MUSÉUM NATIONAL D'HISTOIRE NATURELLE

SEMIN-R

Mise en forme de la fenêtre "graphique" : agencements complexes de figures

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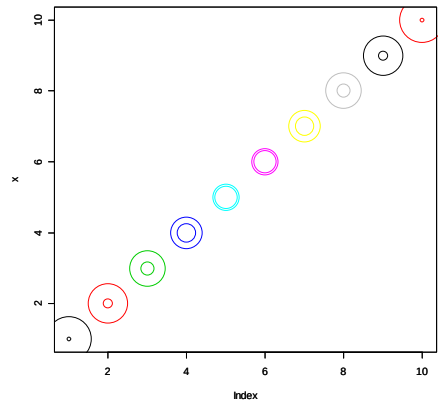
SUPERPOSITION DE GRAPHIQUES

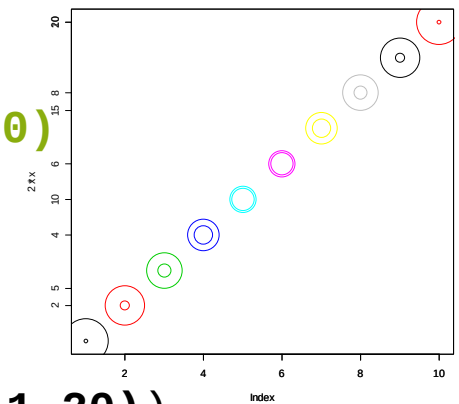
Pour superposer successivement des graphiques, il faut utiliser **par (new = TRUE)** entre chaque graphique.

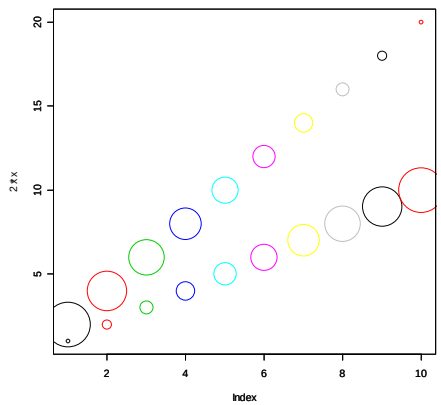
```
x<-1:10
plot(x,cex=x,col=x)
par(new=TRUE)
plot(x,cex=rev(x),col=x)
```



Attention aux échelles !! Il s'agit d'un superposition brute…

```
# 1≤x≤10, par défaut ylim=c(1,10)
plot(x,cex=x,col=x)
par(new=TRUE)
# 2≤2*x≤20, par défaut ylim=c(2,20)
plot(2*x,cex=rev(x),col=x)

plot(x,cex=x,col=x, ylim=c(1,20))
par(new=TRUE)
plot(2*x,cex=rev(x),col=x,ylim=c(1,20))
```



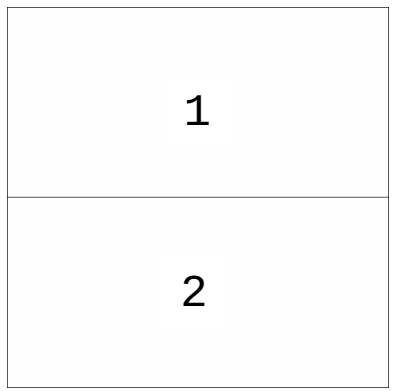


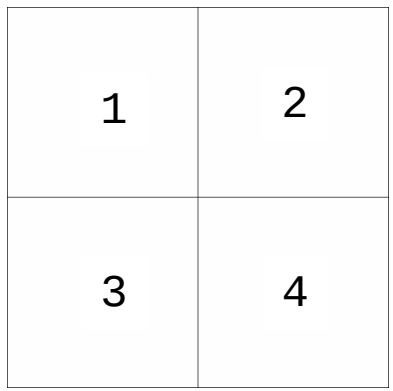
DIVISION DE LA FENETRE GRAPHIQUE (1)

La fenêtre peut être divisée en sous-ensembles de tailles égales avec les arguments **mcol** ou **mfrow** de **par()**

```
mfcol, mfrow
        A vector of the form c(nr, nc). Subsequent figures will be drawn in an
        nr-by-nc array on the device by columns (mfcol), or rows (mfrow),
        respectively. [...]
```

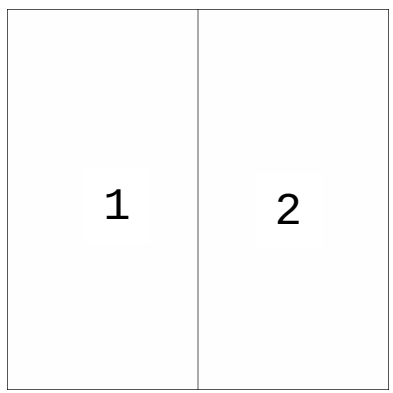
```
par(mfrow=c(2,1))
      # ou
par(mfcol=c(2,1))
```

