

correction td3 ISV51 - facteur

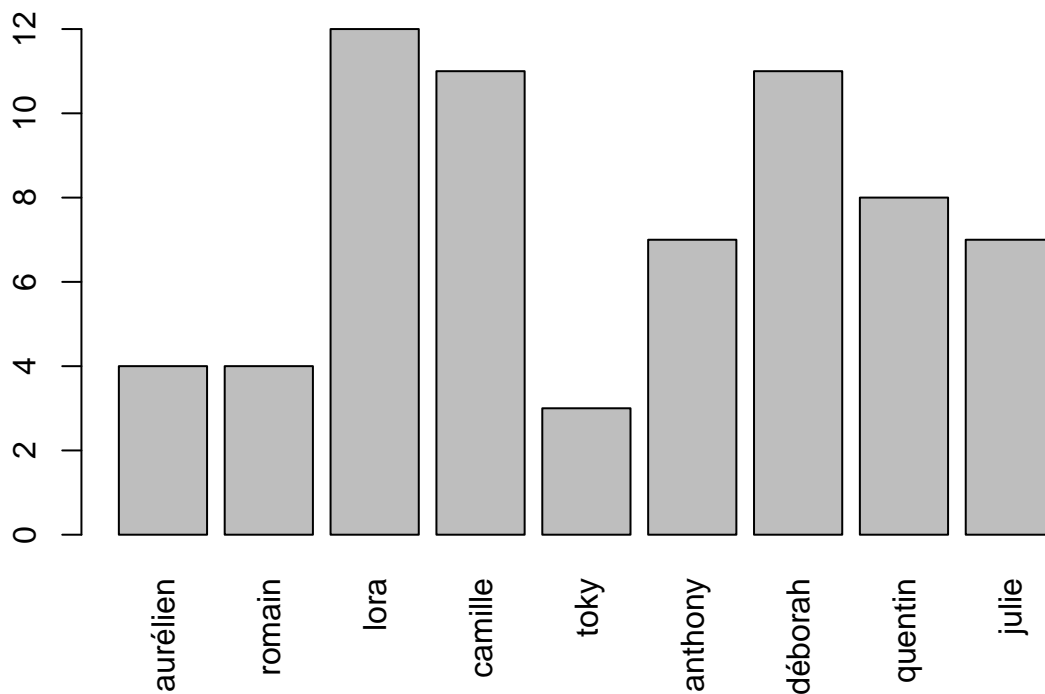
exercice 1 : manipulation de facteurs

1. Mois et semestres de naissance

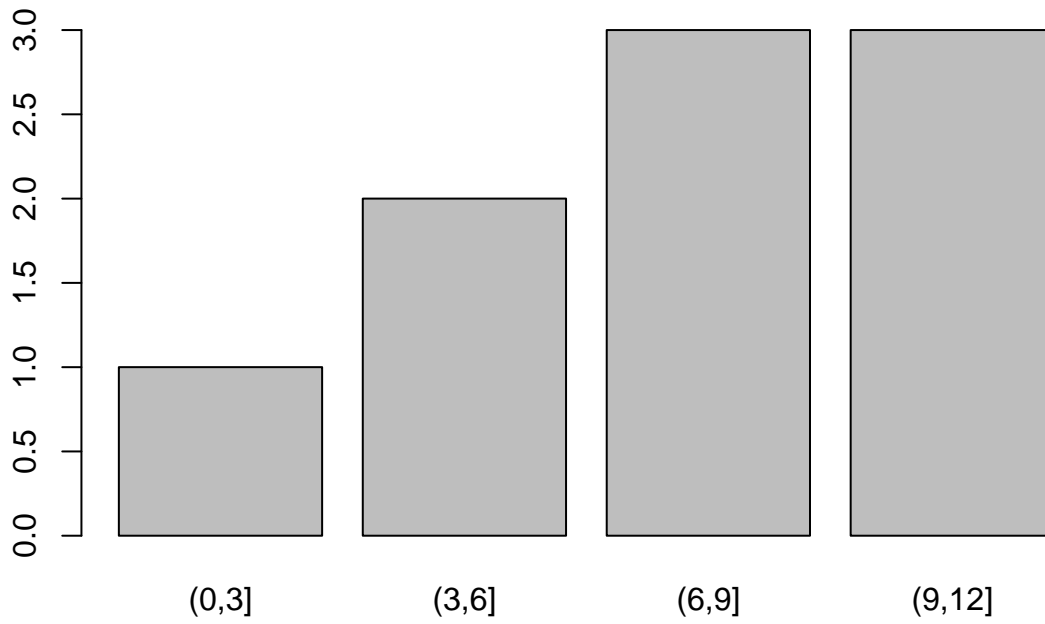
```
mois <- c(4,4,12,11,3,7,11,8,7)
names(mois) <- c("aurélien", "romain", "lora", "camille", "toky", "anthony", "déborah", "quentin", "julie")
semestre <- cut(mois,c(0,3,6,9,12))
split(mois, semestre)
```

```
## $(0,3]`
## toky
## 3
##
## $(3,6]`
## aurélien romain
## 4 4
##
## $(6,9]`
## anthony quentin julie
## 7 8 7
##
## $(9,12]`
## lora camille déborah
## 12 11 11
```

```
barplot(mois, las=3)
```

