ◯ .63
- ◯ 0

Not saved Submit Quiz