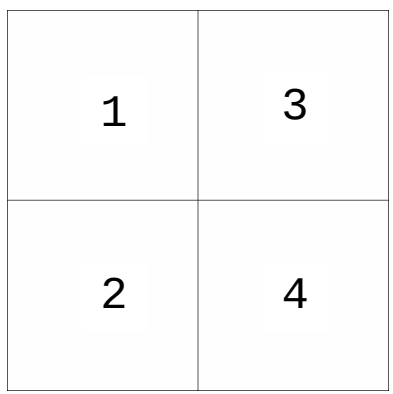





```
par(mfrow=c(2,2))
```

```
par(mfrow=c(1,2))
      # ou
par(mfcol=c(1,2))
```






```
par(mfcol=c(2,2))
```

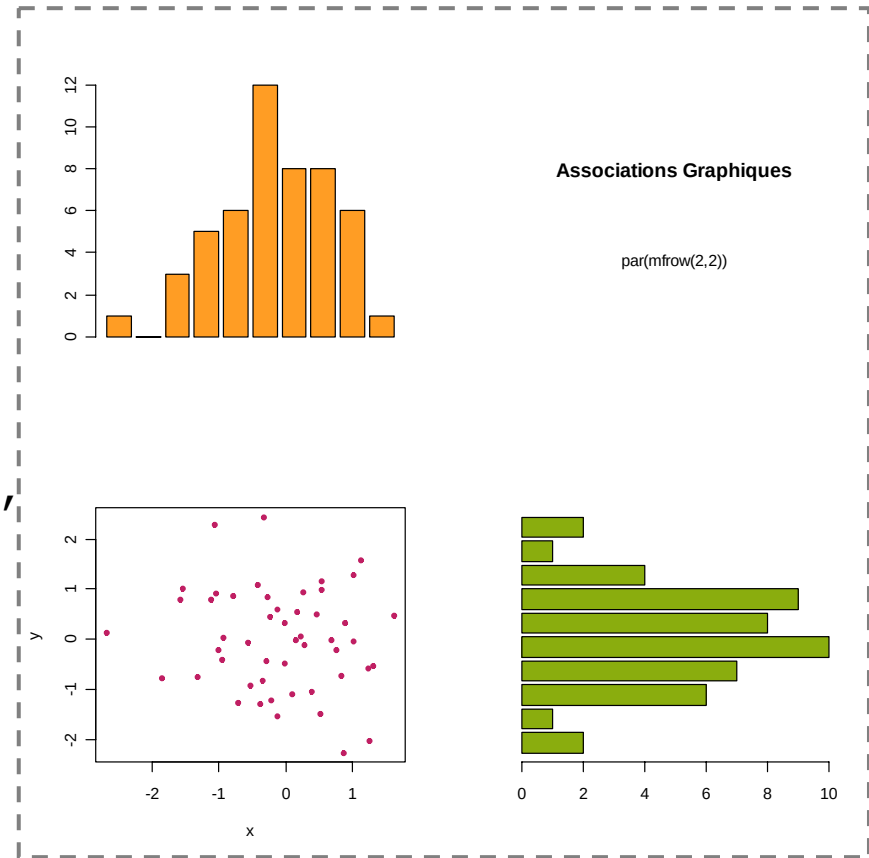
DIVISION DE LA FENETRE GRAPHIQUE (2)

```
x<-rnorm(50);y<-rnorm(50)
par(mfrow=c(2,2))

# case 1
barplot(hist(x,plot=F)$counts,
        col=rgb(255,157,36,max=255))

# case 2
plot.new()
title(main="Associations Graphiques",
        sub="par(mfrow(2,2))",
        line=-5)

# case 3
plot(x,y,pch=20,
        col=rgb(192,31,99,max=255))

# case 4
barplot(hist(y,plot=F)$counts,horiz=T,
        col=rgb(138,173,14,max=255))
```

voir les arguments **mar** et **oma** de **par()**
de type c(bottom, left, top, right)

```
# avec par(mfrow=c(2,2))
```

1	2
3	4



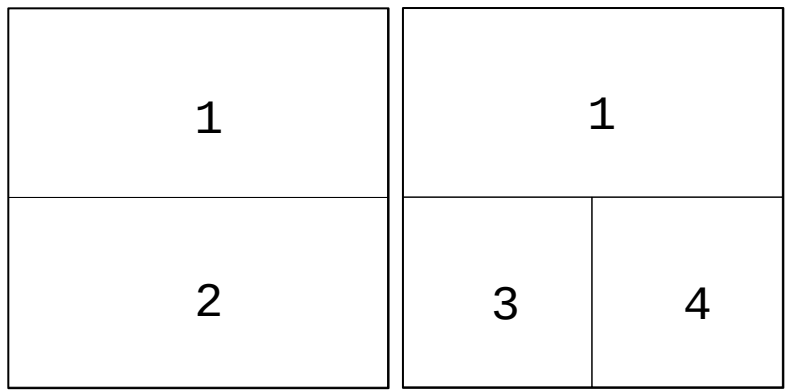
DIVISION DE LA FENETRE GRAPHIQUE (3)

