GROUP 3

Thành viên

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EX4.r

Admin

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```
Xi<-c(7,9,9,10,13,17,19,20,21,25)
Yi=c(5,4,6,4,1,2,0,1,1,0)
###Q1
droite4<-lm(Yi~Xi)
coef(droite4)
```

```
## (Intercept)          Xi
##   7.0387283  -0.3092486
```

```
###Q2
predict(droite4,interval = "confidence", level = 0.99)
```

```
##        fit       lwr      upr
## 1  4.8739884  2.9416537 6.806323
## 2  4.2554913  2.6203841 5.890599
## 3  4.2554913  2.6203841 5.890599
## 4  3.9462428  2.4439069 5.448579
## 5  3.0184971  1.8094658 4.227528
```

```
## 6    1.7815029  0.5724716 2.990534
## 7    1.1630058 -0.2212590 2.547271
## 8    0.8537572 -0.6485786 2.356093
## 9    0.5445087 -1.0905986 2.179616
## 10 -0.6924855 -2.9501865 1.565215
```

```
###Q3
#E(Yi|X=10)
predict(droite4, list(Xi=10))
```

```
##        1
## 3.946243
```

```
#Var(Yi|X=10)
```

```
###Q4
sum_Yi = sum(Yi)
sum_Y_chapeau = sum(fitted(droite4))
```

```
###Q5
EX4<-data.frame(Xi,Yi)
t.test(EX4)
```

```
##
##  One Sample t-test
##
## data:  EX4
## t = 4.9325, df = 19, p-value = 9.245e-05
## alternative hypothesis: true mean is not equal to 0
## 95 percent confidence interval:
##   5.008287 12.391713
## sample estimates:
## mean of x
##      8.7
```

```
###Q6
```
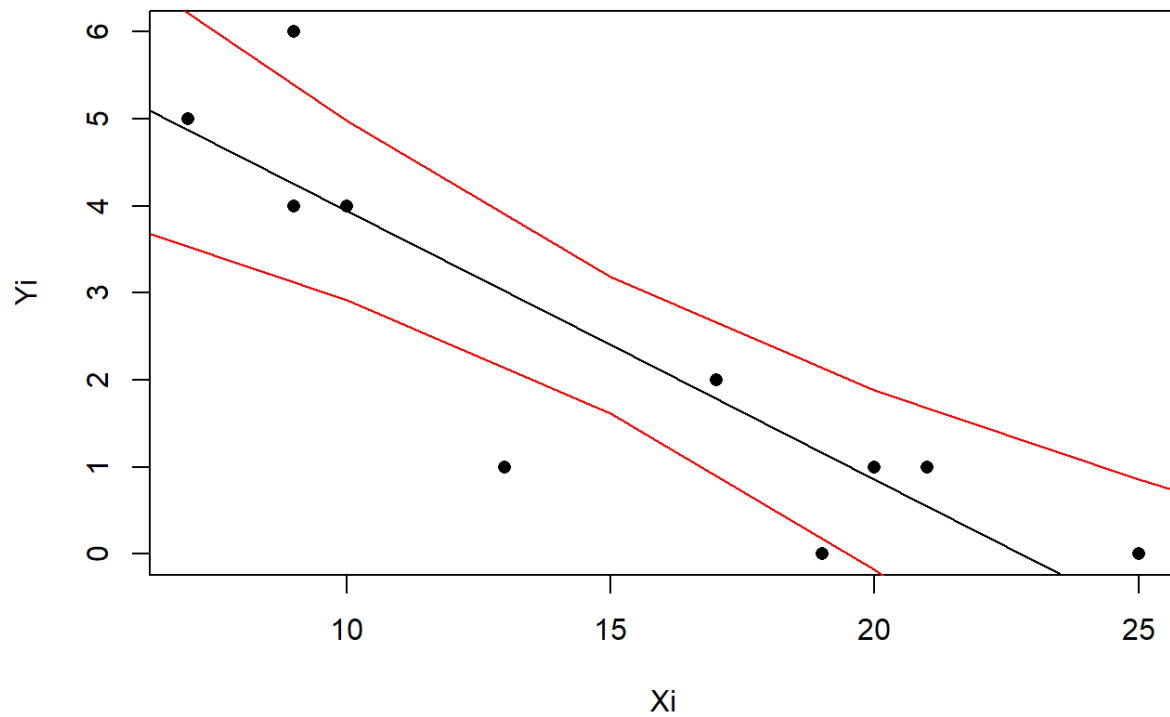
```
reg <- lm(Yi ~ Xi)
```

