GAMWOOD

Alix Rigal

2023-11-18

Contents

1 Une première lecture de WOOD 2016

2 package utilisé

-gamair : Data sets and scripts used in the book 'Generalized Additive Models: An Introduction with R

#Generalised additive model an introduction S Wood #debut au chap 2 LMM

```
require(gamair)
```

```
## Le chargement a nécessité le package : gamair
```

```
data(stomata)

m1 <- lm(area ~ CO2 + tree, stomata)
summary(m1)
```

```
##
## Call:
## lm(formula = area ~ CO2 + tree, data = stomata)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.30672 -0.10625 -0.01528  0.08436  0.37674
##
## Coefficients: (1 not defined because of singularities)
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  1.62337    0.10932  14.850 1.52e-11 ***
## CO22         0.70639    0.15460   4.569 0.000238 ***
## tree2       -0.02473    0.15460  -0.160 0.874685
## tree3       -0.46041    0.15460  -2.978 0.008059 **
## tree4        0.45948    0.15460   2.972 0.008166 **
## tree5        0.57378    0.15460   3.711 0.001597 **
## tree6             NA         NA      NA       NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
## Residual standard error: 0.2186 on 18 degrees of freedom
## Multiple R-squared:  0.9215, Adjusted R-squared:  0.8997
## F-statistic: 42.24 on 5 and 18 DF,  p-value: 2.511e-09
```

```
m0 <- lm(area ~ CO2, stomata)
summary(m0)
```

```
##
## Call:
## lm(formula = area ~ CO2, data = stomata)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.59027 -0.19824  0.07775  0.17333  0.48769
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  1.46166    0.08992  16.254 9.66e-14 ***
## CO22         1.21252    0.12717   9.534 2.85e-09 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3115 on 22 degrees of freedom
## Multiple R-squared:  0.8051, Adjusted R-squared:  0.7963
## F-statistic: 90.91 on 1 and 22 DF,  p-value: 2.853e-09
```

```
anova(m0,m1)
```

```
## Analysis of Variance Table
##
## Model 1: area ~ CO2
## Model 2: area ~ CO2 + tree
##   Res.Df    RSS Df Sum of Sq      F   Pr(>F)
## 1     22 2.1348
## 2     18 0.8604  4    1.2744 6.6654 0.001788 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
m2 <- lm(area ~ tree, stomata)
anova(m2,m1)
```

```
## Analysis of Variance Table
##
## Model 1: area ~ tree
## Model 2: area ~ CO2 + tree
##   Res.Df    RSS Df  Sum of Sq F Pr(>F)
## 1     18 0.8604
## 2     18 0.8604  0 2.2204e-16
```

conclusion on ne peut pas conclure à un effet du CO2 ou des arbres qui soit significatif etant donné que les données sont dépendantes de l'arbre en question seul le model contenant les deux effet donne de bon resultat selon fisher