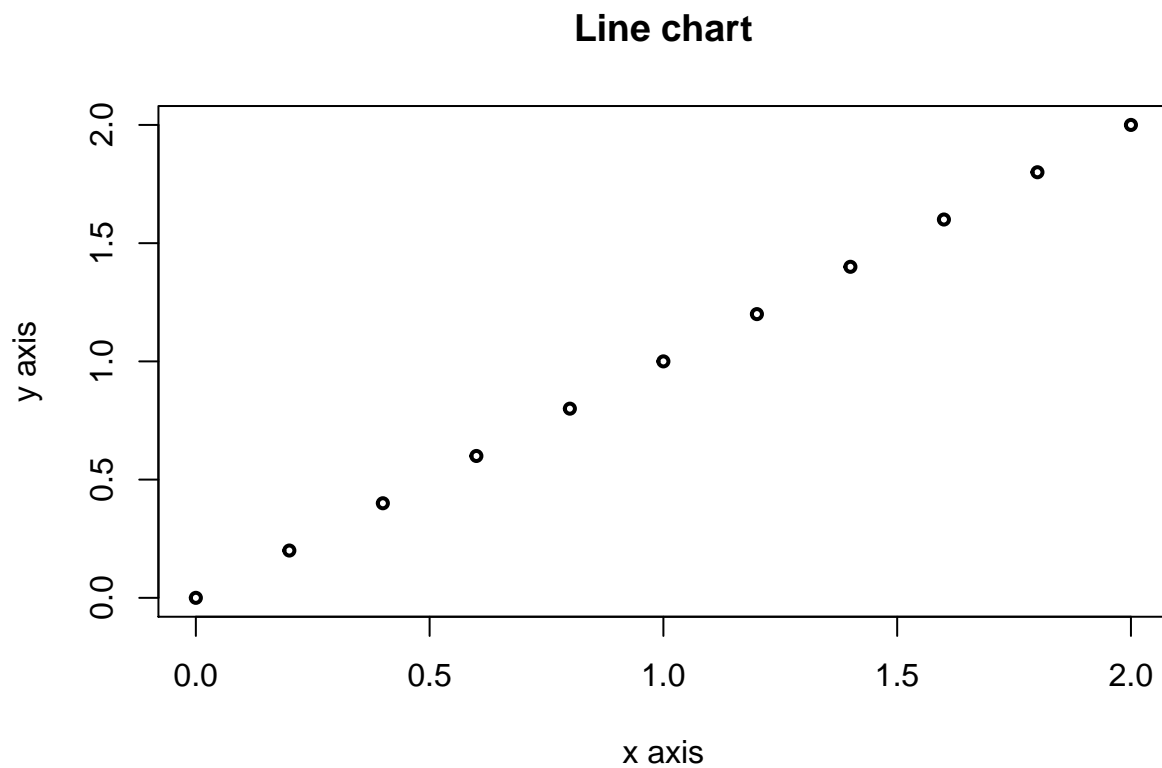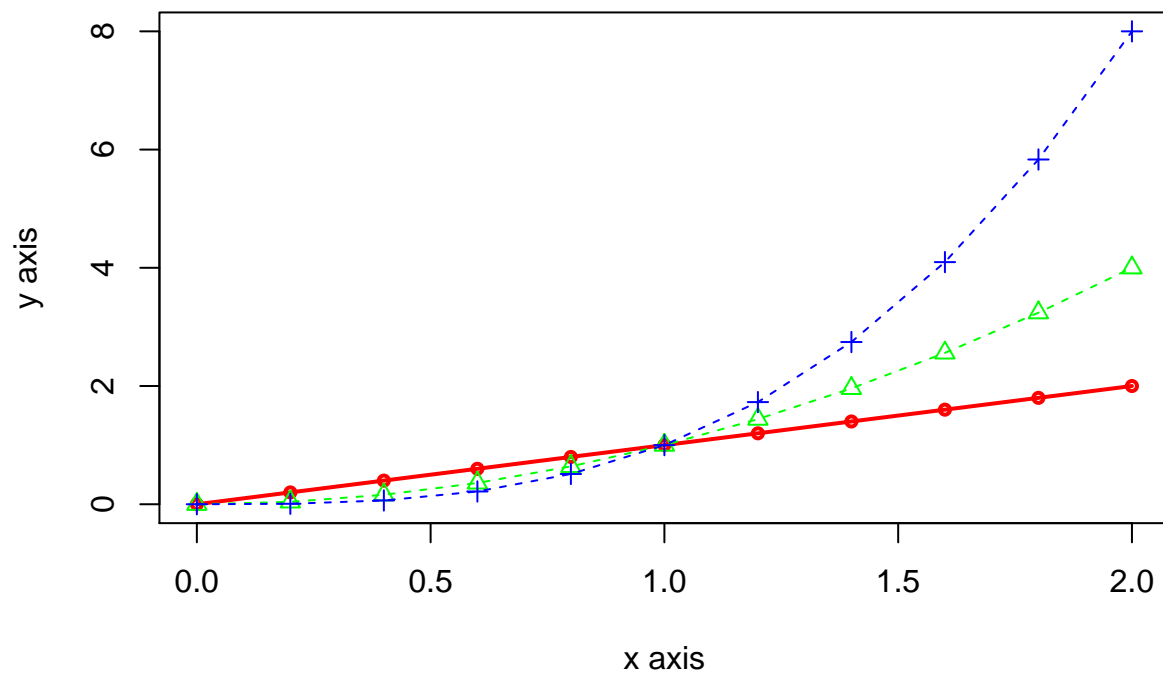# 5 Basics of graph

```
# Reference book: "Beginning R: The Statistical Programming Language"
# Author: Dr. Mark Gardener
```

Line chart

```
#help("plot")
x=seq(0,2,by=0.2)
y=x
y2=y^2
y3=y^3
plot(x,y,"p",pch=1,lty=1,xlab="x axis",ylab = "y axis",main="Line chart",cex=0.7,lwd=2)
```



```
plot(x,y,"o",pch=1,lty=1,xlab="x axis",ylab = "y axis",ylim = range(0,max(y3)),cex=0.7,lwd=2,col="Red")
lines(x,y2,"o",pch=2,lty=2,col="Green")
lines(x,y3,"o",pch=3,lty=2,col="Blue")
```
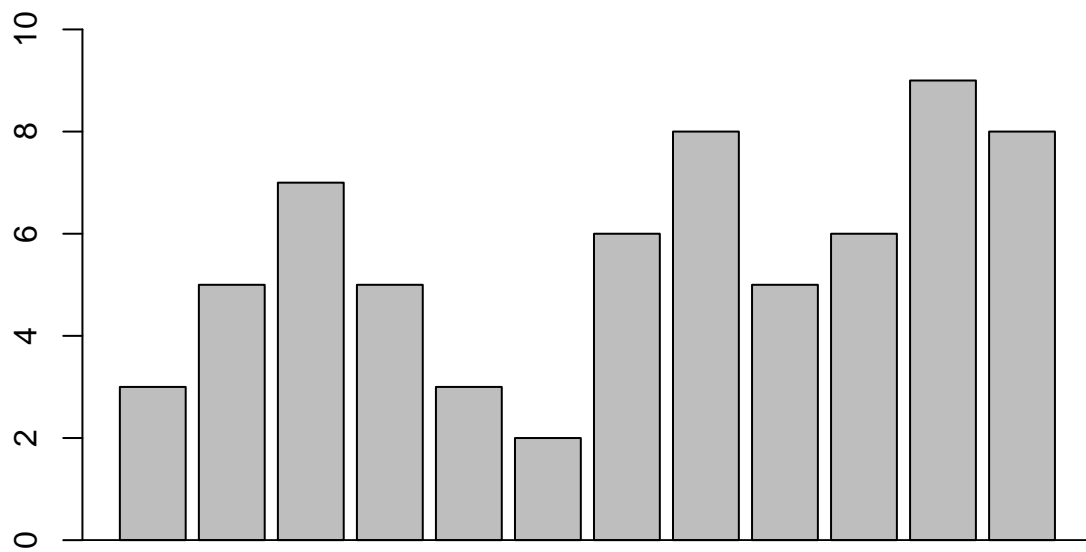
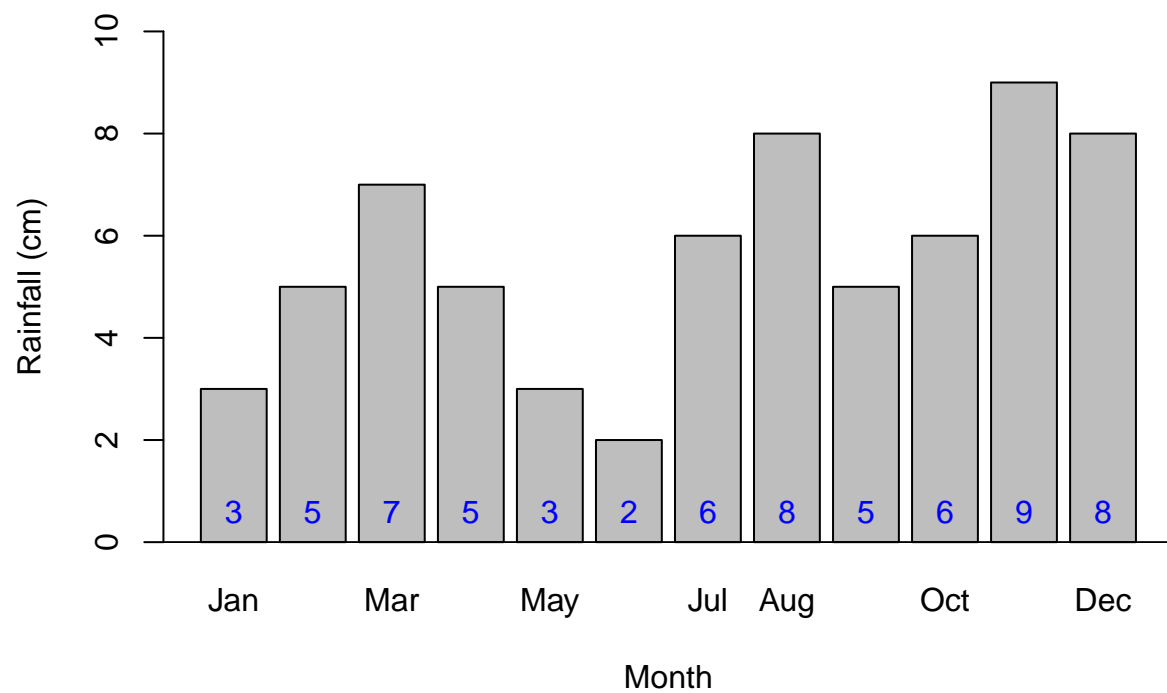**Bar chart for Vector or single category**

```