```
new <- data.frame(Xi = seq(0, 30, 5))
pred.w.clim <- predict(reg, new, interval="confidence", level = 0.95)


resc <- cbind(pred.w.clim, new)
plot(Yi ~ Xi, pch=16)


lines(resc$fit ~ resc$X)
lines(resc$lwr ~ resc$X, col=2)
lines(resc$upr ~ resc$X, col=2)
```
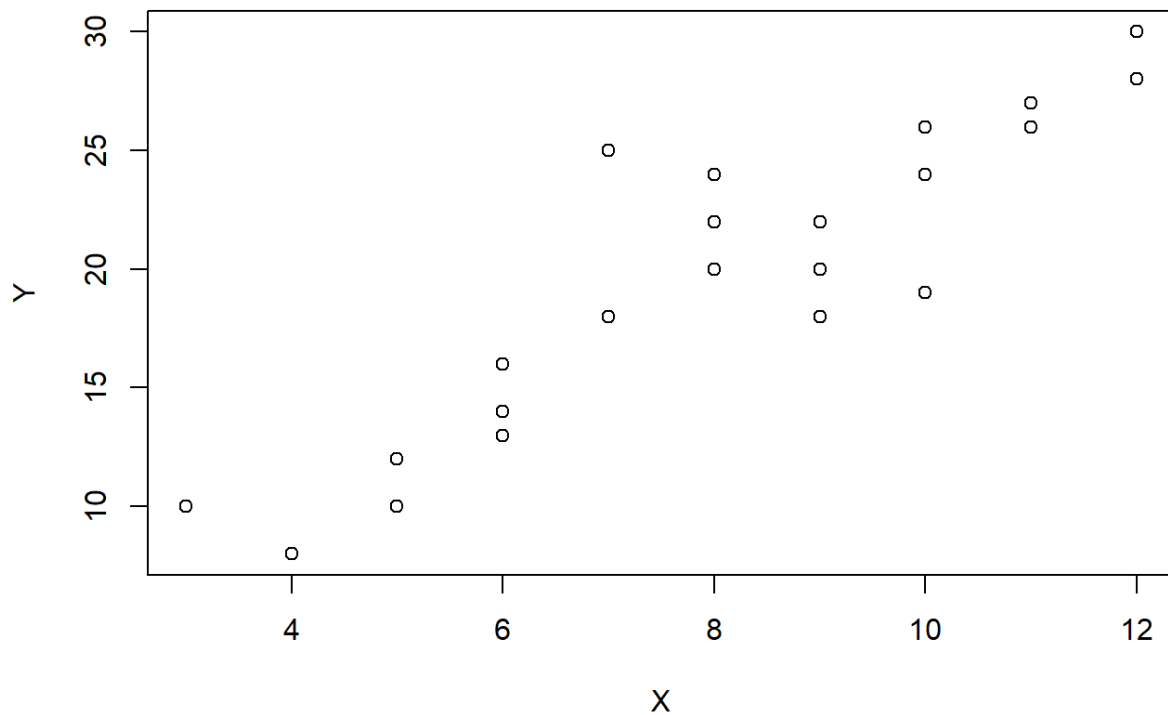
EX5.r

Admin

2020-04-18

```r
Y=c(10,18,24,22,27,13,10,24,25,8,16,20,28,22,19,18,26,14,20,26,30,12)
X<-c(3,7,10,9,11,6,5,8,7,4,6,9,12,8,10,9,11,6,8,10,12,5)


###Q1: Y est cout direct, X est nombre de mois


###Q2
plot(X,Y) #Non, parce que plusieurs le cout direct pour une meme valeur de
nombre de mois
```



```r
###Q3
droite5<-lm(Y~X)
coef(droite5) ##->Yi = 1.549407 + 2.260870Xi
```

```
## (Intercept)              X
##     1.549407     2.260870
```

```
fitted(droite5)
```

```
##          1         2         3         4         5         6         7
8
##   8.332016 17.375494 24.158103 21.897233 26.418972 15.114625 12.853755
19.636364
##          9        10        11        12        13        14        15
16
## 17.375494 10.592885 15.114625 21.897233 28.679842 19.636364 24.158103
21.897233
##         17        18        19        20        21        22
## 26.418972 15.114625 19.636364 24.158103 28.679842 12.853755
```

###Q4

```
predict(droite5, list(X=6))
```

```
##        1
## 15.11462
```

###Q5 :