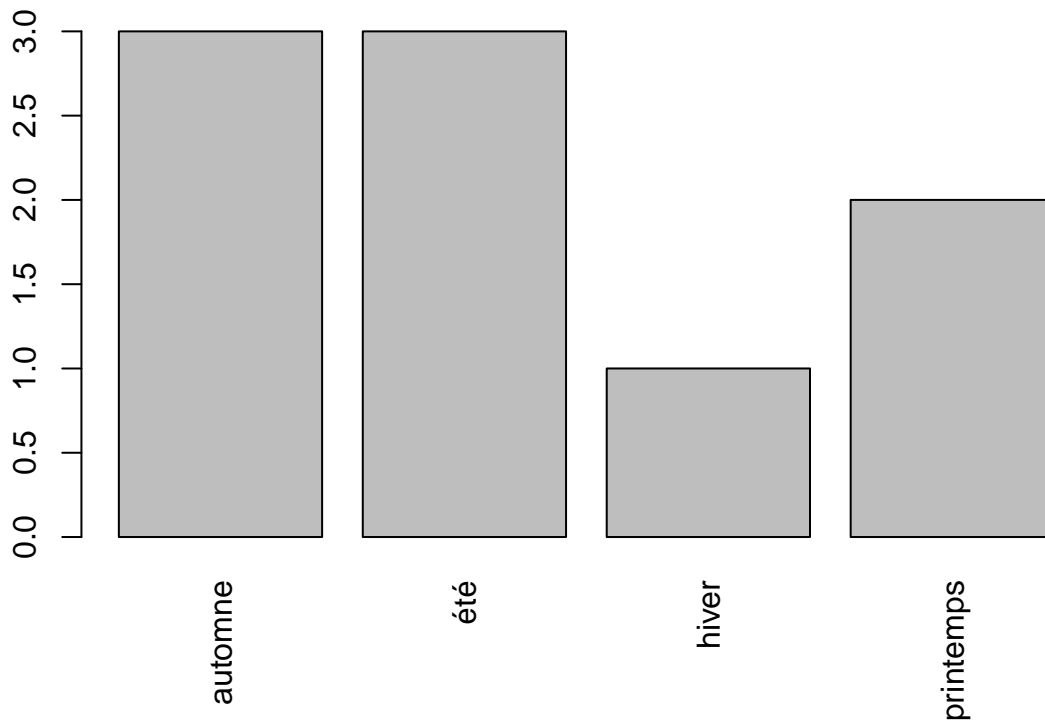


```
barplot(table(semestre))
```



2. Saisons

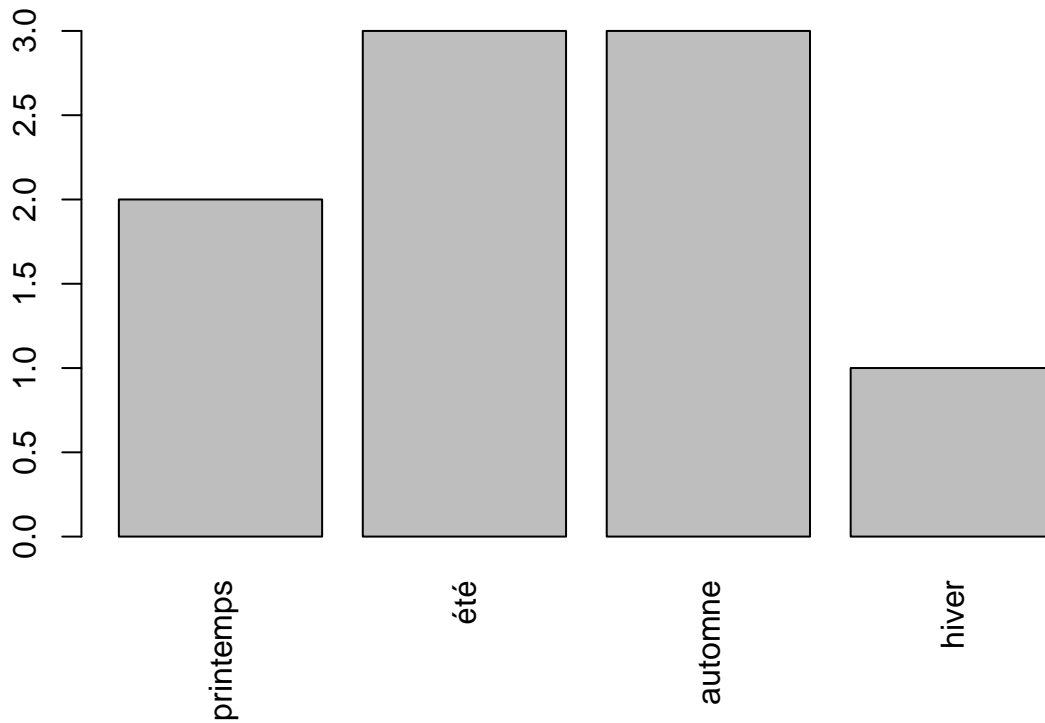
```
saison <- c("printemps", "printemps", "automne", "automne", "hiver", "été", "automne", "été", "été")  
names(saison) <- names(mois)  
barplot(table(saison), las=3)
```



```

saison <- factor(saison, levels=c("printemps","été","automne","hiver"), ordered=TRUE)
barplot(table(saison),las=3)

```



3. Catégorie "sexe"

```

sexe <- factor(c("H","H","F","F","H","H","F","H","F"))
mois <- factor(mois, levels=1:12, ordered=TRUE)
table(sexe,saison)

```

```

##      saison
## sexe printemps été automne hiver
##   F           0  1         3     0
##   H           2  2         0     1

```

```
table(sexe,mois)
```

```

##      mois
## sexe 1 2 3 4 5 6 7 8 9 10 11 12
##   F 0 0 0 0 0 0 1 0 0 0 2 1
##   H 0 0 1 2 0 0 1 1 0 0 0 0

```

```
split(sexe, saison)
```

```

## $printemps
## [1] H H
## Levels: F H
##

```

```
## $été
## [1] H H F
## Levels: F H
##
## $automne
## [1] F F F
## Levels: F H
##
## $hiver
## [1] H
## Levels: F H
```

```
split(saison, sexe)
```

```
## $F
##   lora camille déborah   julie
##  automne automne automne   été
## Levels: printemps < été < automne < hiver
##
## $H
##  aurélien   romain       toky   anthony   quentin
## printemps printemps   hiver     été     été
## Levels: printemps < été < automne < hiver
```

