```r
# telecharger les donnees dans R
m = read.table("U:/Documents/eco2324/11623991.txt")
m = read.table("U:/Documents/eco2324/11623991.txt", header = T)
# simplifier les noms des variables
X = m$X; Y = m$Y; Z = m$Z; U = m$U; V = m$V;
# Q1
# Mod1 : y = b*x^a --> log(y)=log(b)+a*log(x) : lm(log(Y)~log(X)) -->
log(Y) = mu+beta*log(X)
reg1 = lm(log(Y)~log(X)); summary(reg1)
# commentaire sur les sorties de summary()
# Intercept = mu_chapeau = log(b)_chapeau = 1.65578 --> b_chapeau =
exp(1.65578)
# log(X) = beta_chapeau = a_chapeau = 1.03210
# Modele Log-lineaire estime : Y_chapeau = exp(1.65578)*X^1.03210
# Tests : Ils sont tous significatifs
# Mod2 : N = X*X , lm(Y~N)
N = X*X ; reg2 = lm(Y~N); summary(reg2)
# Modele Parabolique estime : Y_chapeau = 0.52105*X*X+10.46297
# Mod3
reg3 = lm(Y~X); summary(reg3)
# Modele lineaire estime : Y_chapeau = 6.8470*X
# R2_mod1 = 0.8432, R2_mod2 = 0.9525, R2_mod3 = 0.9254
par(mfrow = c(3,3))
plot(reg1, which = 1); plot(reg2, which = 1); plot(reg3, which = 1)
plot(reg1, which = 2); plot(reg2, which = 2); plot(reg3, which = 2)
plot(reg1, which = 3); plot(reg2, which = 3); plot(reg3, which = 3)
# Les differences ne sont pas evidentes d'apres les graphiques.
# Donc nous allons calculer pseudo_R2 pour mod1
y_chapeau = exp(reg1$fitted.values);
1-sum((y_chapeau-Y)^2)/sum((Y-mean(Y))^2) # pseudo_R2 pour mod1
# R2_mod1 = 0.8432(pseudo_R2 = 0.8963818), R2_mod2 = 0.9525, R2_mod3 =
0.9254

getwd() # Recupere le repertoire courant
setwd("/chemin/Donnees") # changer le repertoire courant
# Q3 : a_chapeau = 0.52105
a_chapeau = 0.52105 ; a_0 = 0+1; t_chapeau = (a_chapeau-a_0)/0.02538
pt(t_chapeau, 21)

# test bilateral
t_chapeau = abs(a_chapeau-a_0)/0.02538
2*(1-pt(t_chapeau, 21))
##
newdata=data.frame(X=16)
pre1 = predict(mod1,newdata,interval="prediction", data = m)
con1 = predict(mod1,newdata,interval="confidence", data = m)
newdata2=data.frame(N=16*16)
pre2 = predict(mod2,newdata2,interval="prediction")
con2 = predict(mod2,newdata2,interval="confidence")
pre3 = predict(mod3,newdata,interval="prediction")
con3 = predict(mod3,newdata,interval="confidence")
pre1;con1
pre2;con2
pre3;con3
```