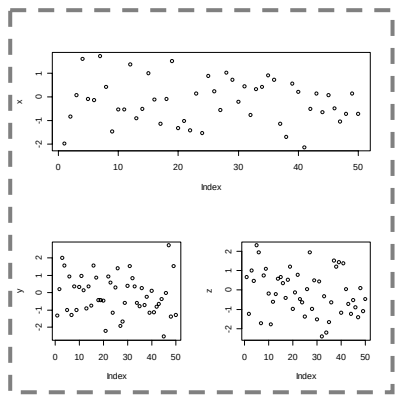
Vers une mise en page plus complexe…

```
split.screen() ; screen() ; erase.screen() ; close.screen()
```

These functions are totally incompatible with the other mechanisms for arranging plots on a device: `par(mfrow)`, `par(mfcol)` and `layout()`.

```
x<-rnorm(50);y<-rnorm(50);z<-rnorm(50)

# division de la fenêtre
       2 lignes & 1 colonne :
split.screen(c(2,1)) # [1] 1 2

# division de la sous-fenêtre
       1 ligne & 2 colonnes :
split.screen(c(1,2),2) # [1] 3 4


screen(1) ; plot(x)
screen(3) ; plot(y)
screen(4) ; plot(z)
```



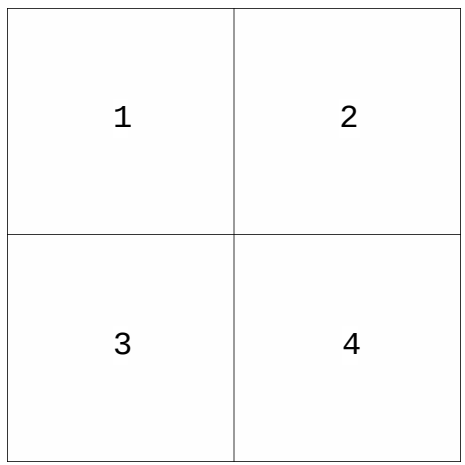


DIVISION DE LA FENETRE GRAPHIQUE (4)

Un pas supplémentaire vers la complexité, utilisation de la fonction **layout ()**

> `layout`
> divides the device up into as many rows and columns as there are in matrix mat, with the column-widths and the row-heights specified in the respective arguments. [...]