4. Notes -> âge

```
age <- c(21,21,22,22,19,20,21,21,20)
donnees <- data.frame(mois, age, semestre, sexe, saison)
ordre.alpha <- order(rownames(donnees))
donnees.tri <- donnees[ordre.alpha, ]
with(donnees.tri, tapply(age, saison, mean))
```

```
## printemps   été   automne   hiver
## 21.00000 20.33333 21.66667 19.00000
```

```
with(donnees.tri, tapply(age, sexe, mean))
```

```
##   F   H
## 21.25 20.40
```

exercice 2: rendement de différentes variétés d'orge

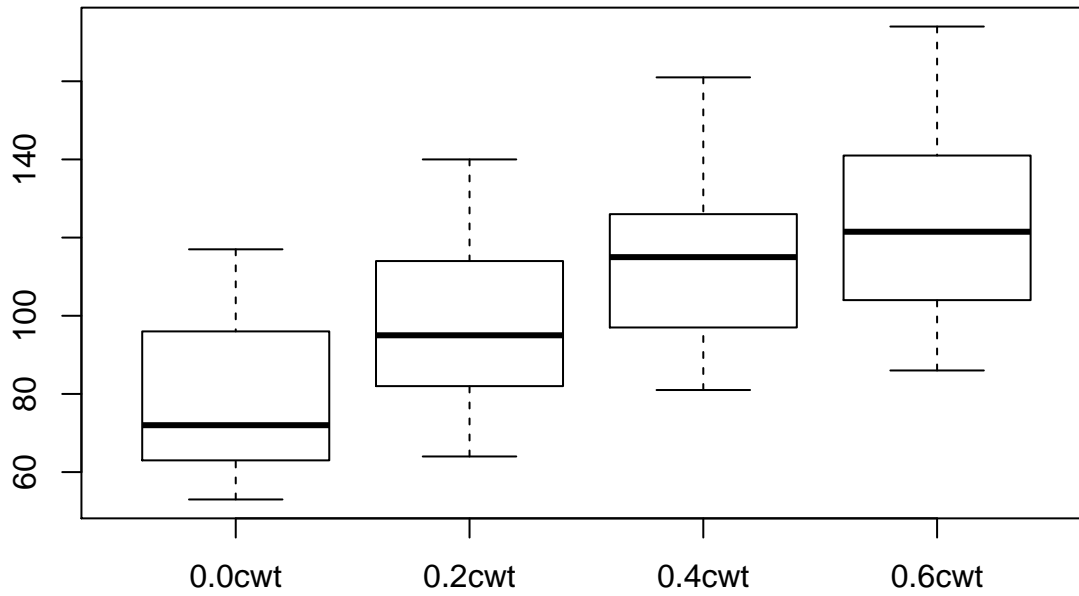
1. représentation graphique

```
engrais <- factor(engrais, ordered=TRUE)
variete <- factor(variete)
table(engrais,variete)
```

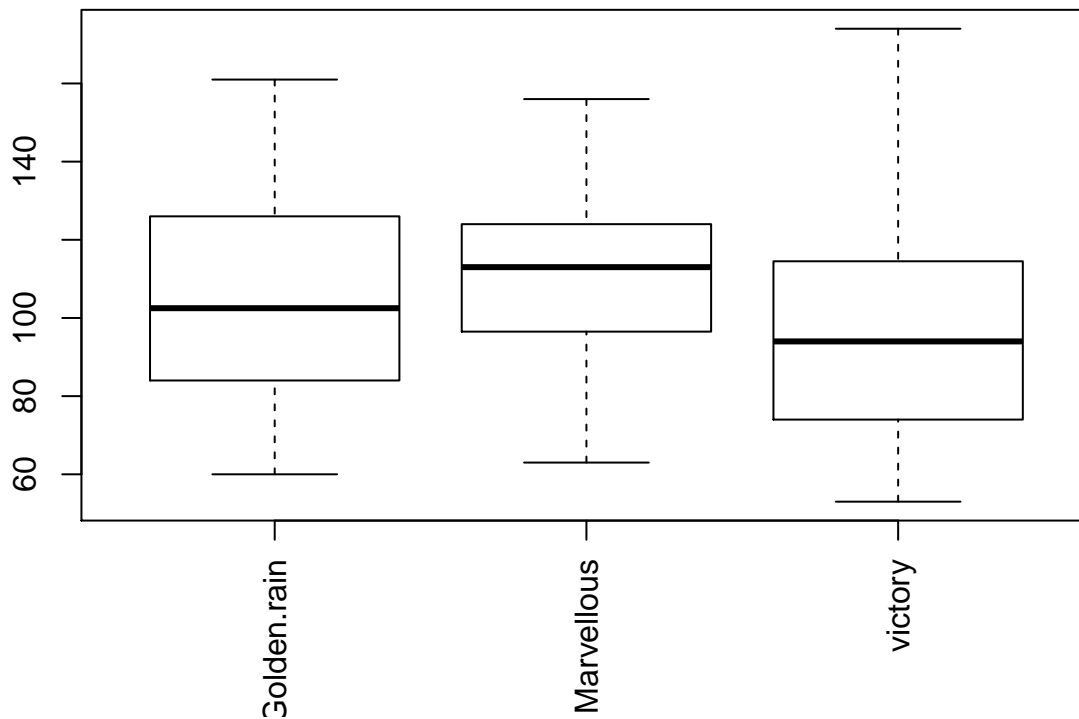
```
##           variete
## engrais Golden.rain Marvellous victory
```

```
## 0.0cwt      6      6      6
## 0.2cwt      6      6      6
## 0.4cwt      6      6      6
## 0.6cwt      6      6      6
```