#help("barplot")
rain=c(3, 5, 7, 5, 3, 2, 6, 8, 5, 6, 9, 8)
table(rain)
```
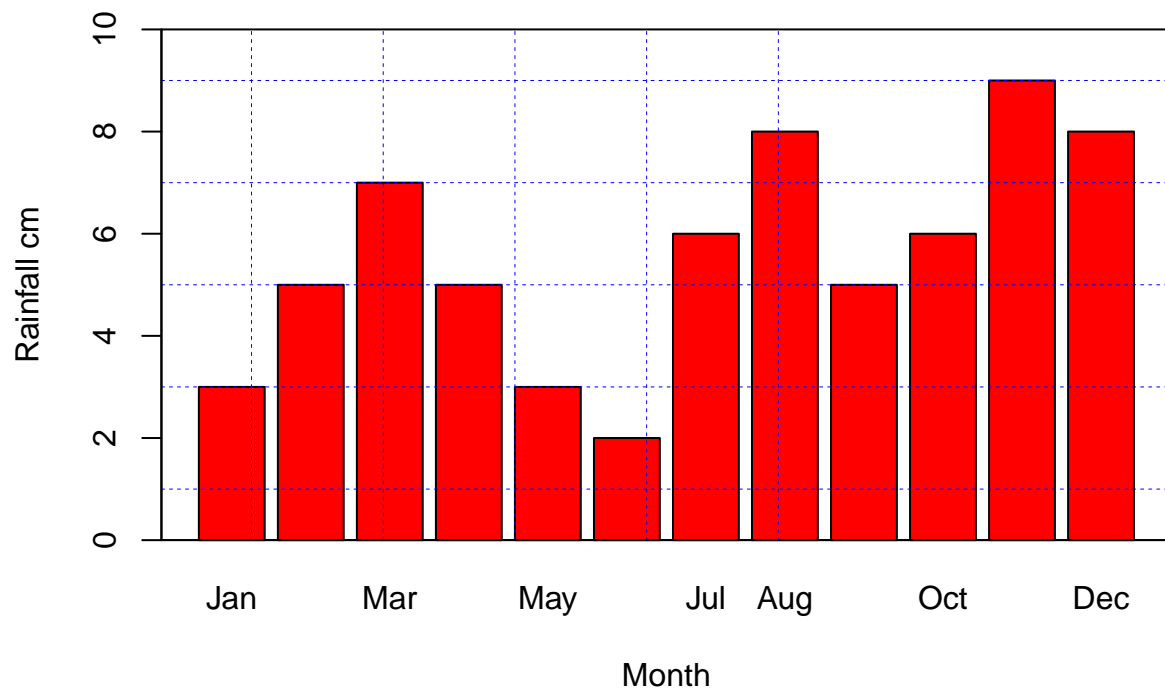
```
rain
2 3 5 6 7 8 9
1 2 3 2 1 2 1
```

```
barplot(rain, ylim = c(0,10))
abline(h=0)
```

```r
brplt=barplot(rain,names=month.abb,xlab='Month',ylab = 'Rainfall (cm)',ylim = c(0,10))
text(brplt,y=0,rain,pos=3,col = "blue")
abline(h=0)
```

```
barplot(rain,names=month.abb,col="Red",xlab='Month',ylab = 'Rainfall cm',ylim = c(0,10))
abline(h=0)
abline(h=seq(1,9,2),lty=2,lwd=0.5,col='blue')
abline(v=seq(1,9,2),lty=2,lwd=0.5,col='blue')
box()
```
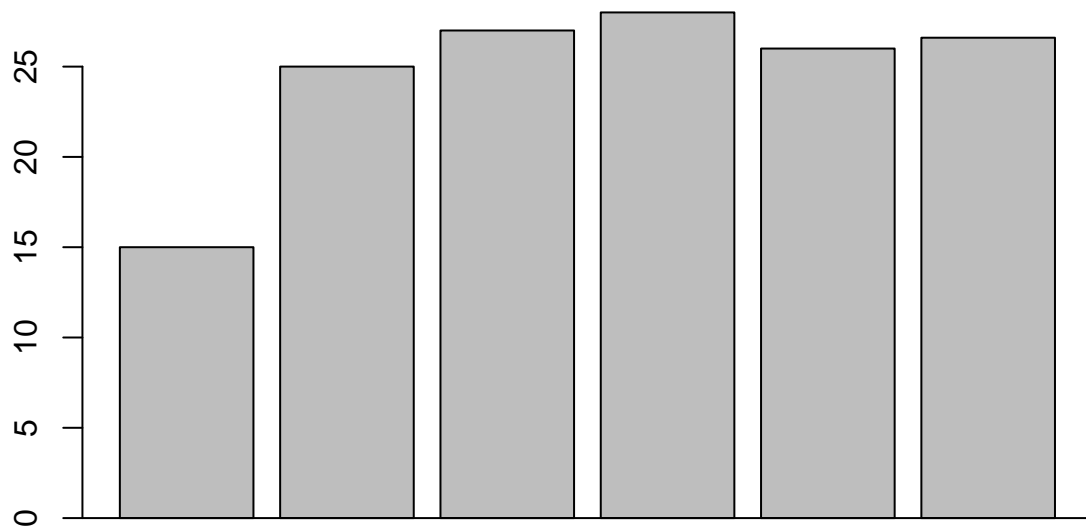
Bar chart for data frame

```
year=c(1995:2000)
sales=c(15, 25, 27, 28, 26, 26.6)