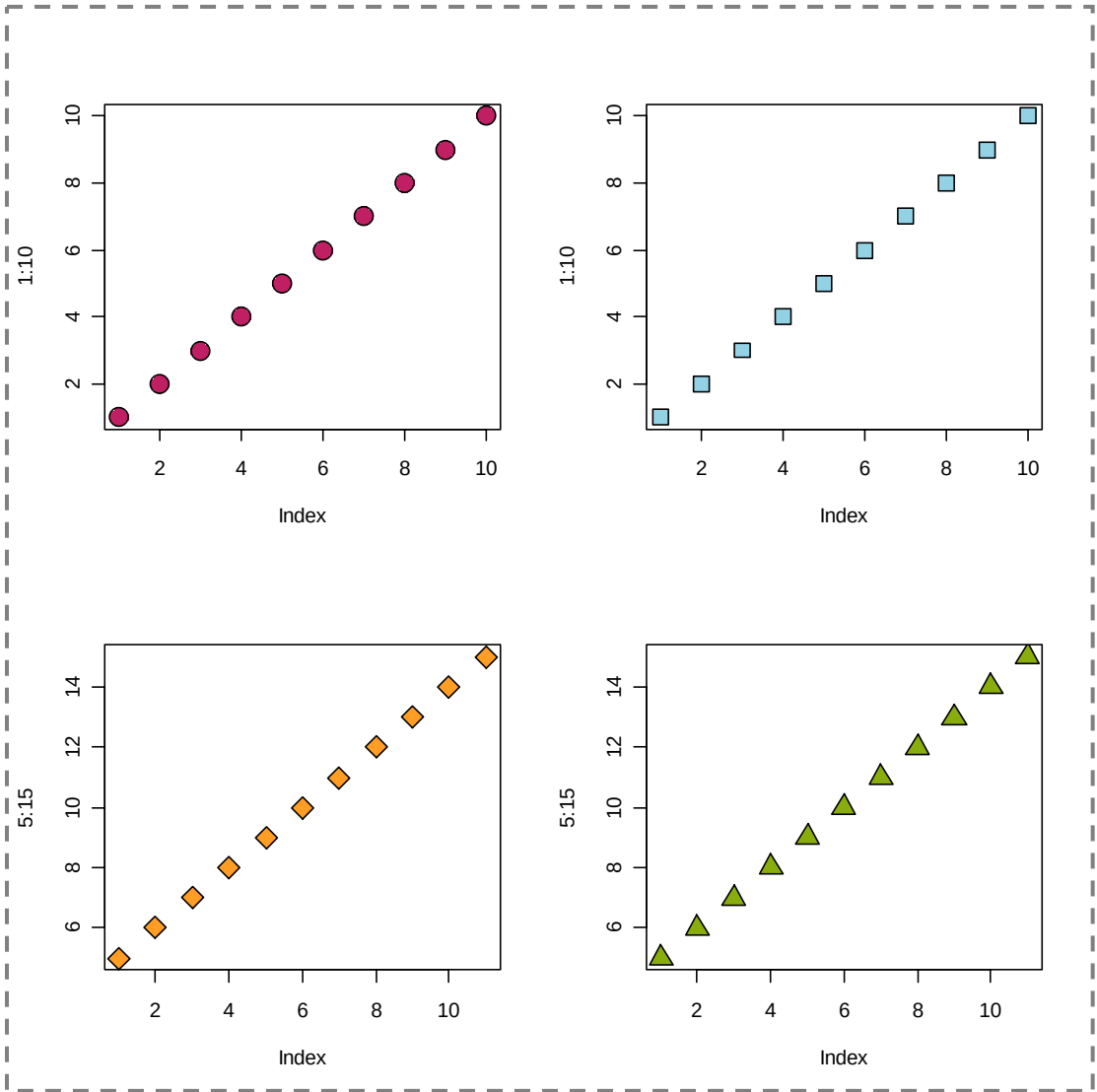
```
# cas simple équivalent à par(mfrow=c(2,2))
m<-matrix(1:4,nrow=2,ncol=2,byrow=TRUE)
m
#      [,1] [,2]
#[1,]    1    2
#[2,]    3    4

layout(m)
layout.show(4)
```



Conseil : pour les matrices plus complexes, prenez le temps de la dessiner

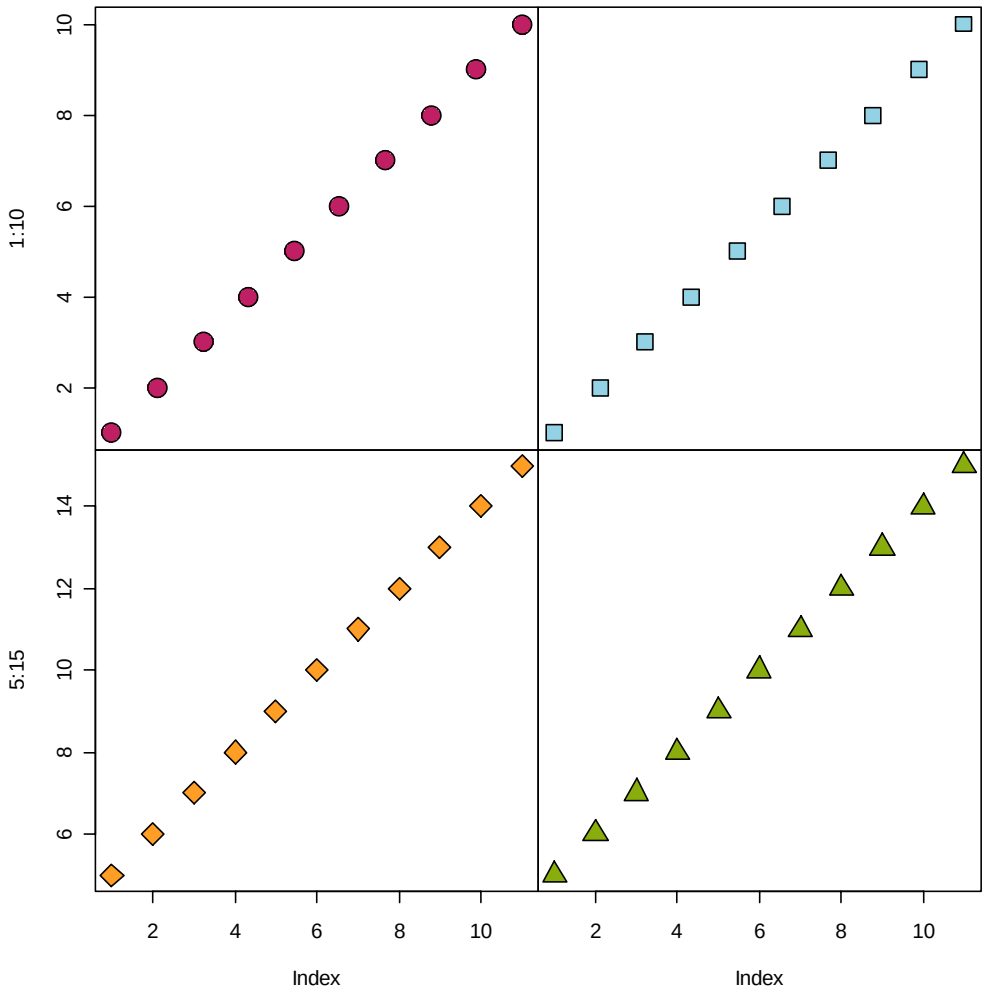
DIVISION DE LA FENETRE GRAPHIQUE (5)

```
# exemple 1 :
layout(matrix(1:4,nrow=2,ncol=2,byrow=TRUE))

# code couleur
O<-rgb(255,157,36,max=255)
R<-rgb(192,31,99,max=255)
V<-rgb(138,173,14,max=255)
C<-rgb(147,209,228,max=255)

# case 1
plot(1:10,pch=21,
       bg=R,cex=2)
# case 2
plot(1:10,pch=22,
       bg=C,cex=2)
# case 3
plot(5:15,pch=23,
       bg=O,cex=2)
# case 4
plot(5:15,pch=24,
       bg=V,cex=2)
```



