```
# Correction TP1

# Exercice 1
x  <- c(2,6,5,8,1,3,9)
x1 <- c(10,11,12)
c(x,x1)


# Exercice 2
A <- matrix(1:9,ncol=3)
B<- rbind(A,c(1,1,1))
dim(B)

# Exercice 3
A <- c(1,4,5)
Mat <- matrix(1,nrow=3,ncol=4)
l1<- list(vecteur=A,matrice=Mat)
# ou
l1<- list(A,Mat)
names(l1)<- c("vecteur","matrice")
    csv
# Exercice 4
Cat <- read.table(file="./cathedral.csv",
header=TRUE,row.names=1,sep=",")


# Exercice 5
Intima <- read.table("./Intima_Media.csv",sep=',',header=TRUE)
head(Intima)
attach(Intima)
IMC<- poids/(taille^2)*100^2
Intima<-cbind(Intima,IMC)
head(Intima)
mes30<-mesure[IMC>30]
femsport<-Intima[SPORT==1 & SEXE==2,c(-1,-7)]
head(femsport)
nonob<-Intima[AGE>=50 & IMC<=30,]
head(nonob)

# Exercice 6
A<- matrix (1:9,ncol=3)
sum(A); sum(A[,1]); max(A[2,])

# Exercice 7
#choose(n,k) : coefficient binomial
x<- choose(6,0:6)
sum(x);max(x);which.max(x); sort(x)

# Exercice 8
exo8 <- function(x,y,N){
        z<-x+y
        nomb<-sum(N>=x & N<=y)
        matpair<-
matrix(c(rep(0,length=nrow(N)),rep(0:1,length=nrow(N))),ncol=ncol(N)
```

```
,nrow=nrow(N))
        Ntilde<-x*matpair +y*(1-matpair)
        sortie <-list(z,nomb,Ntilde)
        return(sortie)
}

# Exercice 9
ma.variance<- function(x){
        sortie<- sum((x-mean(x))^2)/(length(x)-1)
        return(sortie)
}

# C'est la même chose que var

# Exercice 10
compte <- function(sequence,lettre){
        sortie<-sum(sequence==lettre)
        return(sortie)
}
sequence<- c('a','a','t','g','a','g','c','t','a','g','c','t','g')
compte(sequence,'a')

res<-c()
for (lettre in c('a','c','g','t')) {
        res<-c(res,compte(sequence,lettre))
}
res

# Exercice 11
x1<- -5; x2 <- 6; y1<- 0; y2<-0.5
plot(dnorm, xlim=c(x1,x2),ylim=c(y1,y2),xlab='',ylab='',col='green')
x<- seq(x1,x2,by=0.1)
lines(x,dnorm(x,mean=2,sd=sqrt(0.8),col='red')
legend('topleft',c('N(0,1)','N(2,0.8)'),col=c('green','red'),lty=c(1
,1),cex=0.5)
title('comparaison de densités Gaussiennes',cex.main=0.7)

# Exercice 12
par(mfrow=c(1,2))
x<- seq(-5,6,by=0.1)
plot(x,dnorm(x),ylim=c(0,0.5),main ='N(0,1)',type='l')
plot(x,dnorm(x,mean=2,sd=sqrt(0.8)),ylim=c(0,0.5),main='N(2,0.8)',ty
pe='l')

# Exercice 13
x<-Cat$haut;y<-Cat$long
plot(x,y,xlab='hauteur',ylab='longueur')

s<-Cat$style
plot(x[s=='goth'],
y[s=='goth'],col='green',xlab='hauteur',ylab='longueur',main='église
s romanes et gothiques')
points(x[s=='rom'],y[s=='rom'],col='red')
legend('bottomright',c('gothique','roman'),
```

```
col=c('green','red'),pch=1)


villes.tab=read.table(file="villes.csv",header=FALSE,sep="\t")
villes <- villes.tab[,1]
Temp.tab=read.table(file="temperatures.csv",header=TRUE,sep=",")
row.names(Temp.tab) <- villes
transTemp <- t(Temp.tab)
matplot(transTemp,type = 'l',main ="Comparaison des températures
moyennes \n mensuelles de 15 villes de France",ylab="Température
moyenne",xlab="Mois")
```