

Task D

Anne

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Question

D. During a field survey 10 frogs were captured, measured (body length and body mass) and released.

Following data were obtained:

Frog	body mass [g]	body length [mm]
1	7	56
2	10	71
3	11	80
4	8	53
5	9	61
6	14	91
7	8	64
8	11	79
9	12	85
10	8	62

Is there any correlation between body mass and length in frogs? What is the proportion of variability shared by the two variables?

Resolution

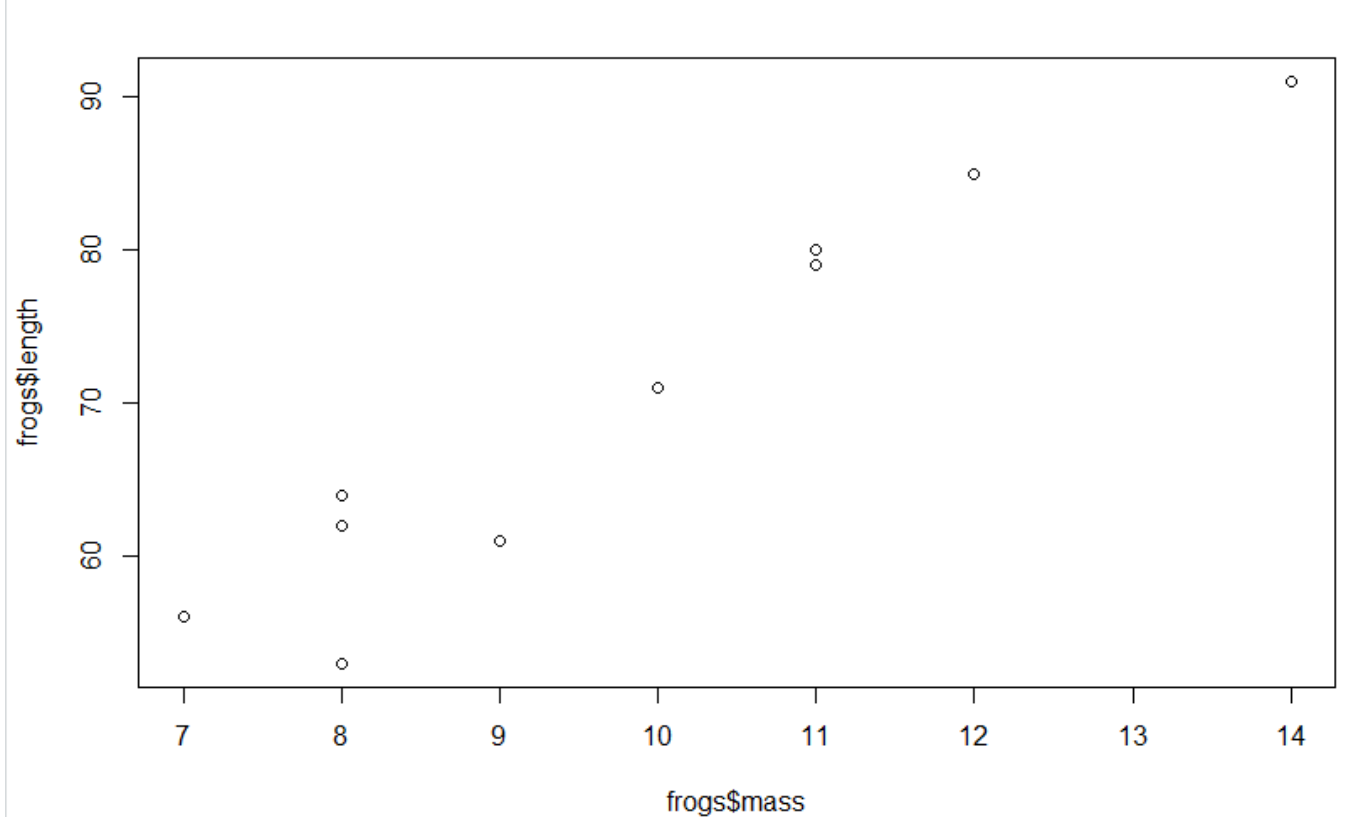
```
> #Task D
> frogs<-read.delim("clipboard")
> summary(frogs)
  mass      length
Min.   : 7.0    Min.   :53.00
1st Qu.: 8.0    1st Qu.:61.25
Median : 9.5    Median :67.50
Mean   : 9.8    Mean   :70.20
3rd Qu.:11.0   3rd Qu.:79.75
Max.   :14.0   Max.   :91.00
> frogs
  mass length
1     7     56
2    10     71
3    11     80
4     8     53
5     9     61
6    14     91
7     8     64
8    11     79
9    12     85
10    8     62
> cor.test(frogs$mass,frogs$length)
```

Pearson's product-moment correlation

```
data: frogs$mass and frogs$length
t = 9.5911, df = 8, p-value = 1.158e-05
alternative hypothesis: true correlation is not equal to 0
95 percent confidence interval:
 0.8319788 0.9905697
sample estimates:
```

```
cor
0.9591619
```

```
> plot(frogs$mass,frogs$length)
```



Resolution

```
> summary(lm(frogs$mass ~ frogs$length))  
Call:  
lm(formula = frogs$mass ~ frogs$length)  
Residuals:  
    Min       1Q   Median       3Q      Max   
-0.7907 -0.4477 -0.2209  0.5407  1.0000  
Coefficients:  
            Estimate Std. Error t value Pr(>|t|)      
(Intercept) -1.62791    1.20967  -1.346   0.215      
frogs$length  0.16279    0.01697   9.591 1.16e-05 ***  
---  
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
Residual standard error: 0.6603 on 8 degrees of freedom  
Multiple R-squared:  0.92,    Adjusted R-squared:  0.91  
F-statistic: 91.99 on 1 and 8 DF, p-value: 1.158e-05
```

- There is correlation between mass and length ($p = 1.158e-05$)
- The proportion of variability shared by mass and length is 0.92 (adjusted = 0.91)