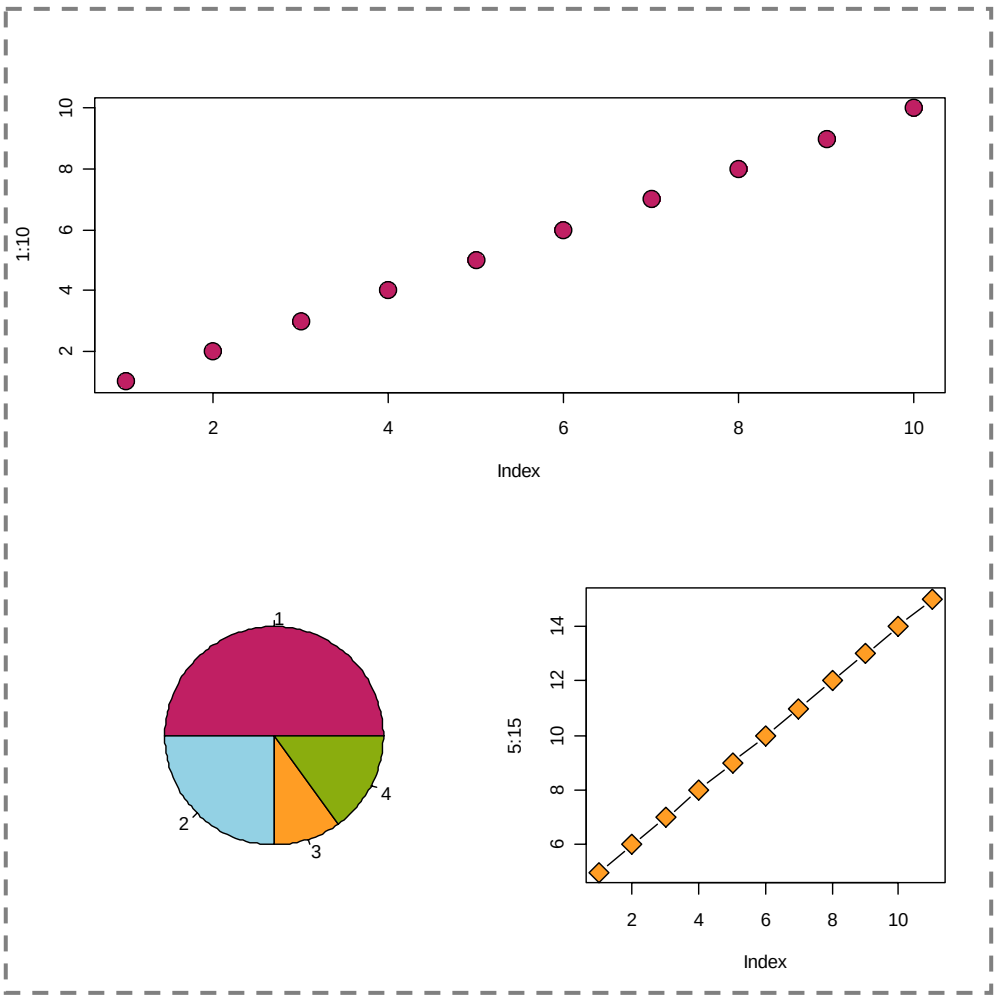
DIVISION DE LA FENETRE GRAPHIQUE (6)

```
# exemple 1bis :
layout(matrix(1:4,nrow=2,ncol=2,byrow=TRUE))
par(oma=c(1,1,0,0))
# case 1
par(mar=c(0,4,4,0))
plot(1:10,pch=21,
       bg=R,cex=2,
       xaxt="n",xlab="")
# case 2
par(mar=c(0,0,4,4))
plot(1:10,pch=22,
       bg=C,cex=2,
       xaxt="n",xlab="",
       yaxt="n",ylab="")
# case 3
par(mar=c(4,4,0,0))
plot(5:15,pch=23,
       bg=O,cex=2,)
# case 4
par(mar=c(4,0,0,4))
plot(5:15,pch=24,
       bg=V,cex=2,
       yaxt="n",ylab="")
```



