GROUP 3

Thành viên

Nguyễn Thị Thùy Trang	1752048
Nguyễn Minh Nguyệt	1752038
Trương Thanh Trúc	1752051
Nguyễn Anh Khôi	1752024
Đặng Hữu Phước Vinh	1752052
Nguyễn Hoàng Long	1752028

EX4_TP2.r

Admin

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```
EX4<-read.csv(file.choose())
mydata <-data.frame(EX4)


##Q1
droite_X1 <- lm(Y~X_1, data=mydata)
coef(droite_X1)
## (Intercept)          X_1
##  46.2363328   0.1200212
qt(1-0.05/2,20)
## [1] 2.085963
summary(droite_X1)
##
## Call:
## lm(formula = Y ~ X_1, data = mydata)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -24.157 -14.190  -2.637  12.219  32.762
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
```

```
## (Intercept) 46.23633    5.77111   8.012 1.14e-07 ***
## X_1          0.12002    0.05044   2.379   0.0274 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 17.47 on 20 degrees of freedom
## Multiple R-squared:  0.2206, Adjusted R-squared:  0.1817
## F-statistic: 5.662 on 1 and 20 DF,  p-value: 0.02741
#Tobs = 2.379 > 2.085963 => rejetter H0


##Q2
#Y_chapeau = B0_chapeau + B1_chapeau*X1 + B2_chapeau*X2
droite_X1X2<- lm(Y~X_1+X_2, data=mydata)
coef(droite_X1X2)
## (Intercept)         X_1         X_2
## 35.55464170  0.07895034  0.47072920
#b0_chapeau = 35.55464170
#B1_chapeau = 0.07895034
#B2_chapeau = 0.47072920
#=>Y_chapeau = 35.55464170 + 0.07895034*X1 + 0.47072920*X2


##Q3
anova(droite_X1X2)
## Analysis of Variance Table
##
## Response: Y
##           Df Sum Sq Mean Sq F value  Pr(>F)
## X_1        1 1727.2 1727.16  5.5132 0.02985 *
## X_2        1  148.9  148.92  0.4753 0.49887
## Residuals 19 5952.3  313.28
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
MCreg = (1727.2+148.9)/2
Fobs = MCreg / 313.28
qf(0.95,2,19)
## [1] 3.521893
#=> Fobs > 3.521893 => rejetter H0
```

```
##Q4
summary(droite_X1X2)
##
## Call:
## lm(formula = Y ~ X_1 + X_2, data = mydata)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -22.311 -13.582  -3.174  14.342  32.402
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 35.55464   16.56005   2.147   0.0449 *
## X_1          0.07895    0.07849   1.006   0.3271
## X_2          0.47073    0.68276   0.689   0.4989
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 17.7 on 19 degrees of freedom
## Multiple R-squared:  0.2397, Adjusted R-squared:  0.1596
## F-statistic: 2.994 on 2 and 19 DF,  p-value: 0.07407
#R^2= 0.2397, cette equation a significative ameliorer l'estimation


##Q5
droite<-lm(Y~X_1+X_2+X_3, data=mydata)
coef(droite)
##  (Intercept)          X_1          X_2          X_3
## 23.999566149 -0.006173447 -0.479869473  8.483500169
#Y_chapeau = 23.999566149 - 0.006173447*X1 - 0.479869473*X2 +
8.483500169*X3


##Q6
confint(droite)[4,]
##     2.5 %    97.5 %
##  0.402924 16.564076
#pour beta3: [0.402924, 16.5640763]
```

```
##Q7
predict(droite, list(X_1 = 221, X_2 = 39, X_3 = 7), interval =
"confidence", level = 0.95)
##        fit      lwr      upr
## 1 63.30483 46.06349 80.54616
##Q8
summary(droite)
##
## Call:
## lm(formula = Y ~ X_1 + X_2 + X_3, data = mydata)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -24.134 -10.675  -1.435   9.321  29.800
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) 23.999566  15.978866   1.502   0.1504
## X_1         -0.006173   0.081298  -0.076   0.9403
## X_2         -0.479869   0.757034  -0.634   0.5341
## X_3          8.483500   3.846205   2.206   0.0406 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 16.13 on 18 degrees of freedom
## Multiple R-squared:  0.4014, Adjusted R-squared:  0.3017
## F-statistic: 4.024 on 3 and 18 DF,  p-value: 0.02357
#R^2= 0.4014, cette equation a significative ameliorer l'estimation


##Q9
droiteX1_X2X3<-lm(X_1~X_2+X_3, data = mydata)
coef(droiteX1_X2X3)
## (Intercept)         X_2         X_3
## -117.910264    2.596946   22.458574
##Q10
droiteX1_X3<-lm(X_1~X_3, data = mydata)
```

```r
cor.test(mydata$X_3,mydata$X_1)
```

```
##
##  Pearson's product-moment correlation
##
## data:  mydata$X_3 and mydata$X_1
## t = 6.0123, df = 20, p-value = 7.051e-06
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  0.5754128 0.9145856
## sample estimates:
##       cor
## 0.8023677
```

```r
#L'intervalle de confiance a 95% : [0.5754128 ; 0.9145856]
```