HW2

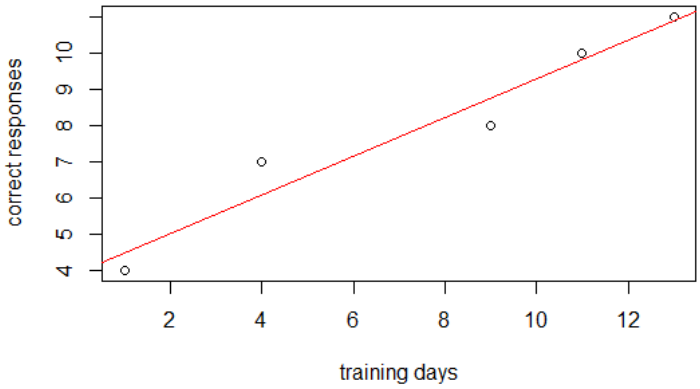
DATA:

Training_Days	Correct_Responses
1	4
2	7
3	8
4	10
5	11

Syntax Input:

```
data1 = read.csv('data1.csv')

data1

dim(data1); head(data1)

#scatterplot of Correct_responses against training_days

plot(Correct_Responses~Training_Days, data=data1, xlab='training days', ylab= 'correct responses')

# correlation coeficient

cor(data1$Correct_Response,data1$Training_Days)

# LS_line

m <- lm(Correct_Responses~Training_Days, data=data1)

abline(m, col = 'red')

summary(m)

#regression coefficients

m$coefficients


# fitted values

round(m$fitted.values,3)

# find the residuals rounded to 3 decimal places

residuals_data1 <- m$residuals

residuals_data1

# residuals standard error

# a) sum of the residuals in 2nd power

SSE <-sum(residuals_data1**2)

# b) DF

DF <- length(residuals_data1)-2

# c) implement the formula for residudals SE

SE <- sqrt(SSE/DF)

round(SE,3)
```

Output:




```
> cor(data1$Correct_Response,data1$Training_Days)
[1] 0.9715371
> # LS_line
> m <- lm(Correct_Responses~Training_Days, data=data1)
> abline(m, col = 'purple')
> abline(m, col = 'red')
> summary(m)

Call:
lm(formula = Correct_Responses ~ Training_Days, data = data1)

Residuals:
      1       2       3       4       5
-0.4738  0.9234 -0.7480  0.1835  0.1149

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)    3.93952    0.66255   5.946  0.00951 **
Training_Days  0.53427    0.07521   7.104  0.00574 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.7491 on 3 degrees of freedom
Multiple R-squared:  0.9439, Adjusted R-squared:  0.9252
F-statistic: 50.46 on 1 and 3 DF,  p-value: 0.00574

> #regression coefficients
> m$coefficients
  (Intercept) Training_Days
    3.9395161     0.5342742
> # fitted values
> M$fitted.values
Error: object 'M' not found
> # fitted values
> m$fitted.values
        1         2         3         4         5
 4.473790  6.076613  8.747984  9.816532 10.885081
> # fitted values
> m$fitted.values.round(3)
Error: attempt to apply non-function
> # fitted values
> round(m$fitted.values,3)
     1      2      3      4      5
 4.474  6.077  8.748  9.817 10.885
> # find the residuals rounded to 3 decimal places
> round(m$residuals,3)
     1      2      3      4      5
-0.474  0.923 -0.748  0.183  0.115
> # variation in residuals
> round(sd.m$residuals,3)
Error: object 'sd.m' not found
> # variation in residuals
> round(sd(m$residuals),3)
```

```
[1] 0.649
> residuals_data1
Error: object 'residuals_data1' not found
> # find the residuals rounded to 3 decimal places
> residuals_data1 <- m$residuals
> residuals_data1
         1          2          3          4          5
-0.4737903  0.9233871 -0.7479839  0.1834677  0.1149194
> # find the residuals rounded to 3 decimal places
> residuals_data1 <- m$residuals
> residuals_data1
         1          2          3          4          5
-0.4737903  0.9233871 -0.7479839  0.1834677  0.1149194
> # residuals standard error
> # a) sum of the residuals in 2nd power
> SSE <-sum(residuals_data1**2)
> # b) DF
> DF <- length(residuals_data1)-2
> # c) implement the formula for residudals SE
> SE <- sqrt(SSE/DF)
> SE
[1] 0.7491034
> # c) implement the formula for residudals SE
> SE <- sqrt(SSE/DF)
> round(SE,3)
[1] 0.749
```