an.sales=data.frame(year,sales)
an.sales
```

```
  year sales
1 1995  15.0
2 1996  25.0
3 1997  27.0
4 1998  28.0
5 1999  26.0
6 2000  26.6
```

```
barplot(an.sales$sales)
abline(h=0)
```

```
brplt1 =barplot(an.sales$sales,xlab = "Year",ylab="Sales",main = "Bar plot",
                col="blue", ylim = c(0,30), names = c("1995","1996","1997","1998","1999","2000"))
text(brplt1,an.sales$sales,an.sales$sales,pos=3)
abline(h=0)
```
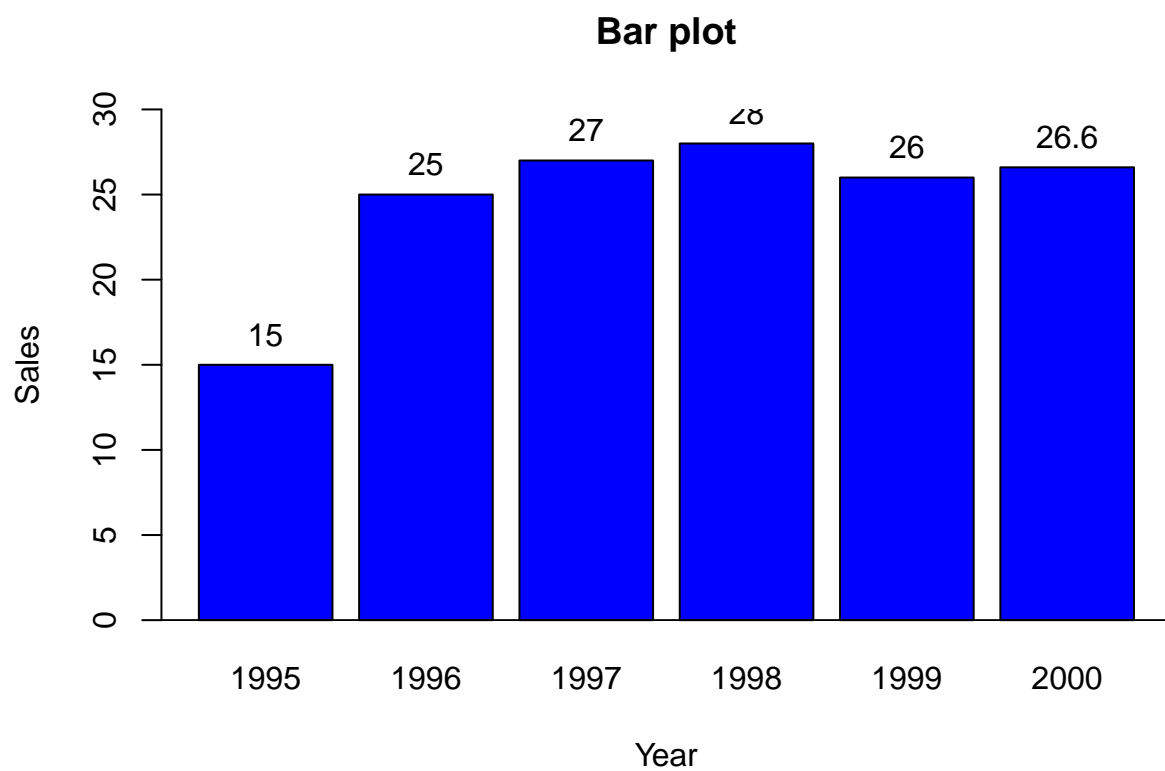
Bar plot


```
brplt2=barplot(an.sales$sales,horiz=T,names=c("1995","1996","1997","1998","1999","2000"),
               xlab = "Sales",ylab="Year",main = "Bar plot",col="green",las=1,xlim = c(0,30))
text(an.sales$sales,brplt2,sales,pos=4,col = "red")