```
EX5<-data.frame(X,Y)
```

```
y_bar = mean(Y)
```

```
y_bar
```

```
## [1] 19.63636
```

###Q6

```
anova(droite5)
```

```
## Analysis of Variance Table
##
## Response: Y
##            Df Sum Sq Mean Sq F value    Pr(>F)
## X           1 705.39  705.39   88.34 8.879e-09 ***
## Residuals 20 159.70    7.98
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
SCtotal = 705.39 + 159.70
```

```
fitted(droite5)
```

```
##         1         2         3         4         5         6         7
8
##  8.332016 17.375494 24.158103 21.897233 26.418972 15.114625 12.853755
19.636364
##         9        10        11        12        13        14        15
16
## 17.375494 10.592885 15.114625 21.897233 28.679842 19.636364 24.158103
21.897233
##        17        18        19        20        21        22
## 26.418972 15.114625 19.636364 24.158103 28.679842 12.853755
```

```
resid(droite5)
```

```
##          1          2          3          4          5          6
7
##  1.6679842  0.6245059 -0.1581028  0.1027668  0.5810277 -2.1146245 -
2.8537549
##          8          9         10         11         12         13
14
##  4.3636364  7.6245059 -2.5928854  0.8853755 -1.8972332 -0.6798419
2.3636364
##         15         16         17         18         19         20
21
## -5.1581028 -3.8972332 -0.4189723 -1.1146245  0.3636364  1.8418972
1.3201581
##         22
## -0.8537549
```

```
summary(droite5) #R^2 = 0.8154. Plus coefficient de détermination est proche
de 1, les données sont alignées sur la droite de régression.
```

```
##
## Call:
## lm(formula = Y ~ X)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -5.1581 -1.7016 -0.0277  1.2115  7.6245
##
```

```
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)   1.5494     2.0165   0.768    0.451
## X             2.2609     0.2405   9.399 8.88e-09 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2.826 on 20 degrees of freedom
## Multiple R-squared:  0.8154, Adjusted R-squared:  0.8062
## F-statistic: 88.34 on 1 and 20 DF,  p-value: 8.879e-09
```

EX6.r

Admin

2020-04-18

```
X<-c(1.73, 1.73, 1.83, 1.84, 1.84, 1.78, 1.84, 1.85, 1.85, 1.86, 1.85, 1.91,
1.87, 1.96, 1.88, 1.94, 1.85, 2.00, 1.94, 2.01)
Y=c(2.32, 2.31, 2.40, 2.40, 2.40, 2.33, 2.37, 2.37, 2.37, 2.37, 2.36, 2.41,
2.36, 2.45, 2.36, 2.39, 2.28, 2.42, 2.35, 2.40)
###Q1
droite6<-lm(Y~X)
coef(droite6)
```

```
## (Intercept)           X
##   1.7312459   0.3424808
```

```
fitted(droite6)
```

```
##        1        2        3        4        5        6        7        8
## 2.323738 2.323738 2.357986 2.361411 2.361411 2.340862 2.361411 2.364835
##        9       10       11       12       13       14       15       16
## 2.364835 2.368260 2.364835 2.385384 2.371685 2.402508 2.375110 2.395659
##       17       18       19       20
## 2.364835 2.416207 2.395659 2.419632
```

```
resid(droite6)
```

```
##            1            2            3            4            5
6
## -0.003737651 -0.013737651  0.042014270  0.038589462  0.038589462 -
0.010861690
##            7            8            9           10           11
12
##  0.008589462  0.005164654  0.005164654  0.001739846 -0.004835346
0.024615807
##           13           14           15           16           17
18
## -0.011684962  0.047491767 -0.015109769 -0.005658617 -0.084835346
0.003792536
##           19           20
## -0.045658617 -0.019632272
```

Q2

```
anova(droite6)
```

```
## Analysis of Variance Table
##
## Response: Y
##           Df    Sum Sq    Mean Sq F value    Pr(>F)
## X          1 0.012823 0.0128225   12.711 0.002212 **
## Residuals 18 0.018158 0.0010088
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
SCtotal = 0.012823 + 0.018158
# SCreg:  0.012823    1    0.012823
# SCres:  0.018158    18   0.02118333
# totale: 0.030981    19
# F     : 12.71142
```

Q3

