Mental and physical health

GROUP 4

10/19/2022

physical.health<-c(12,23,32,35,14,45,52,24,29,30,16,29)  
physical.health

## [1] 12 23 32 35 14 45 52 24 29 30 16 29

mental.health<-c(10,17,25,34,11,39,48,20,25,30,15,28)  
mental.health

## [1] 10 17 25 34 11 39 48 20 25 30 15 28

xo<-rep.int(1,12)  
xo

## [1] 1 1 1 1 1 1 1 1 1 1 1 1

x<-c(physical.health)  
x

## [1] 12 23 32 35 14 45 52 24 29 30 16 29

y<-c(mental.health)  
y

## [1] 10 17 25 34 11 39 48 20 25 30 15 28

X<-cbind(xo,x)  
X

## xo x  
## [1,] 1 12  
## [2,] 1 23  
## [3,] 1 32  
## [4,] 1 35  
## [5,] 1 14  
## [6,] 1 45  
## [7,] 1 52  
## [8,] 1 24  
## [9,] 1 29  
## [10,] 1 30  
## [11,] 1 16  
## [12,] 1 29

Y<-matrix(c(y),12,1)  
Y

## [,1]  
## [1,] 10  
## [2,] 17  
## [3,] 25  
## [4,] 34  
## [5,] 11  
## [6,] 39  
## [7,] 48  
## [8,] 20  
## [9,] 25  
## [10,] 30  
## [11,] 15  
## [12,] 28

t(X)

## [,1] [,2] [,3] [,4] [,5] [,6] [,7] [,8] [,9] [,10] [,11] [,12]  
## xo 1 1 1 1 1 1 1 1 1 1 1 1  
## x 12 23 32 35 14 45 52 24 29 30 16 29

t(X)%\*%X

## xo x  
## xo 12 341  
## x 341 11261

solve(t(X)%\*%X)

## xo x  
## xo 0.59736884 -0.018089226  
## x -0.01808923 0.000636571

solve(t(X)%\*%X)%\*%t(X)%\*%Y

## [,1]  
## xo -1.6264920  
## x 0.9428678

## fitting a linear model  
health.reg<-lm(y~x)  
health.reg

##   
## Call:  
## lm(formula = y ~ x)  
##   
## Coefficients:  
## (Intercept) x   
## -1.6265 0.9429

summary(health.reg)

##   
## Call:  
## lm(formula = y ~ x)  
##   
## Residuals:  
## Min 1Q Median 3Q Max   
## -3.5453 -1.2024 -0.1308 1.7263 3.3405   
##   
## Coefficients:  
## Estimate Std. Error t value Pr(>|t|)   
## (Intercept) -1.62649 1.78139 -0.913 0.383   
## x 0.94287 0.05815 16.214 1.65e-08 \*\*\*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Residual standard error: 2.305 on 10 degrees of freedom  
## Multiple R-squared: 0.9634, Adjusted R-squared: 0.9597   
## F-statistic: 262.9 on 1 and 10 DF, p-value: 1.652e-08

## computing the correlation  
data1<-data.frame(x,y)  
data1

## x y  
## 1 12 10  
## 2 23 17  
## 3 32 25  
## 4 35 34  
## 5 14 11  
## 6 45 39  
## 7 52 48  
## 8 24 20  
## 9 29 25  
## 10 30 30  
## 11 16 15  
## 12 29 28

cor(x,data1)

## x y  
## [1,] 1 0.9815067