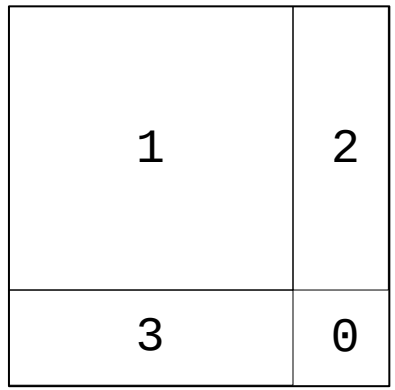
DIVISION DE LA FENETRE GRAPHIQUE (7)

```
# exemple 2 équivalent à l'exemple split.screen()

m<-matrix(c(1,1,2,3),2,2,byrow=TRUE)
m
#      [,1] [,2]
#[1,]    1    1
#[2,]    2    3


layout(m)
layout.show(3)


# case 1
plot(1:10,pch=21,bg=R,cex=2)


# case 2
pie(c(0.5,0.25,0.1,0.15),
       col=c(R,C,O,V))


# case 3
plot(5:15,pch=23,
       bg=O,cex=2,type="b")
```

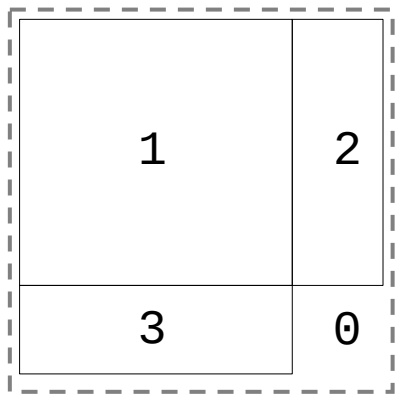


DIVISION DE LA FENETRE GRAPHIQUE (8)

```
# exemple 3 :

layout(matrix(c(1,2,3,0),2,2,byrow=TRUE),
       widths=c(3,1),heights=c(3,1))
layout.show(3)
```

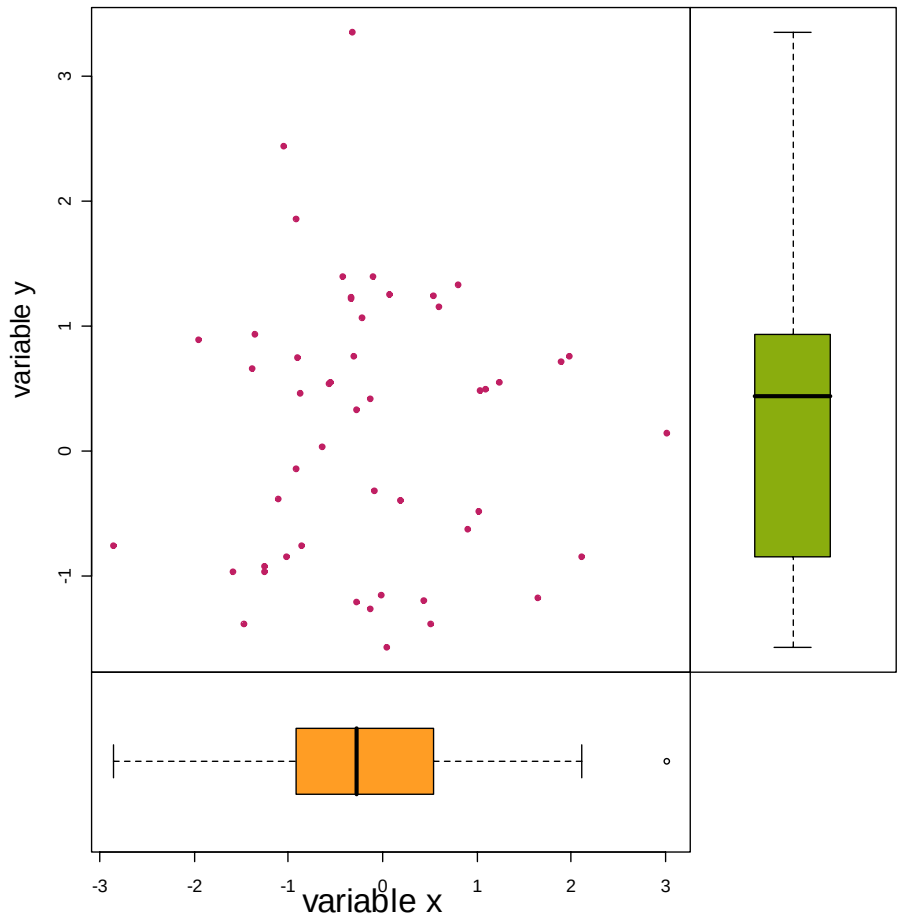



```
# exemple 3 bis :

layout(matrix(c(1,2,3,0),2,2,byrow=TRUE),
       widths=c(3,1),heights=c(3,1))

# création d'une marge extérieure :
par(oma=c(2,1,1,1))
layout.show(3)
```