abline(v=0)
```
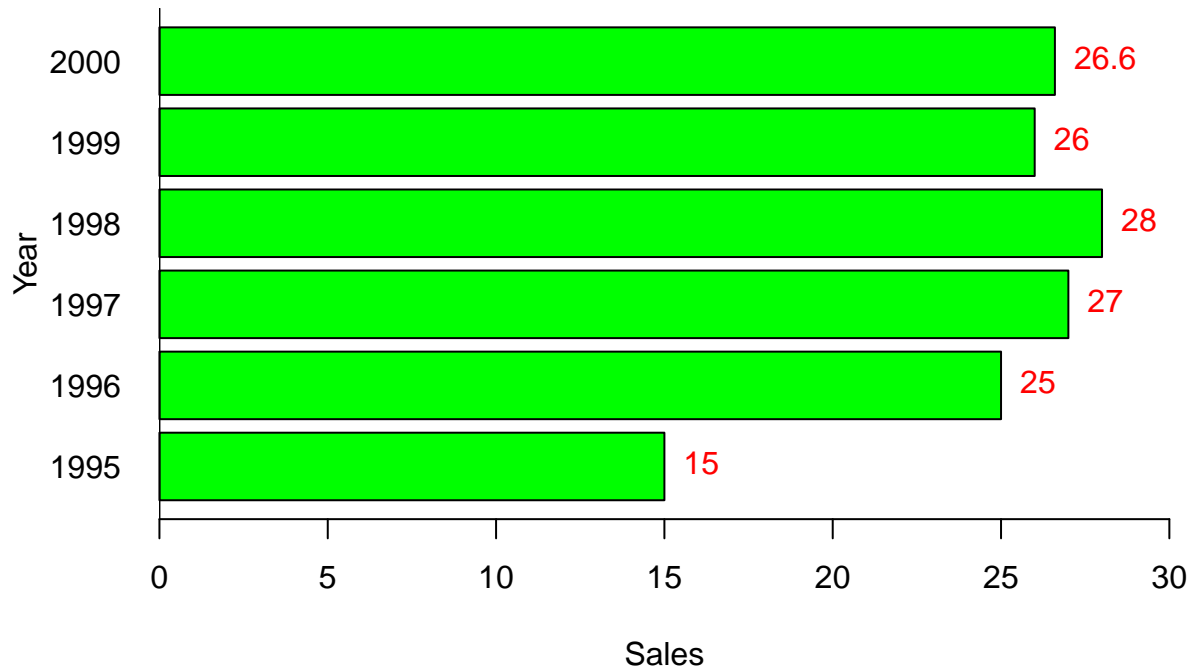
Bar plot

Bar chart for data frame fw
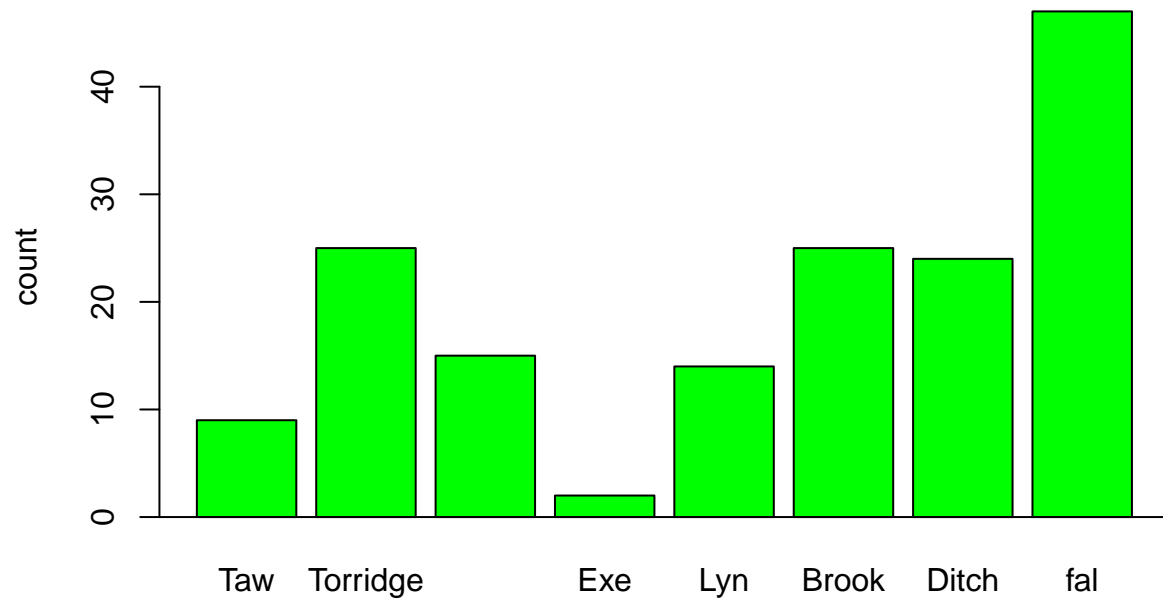
```
count =c(9, 25, 15, 2, 14, 25, 24, 47)
speed=c(2, 3, 5, 9, 14, 24, 29, 34)
fw=data.frame(count, speed)
rownames(fw)=c("Taw","Torridge","Ouse","Exe","Lyn","Brook","Ditch","fal")
fw
```

```
         count speed
Taw          9     2
Torridge    25     3
Ouse        15     5
Exe          2     9
Lyn         14    14
Brook       25    24
Ditch       24    29
fal         47    34
```
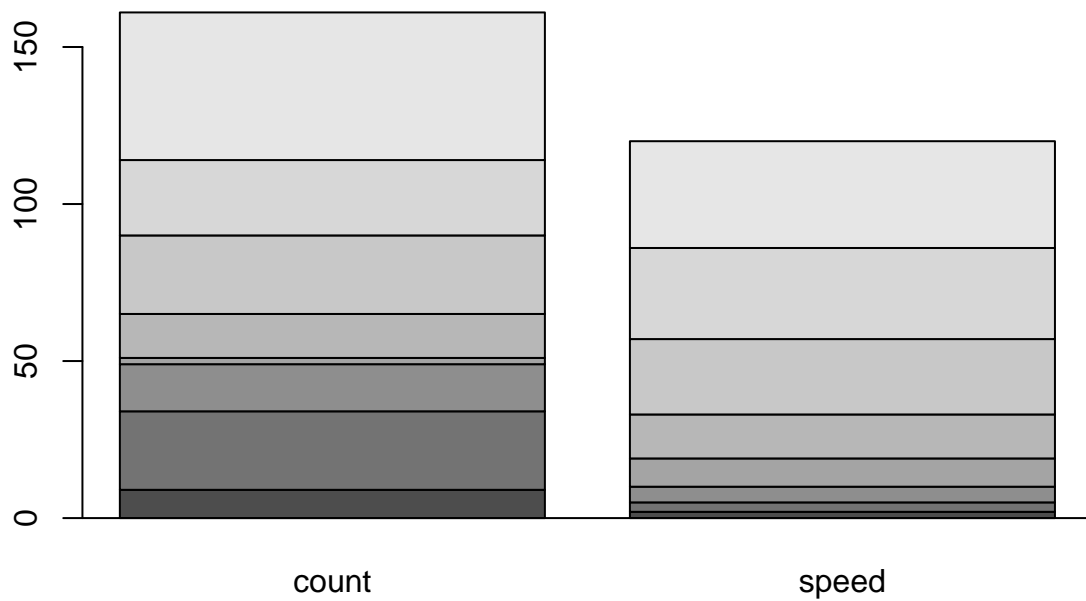
```r
barplot(fw$count,names=rownames(fw),ylab = "count",col="green")
abline(h=0)
```
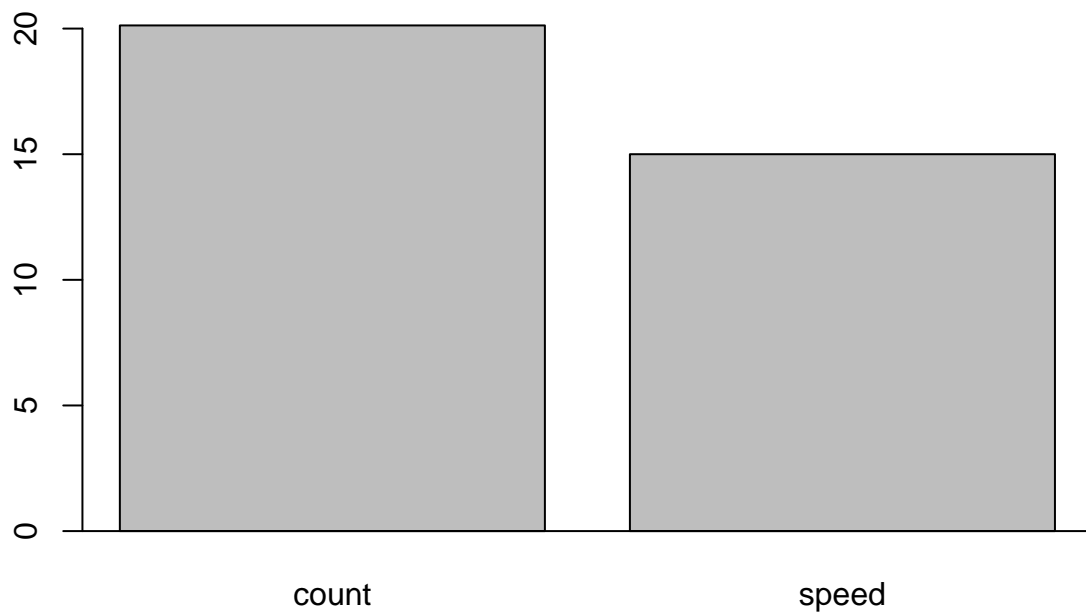


