Feedback — Quiz 1

You submitted this quiz on **Fri 6 Jun 2014 10:44 AM PDT**. You got a score of **10.00** out of **10.00**.

Question 1

Consider the data set given below

```
x <- c(0.18, -1.54, 0.42, 0.95)
```

And weights given by

```
w <- c(2, 1, 3, 1)
```

Give the value of μ that minimizes the least squares equation $\sum_{i=1}^{n} w_i (x_i - \mu)^2$

Your Answer		Score	Explanation
⦿ 0.1471	✔	1.00	
◯ 1.077			
◯ 0.300			
◯ 0.0025			
Total		1.00 / 1.00	

Question 2

Consider the following data set

```
x <- c(0.8, 0.47, 0.51, 0.73, 0.36, 0.58, 0.57, 0.85, 0.44, 0.42)
y <- c(1.39, 0.72, 1.55, 0.48, 1.19, -1.59, 1.23, -0.65, 1.49, 0.05)
```

Fit the regression through the origin and get the slope treating y as the outcome and x as the

regressor. (Hint, do not center the data since we want regression through the origin, not through the means of the data.)

Your Answer		Score	Explanation
⦿ 0.8263	✔	1.00	
○ -1.713			
○ 0.59915			
○ -0.04462			
Total		1.00 / 1.00	

Question 3

Do `data(mtcars)` from the datasets package and fit the regression model with mpg as the outcome and weight as the predictor. Give the slope coefficient.

Your Answer		Score	Explanation
○ 30.2851			
⦿ -5.344	✔	1.00	
○ 0.5591			
○ -9.559			
Total		1.00 / 1.00	

Question 4

Consider data with an outcome (Y) and a predictor (X). The standard deviation of the predictor is one half that of the outcome. The correlation between the two variables is .5. What value would the slope coefficient for the regression model with Y as the outcome and X as the predictor?

Your Answer	Score	Explanation

Your Answer		Score
○ 3		
○ 0.25		
⦿ 1	✔	1.00
○ 4		
Total		1.00 / 1.00

Question 5

Students were given two hard tests and scores were normalized to have empirical mean 0 and variance 1. The correlation between the scores on the two tests was 0.4. What would be the expected score on Quiz 2 for a student who had a normalized score of 1.5 on Quiz 1?

Your Answer		Score	Explanation
○ 1.0			
○ 0.4			
○ 0.16			
⦿ 0.6	✔	1.00	
Total		1.00 / 1.00	

Question 6

Consider the data given by the following

```
x <- c(8.58, 10.46, 9.01, 9.64, 8.86)
```

What is the value of the first measurement if x were normalized (to have mean 0 and variance 1)?

Your Answer		Score	Explanation
○ 9.31			
○ 8.58			

⦿ -0.9719	✔	1.00
◯ 8.86		
Total		1.00 / 1.00

Question 7

Consider the following data set (used above as well). What is the intercept for fitting the model with x as the predictor and y as the outcome?

```
x <- c(0.8, 0.47, 0.51, 0.73, 0.36, 0.58, 0.57, 0.85, 0.44, 0.42)
y <- c(1.39, 0.72, 1.55, 0.48, 1.19, -1.59, 1.23, -0.65, 1.49, 0.05)
```

Your Answer		Score	Explanation
⦿ 1.567	✔	1.00	
◯ 1.252			
◯ 2.105			
◯ -1.713			
Total		1.00 / 1.00	

Question 8

You know that both the predictor and response have mean 0. What can be said about the intercept when you fit a linear regression?

Your Answer		Score	Explanation
◯ Nothing about the intercept can be said from the information given.			
⦿ It must be identically 0.	✔	1.00	
◯ It is undefined as you have to divide by zero.			
◯ It must be exactly one.			

Total		1.00 / 1.00

Question 9

Consider the data given by

```
x <- c(0.8, 0.47, 0.51, 0.73, 0.36, 0.58, 0.57, 0.85, 0.44, 0.42)
```

What value minimizes the sum of the squared distances between these points and itself?

Your Answer		Score	Explanation
⦿ 0.573	✔	1.00	
◯ 0.8			
◯ 0.36			
◯ 0.44			
Total		1.00 / 1.00	

Question 10

Consider taking the slope having fit Y as the outcome and X as the predictor, β_1 and the slope from fitting X as the outcome and Y as the predictor, γ_1, and dividing the two as β_1/γ_1. What is this ratio always equal to?

Your Answer		Score	Explanation
◯ 1			
◯ $2SD(Y)/SD(X)$			
◯ $Cor(Y, X)$			
⦿ $Var(Y)/Var(X)$	✔	1.00	
Total		1.00 / 1.00	