```
summary(droite6) #ce pourcentage est de 41.39%
```

```
##
## Call:
## lm(formula = Y ~ X)
##
```

```
## Residuals:
##       Min        1Q    Median        3Q       Max
## -0.084835 -0.012198 -0.000999  0.012596  0.047492
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  1.73125    0.17958   9.641 1.56e-08 ***
## X            0.34248    0.09606   3.565  0.00221 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.03176 on 18 degrees of freedom
## Multiple R-squared:  0.4139, Adjusted R-squared:  0.3813
## F-statistic: 12.71 on 1 and 18 DF,  p-value: 0.002212
```
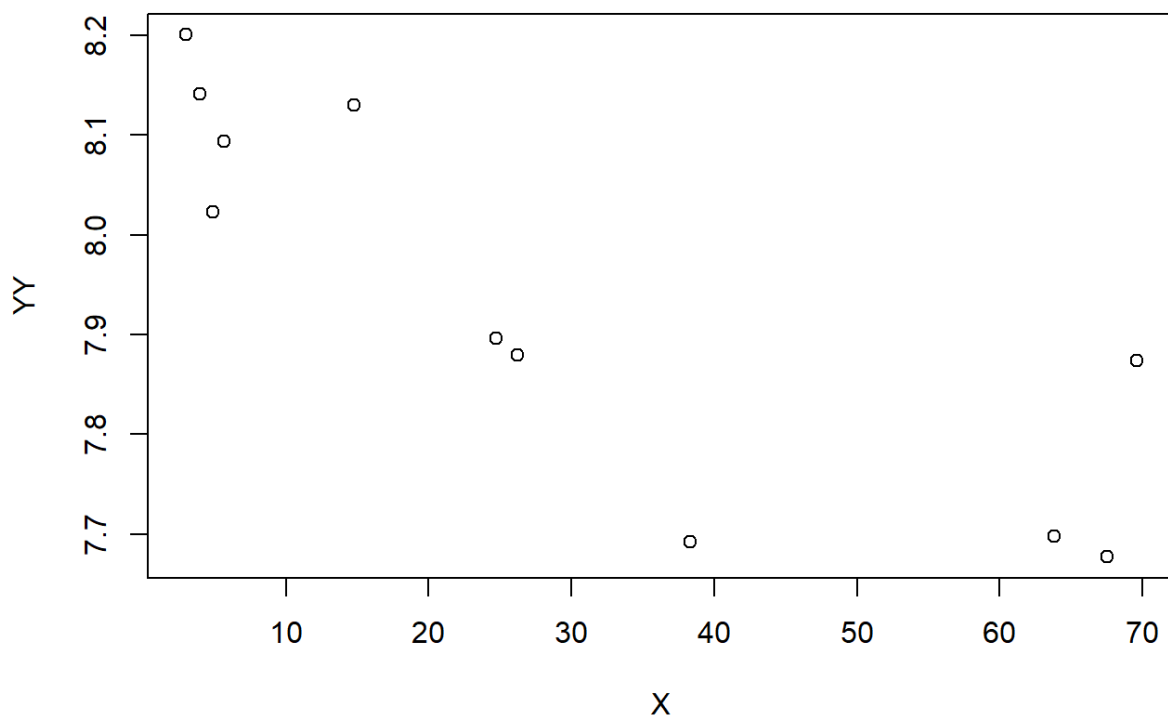
EX7.r

Admin

2020-04-18

```r
X<-c(4.0,5.7,4.9,3.0,14.8,69.6,63.8,26.2,38.3,24.7,67.5)
Y=c(3432,3273,3049,3642,3394,2628,2204,2643,2192,2687,2159)
EX7BIS<-data.frame(X=X,YY=log(Y))


###Q1
plot(EX7BIS)
```



```r
###Q2
droite7<-lm(YY~X,data=EX7BIS)
```

```
coef(droite7)
```

```
##   (Intercept)              X
##  8.115673963 -0.006101095
```

```
anova(droite7)
```

```
## Analysis of Variance Table
##
## Response: YY
##            Df  Sum Sq  Mean Sq F value   Pr(>F)
## X           1 0.26353 0.263530  21.661 0.001195 **
## Residuals   9 0.10949 0.012166
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
# SCreg:  0.26353    1    0.26353
# SCres:  0.10949    9    0.012166
# totale: 0.37302    10
# F     :  21.661
```

```
confint(droite7, level = 0.95)
```

```
##                     2.5 %        97.5 %
## (Intercept)  8.000701144   8.230646781
## X           -0.009066554  -0.003135636
```

```
reg <- lm(Y ~ X)
new <- data.frame(X = seq(0, 100, 5))
pred.w.clim <- predict(reg, new, interval="confidence", level = 0.95)

resc <- cbind(pred.w.clim, new)
plot(Y ~ X, pch=16)

lines(resc$fit ~ resc$X)
lines(resc$lwr ~ resc$X, col=2)
lines(resc$upr ~ resc$X, col=2)
```