```r
barplot(as.matrix(fw)) # convert into matrix
abline(h=0)
```

```
clmn=colMeans(fw)
clmn
```
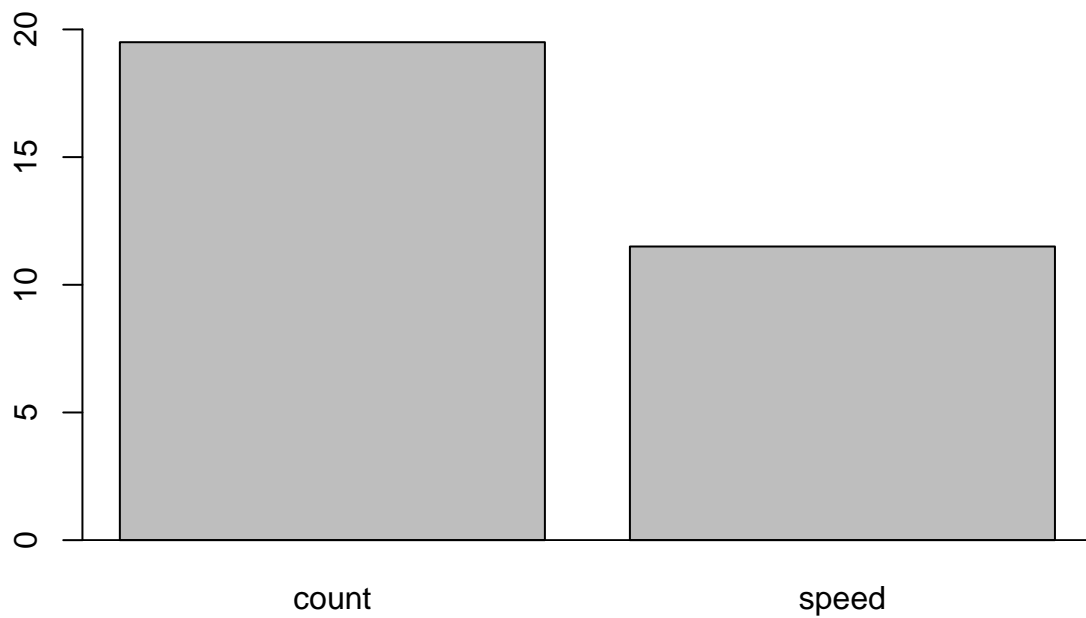
```
 count  speed
20.125 15.000
```

```
barplot(colMeans(fw))
abline(h=0)
```

```
clmdn=apply(fw, 2, median)
clmdn
```

```
count speed
 19.5  11.5
```

```
barplot(apply(fw,2,median),ylim=c(0,20))
abline(h=0)
```

Bar plot for matrix

```
rownm=c("Blackbird", "Chaffinch", "Great Tit", "House Sparrow", "Robin", "Song Thrush")
colnm=c("Garden","Hedgerow","Parkland","Pasture","Woodland")
bird=matrix(c(47,10,40,2,2,19,3,5,0,2,50,0,10,7,0,46,16,8,4,0,9,3,0,0,2,4,0,6,0,0),nrow=6,ncol=5,byrow=
bird
```

```
              Garden Hedgerow Parkland Pasture Woodland