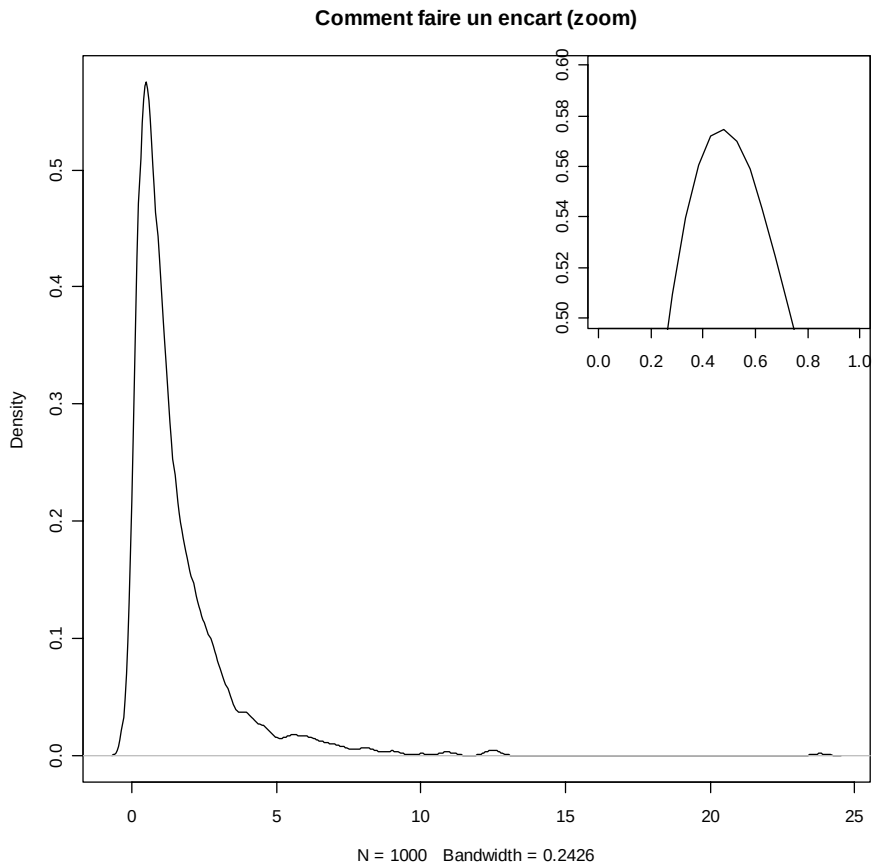
DIVISION DE LA FENETRE GRAPHIQUE (9)

```
# exemple 4 :

layout(matrix(c(1,2,3,0),2,2,byrow=TRUE),
       widths=c(3,1),heights=c(3,1))
par(oma=c(2,1,1,1))
layout.show(3)

x<-rnorm(50);y<-rnorm(50)

# case 1
par(mar=c(0,4,0,0))
plot(x,y,pch=20,col=R,
       xaxt="n",xlab="",
       ylab="variable y",
       cex.lab=1.5)

# case 2
par(mar=c(0,0,0,1))
boxplot(y,col=V,yaxt="n",ylab="")

# case 3
par(mar=c(2,4,0,0))
boxplot(x,horizontal=TRUE,col=O)

# ajout de la légende axe des X
mtext("variable x",side=1,outer=TRUE,at=0.4,cex=1.5)
```



DIVISION DE LA FENETRE GRAPHIQUE (10)

```
# exemple 5 : ZOOM
m<-matrix(c(1,2,1,1),ncol=2,byrow=T)
m
# [,1] [,2]
# [1,]    1    2
# [2,]    1    1

layout(m,widths=c(1.25,1))
layout.show(2)
```