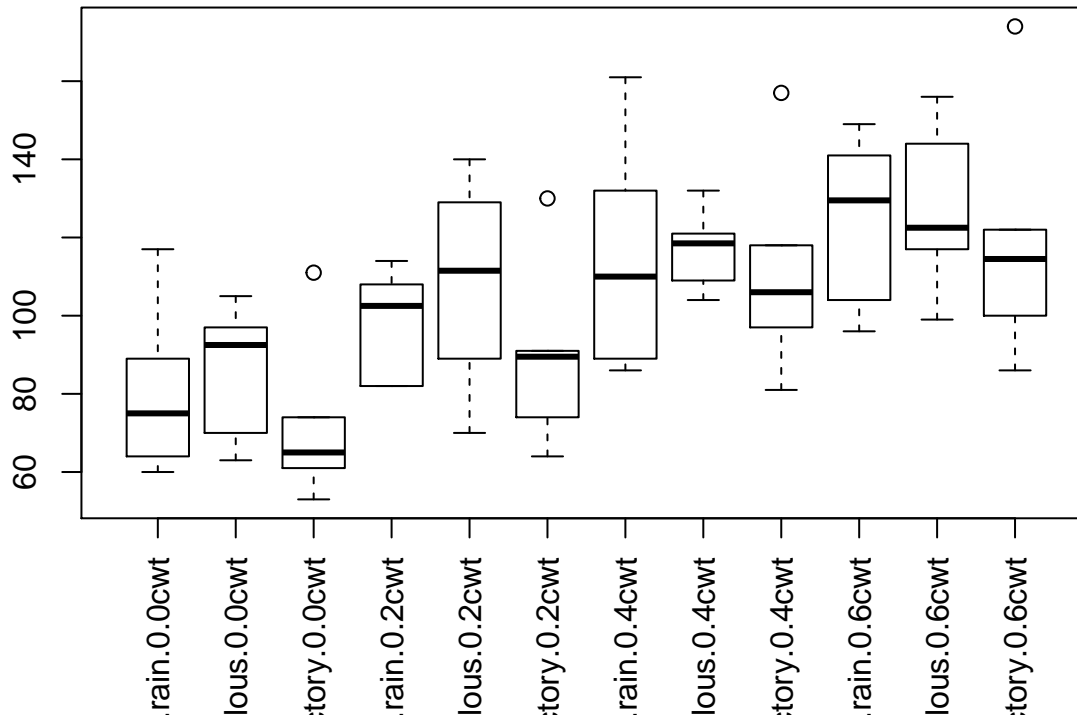
```
boxplot(rendement~engrais)
```



```
boxplot(rendement~variete, las=3)
```



```
boxplot(rendement~variete*engrais, las=3)
```