Blackbird         47       10       40       2        2
Chaffinch         19        3        5       0        2
Great Tit         50        0       10       7        0
House Sparrow     46       16        8       4        0
Robin              9        3        0       0        2
Song Thrush        4        0        6       0        0
```
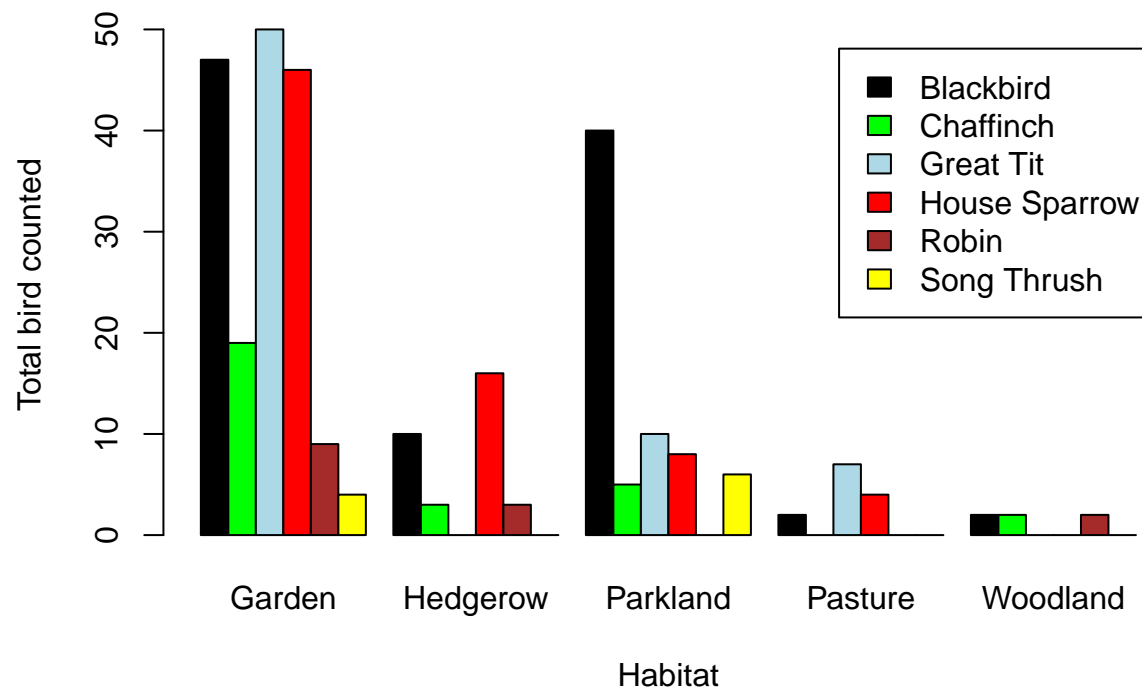
```
barplot(bird,ylim=c(0,200)) #when in matrix several rows, stacked chart
abline(h=0)
```
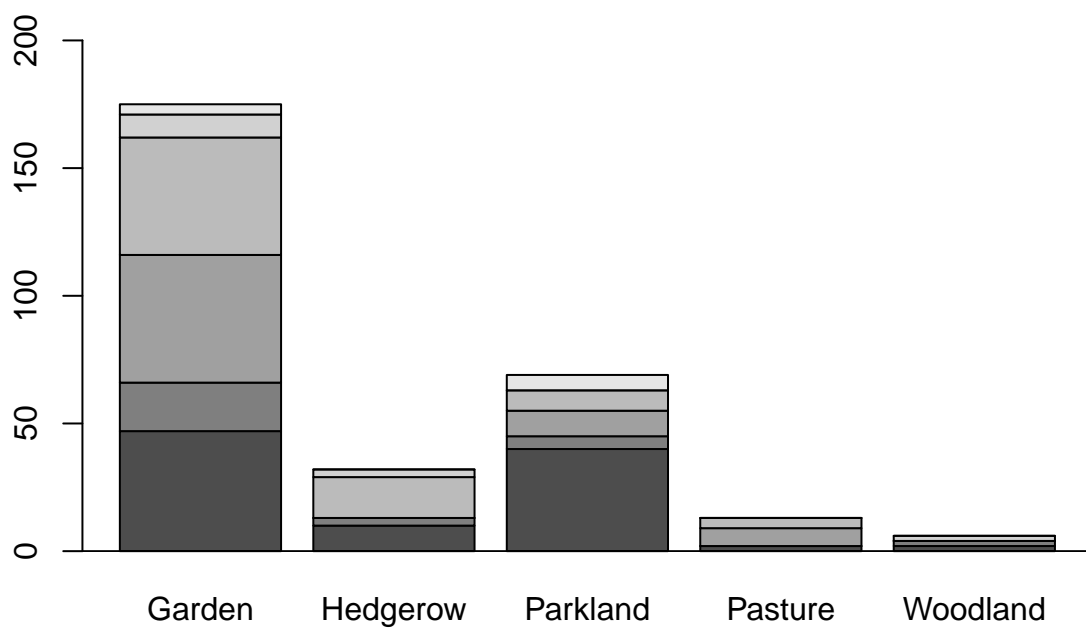
```r
barplot(bird,beside = T,ylab = "Total bird counted",xlab="Habitat")
abline(h=0)
```
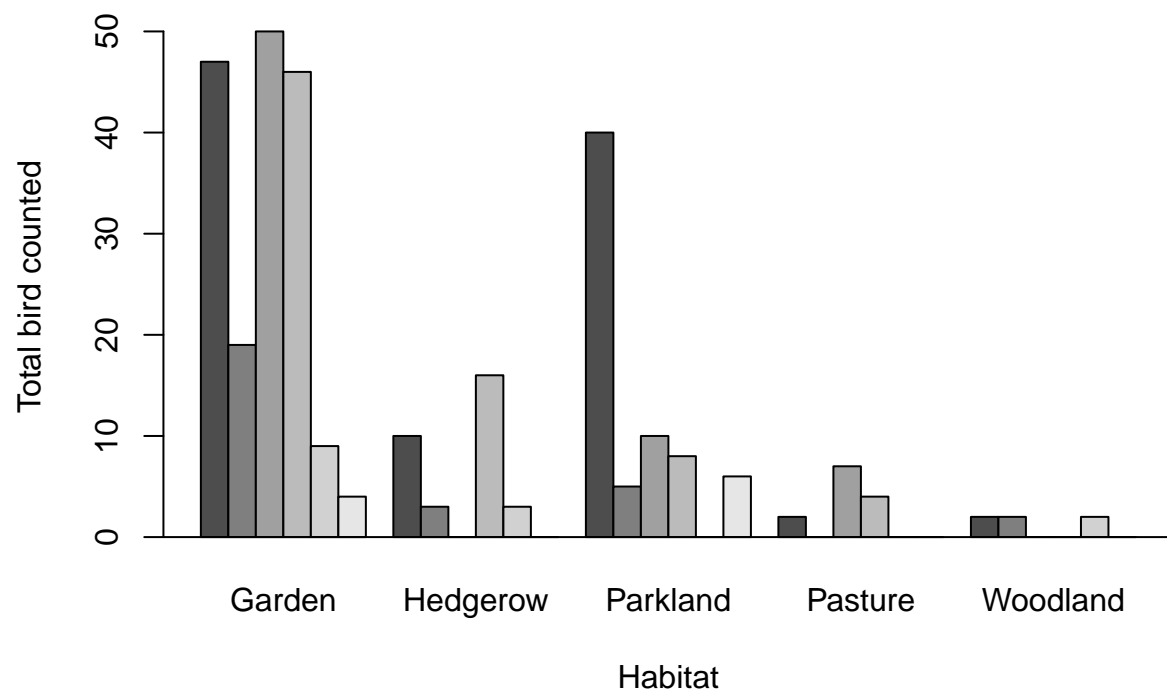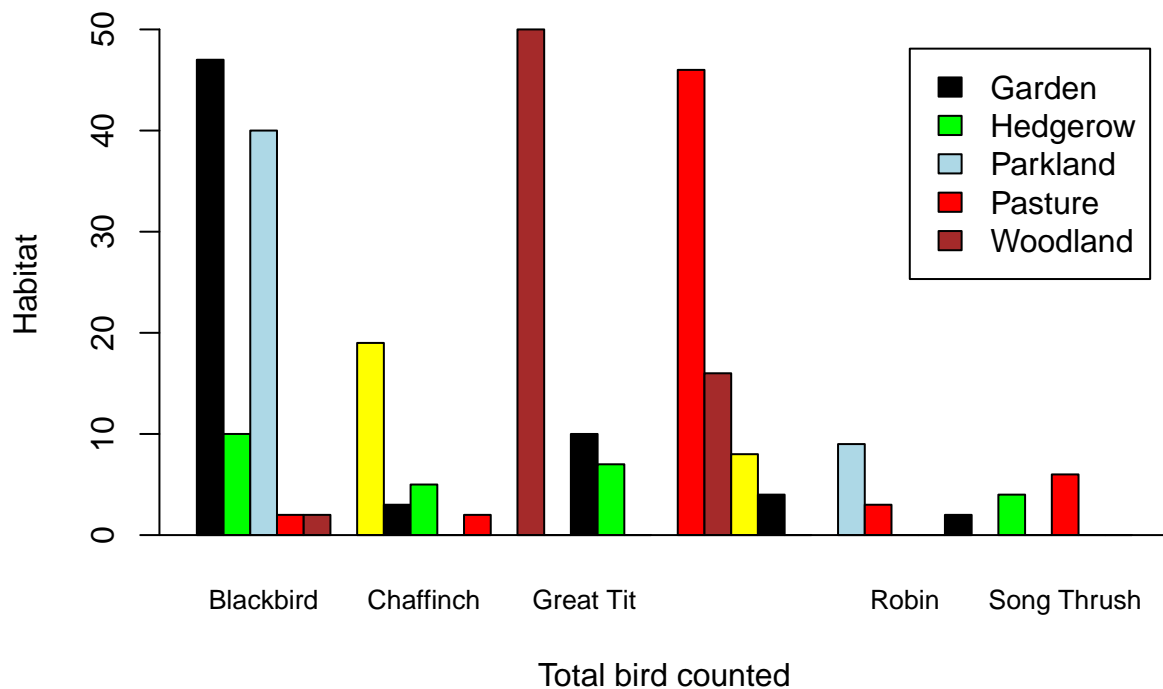