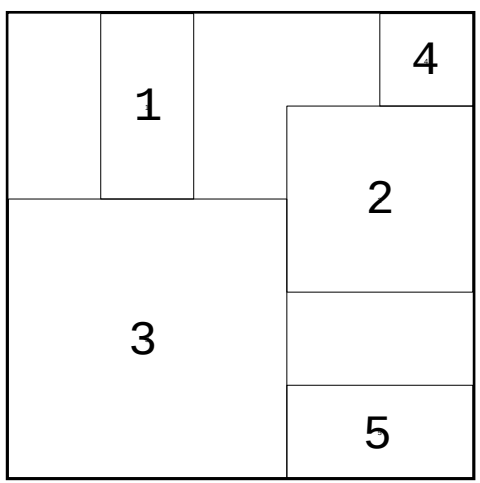


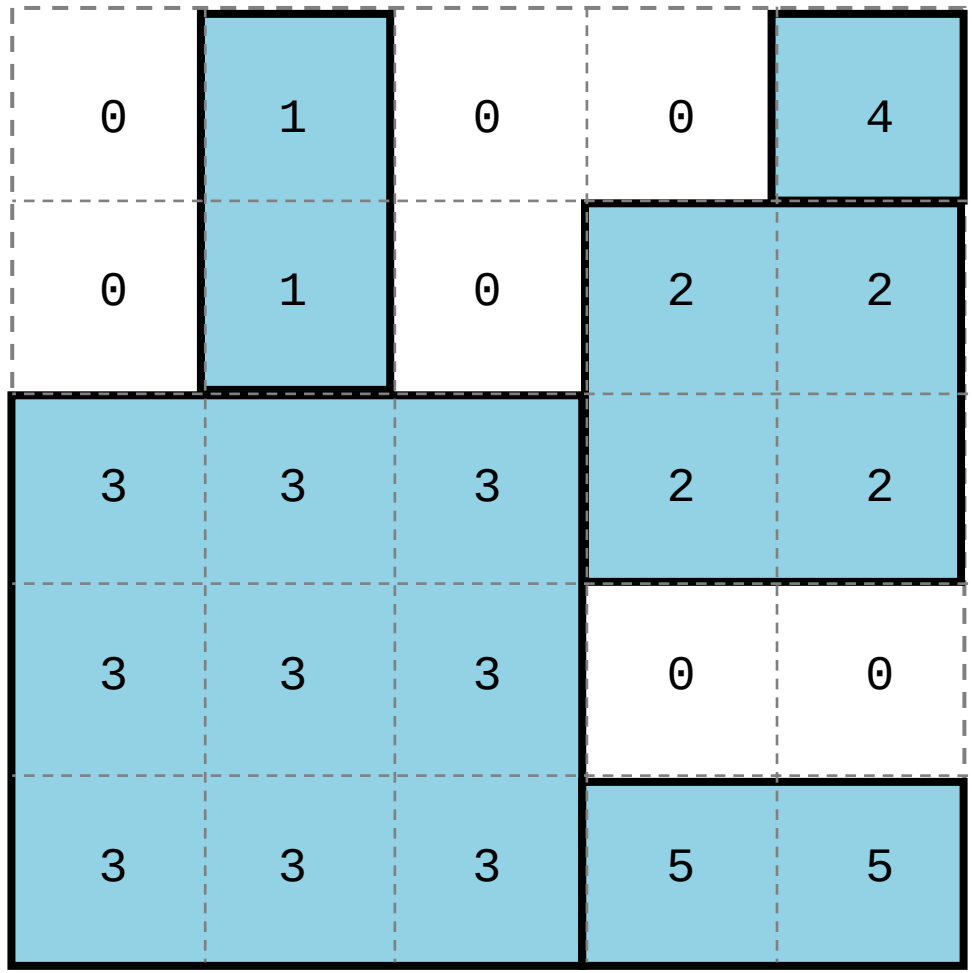

```
x<-rlnorm(1000)
# distribution lognormale
-> distribution asymétrique
```

```
plot(density(x),main="Comment faire un encart (zoom)")

plot(density(x),xlim=c(0,1),ylim=c(0.5,0.6),xlab="",ylab="",main="")
```

DIVISION DE LA FENETRE GRAPHIQUE (11)

```
# exemple 6 : …

m<-matrix(c(0,0,3,3,3,1,1,3,3,3,0,0,3,3,3,0,2,2,0,5,4,2,2,0,5),
        ncol=5,nrow=5,byrow=FALSE)
m
#      [,1] [,2] [,3] [,4] [,5]
#[1,]    0    1    0    0    4
#[2,]    0    1    0    2    2
#[3,]    3    3    3    2    2
#[4,]    3    3    3    0    0
#[5,]    3    3    3    5    5

layout(m); layout.show(5)
```





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```
# Liens utiles :
```

http://cran.r-project.org/doc/contrib/Paradis-rdebuts_fr.pdf

"R pour les Débutants" by Emmanuel Paradis,
the french version of "R for Beginners"
⇨ chap. 4 Les graphiques avec R (p.38-58)

http://addictedtor.free.fr/graphiques

R Graph Gallery by François Romain