2. Exécution conditionnelle

```
tapply(rendement, variete, mean)
```

```
## Golden.rain Marvellous victory  
## 104.5000 109.7917 97.6250
```

```
tapply(rendement, engrais, mean)
```

```
## 0.0cwt 0.2cwt 0.4cwt 0.6cwt  
## 79.38889 98.88889 114.22222 123.38889
```

```
tapply(rendement, list(variete,engrais), mean)
```

```
## 0.0cwt 0.2cwt 0.4cwt 0.6cwt  
## Golden.rain 80.00000 98.50000 114.6667 124.8333  
## Marvellous 86.66667 108.50000 117.1667 126.8333  
## victory 71.50000 89.66667 110.8333 118.5000
```

```
tapply(rendement, variete, summary)
```

```
## $Golden.rain  
## Min. 1st Qu. Median Mean 3rd Qu. Max.  
## 60.0 85.0 102.5 104.5 126.0 161.0
```

```
##
## $Marvellous
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  63.00  96.75 113.00 109.80 124.00 156.00
##
## $victory
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  53.00  74.00  94.00  97.62 113.80 174.00
```

```
tapply(rendement, engrais, summary)
```

```
## $`0.0cwt`
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  53.00  63.25  72.00  79.39  94.25 117.00
##
## $`0.2cwt`
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  64.00  83.75  95.00  98.89 112.50 140.00
##
## $`0.4cwt`
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  81.00  97.75 115.00 114.20 124.80 161.00
##
## $`0.6cwt`
##   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  86.0  106.2 121.5 123.4 139.0 174.0
```

```
tapply(rendement, list(variete, engrais), summary)
```

```
##           0.0cwt  0.2cwt  0.4cwt  0.6cwt
## Golden.rain Numeric,6 Numeric,6 Numeric,6 Numeric,6
## Marvellous  Numeric,6 Numeric,6 Numeric,6 Numeric,6
## victory     Numeric,6 Numeric,6 Numeric,6 Numeric,6
```

3. a)

```
table(engrais)
```

```
## engrais
## 0.0cwt 0.2cwt 0.4cwt 0.6cwt
##    18    18    18    18
```

```
table(variete)
```

```
## variete
## Golden.rain Marvellous  victory
##           24           24           24
```

```
table(variete, engrais)
```

```
##          engrais
## variete    0.0cwt 0.2cwt 0.4cwt 0.6cwt
## Golden.rain    6     6     6     6
## Marvellous    6     6     6     6
## victory       6     6     6     6
```

b)

```
tapply(rendement, engrais, function(x) sum(x > mean(x)))
```

```
## 0.0cwt 0.2cwt 0.4cwt 0.6cwt
##      8     9     9     8
```

```
tapply(rendement, variete, function(x) sum(x > mean(x)))
```

```
## Golden.rain Marvellous victory
##          10          12          11
```

```
tapply(rendement, list(engrais,variete), function(x) sum(x > mean(x)))
```

```
##          Golden.rain Marvellous victory
## 0.0cwt           2           4           2
## 0.2cwt           4           3           3
## 0.4cwt           3           4           3
## 0.6cwt           4           2           2
```

c)

```
tapply(rendement, engrais, function(x) sum(x > mean(rendement)))
```

```
## 0.0cwt 0.2cwt 0.4cwt 0.6cwt
##      3     6    12    14
```

```
tapply(rendement, variete, function(x) sum(x > mean(rendement)))
```

```
## Golden.rain Marvellous victory
##          11          15           9
```

```
tapply(rendement, list(engrais,variete), function(x) sum(x > mean(rendement)))
```

```
##          Golden.rain Marvellous victory
## 0.0cwt           1           1           1
## 0.2cwt           2           3           1
## 0.4cwt           3           6           3
## 0.6cwt           5           5           4
```

d)


```
tapply(rendement, list(engrais, variete), mean)
```

```
##           Golden.rain Marvellous  victory
## 0.0cwt      80.0000    86.66667  71.50000
## 0.2cwt      98.5000   108.50000  89.66667
## 0.4cwt     114.6667   117.16667 110.83333
## 0.6cwt     124.8333   126.83333 118.50000
```