```r
barplot(bird,beside = T,legend=T,col=c("black","green","lightblue","red","brown","yellow"))
title(ylab = "Total bird counted",xlab="Habitat")
```

```
barplot(t(bird),beside = T,legend=T,cex.names=0.8,col=c("black","green","lightblue","red","brown","yell
title(xlab = "Total bird counted",ylab="Habitat")
abline(h=0)
```

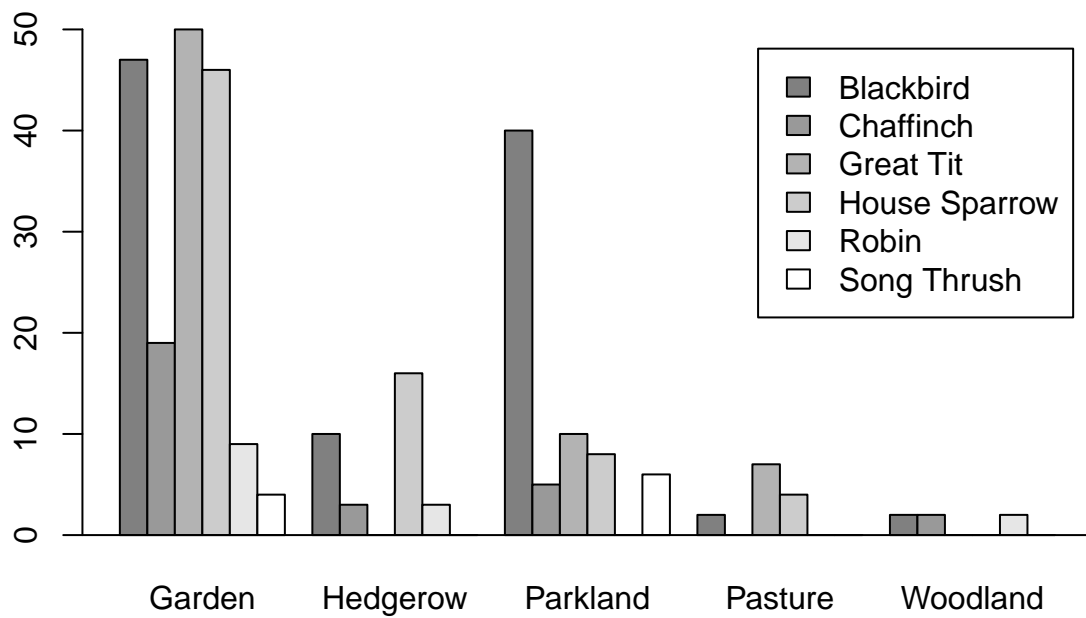**Use of palette() and legend() command**

```
palette()
```

```
[1] "black"    "#DF536B" "#61D04F" "#2297E6" "#28E2E5" "#CD0BBC" "#F5C710"
[8] "gray62"
```

```
palette(gray(seq(0.5,1,len=6)))
palette()
```

```
[1] "#808080" "gray60"  "gray70"  "gray80"  "#E6E6E6" "white"
```

```
barplot(bird, beside = T,col=palette(),legend = T)
abline(h=0)
```

```
barplot(bird,beside = T,col=palette())
legend(x='topright',legend=rownames(bird),fill = palette())
abline(h=0)
palette('default')
#^ means "create superscript
title(xlab = expression('bird'^Residence))
#subscript enclose the part you want in square brackets
title(ylab = expression('bird'['Habitat']))
#two sets of quoted text, one outside the [] and the other insided the []
title(main = "Superscript\nand\nSubscript")
```

Superscript and Subscript

$bird_{Habitat}$ (y-axis)

$bird^{Residence}$ (x-axis)

Legend:
- Blackbird
- Chaffinch
- Great Tit
- House Sparrow
- Robin
- Song Thrush

Categories: Garden, Hedgerow, Parkland, Pasture, Woodland