

Introduction to R Workshop Series

Base R Plotting Demo

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This document provides examples of several kinds of plots in base R. It is designed to call attention to the step-by-step walkthrough in the associated text file (http://saraemilyburke.com/stats/rworkshop_plotting_demo.r). I wrote the code and comments in that file in response to a request to cover more plotting basics in my Introduction to R Workshop Series in Spring 2020.

The code below generates a PDF containing the plots on the subsequent pages. This code is included, along with more explanation, in the text file linked above.

```
##### Initial setup

### Make some fake data
set.seed(21)
dat = data.frame(
  type = factor(rep(c("dachshund", "beagle", "basenji", "greyhound"), each=50)),
  wags = c(rbinom(50, 50, .5), rbinom(50, 65, .5), rbinom(50, 40, .5), rbinom(50, 55, .5))
  dat$wags[1:35] = NA # Set some values to missing so we have to deal with them
  dat$borks = round(dat$wags/4)+rbinom(200, 10, .5) # To use for scatterplot

### Define a standard error function for later convenience
standard.error = function(x) {
  return(sqrt(var(x, na.rm=T)/sum(!is.na(x)))) }

### Retrieve some useful information for plotting
m = with(dat, tapply(wags, type, mean, na.rm=T))
se = with(dat, tapply(wags, type, standard.error))
mod = lm(borks~wags, data=dat)
minmaxwags = with(dat, c(min(wags, na.rm=T), max(wags, na.rm=T)))
fittedborks = predict(mod, newdata=data.frame(wags=minmaxwags))
```

```
##### Write five example plots to PDF

pdf("Five dog-related plots.pdf",6,6) # Start writing to a pdf

## Box plot
par(mar=c(5,4,1,1))
boxplot(wags~type,data=dat,ylim=c(0,45),ylab="Wags",xlab="Type of Dog")
points(1:4,m,pch=16,col="blue")
for (i in 1:4) {lines(c(i,i),c(m[i]-se[i],m[i]+se[i]),col="blue",lwd=2)}

## Bar plot
par(mar=c(5,4,1,1))
barplot(m,ylab="Wags",ylim=c(0,35),xlab="Type of Dog")
xcoords = c(.7,1.9,3.1,4.3)
for (i in 1:4) {lines(rep(xcoords[i],2),c(m[i]-se[i],m[i]+se[i]),lwd=2)}

## Individual points + means
par(mar=c(4,3,1,1))
plot(wags~as.numeric(type),data=dat,xaxt="none",xlim=c(.3,4.7),ylim=c(0,45),
     mgp=c(2,.5,0),tcl=-.3,ylab="Wags",xlab="Type of Dog",pch=16,col="#00000020")
mtext(levels(dat$type),side=1,at=1:4)
points(1:4+.1,m,pch=16,col="blue")
for (i in 1:4) {lines(c(i,i)+.1,c(m[i]-se[i],m[i]+se[i]),col="blue",lwd=2)}

## Shaded scatterplot
par(mar=c(4,3,1,1))
plot(borks~wags,data=dat,xlim=c(0,45),ylim=c(0,18),xlab="Wags",ylab="Borks",
     pch=16,col="#00000050",mgp=c(2,.5,0),tcl=-.3)
lines(minmaxwags,fittedborks,lwd=2,col="blue")

## Color-coded scatterplot
colorselection = c("#ee1166","#6600ff","#33aa00","#00aaff")
pcols = as.character(dat$type)
for (i in 1:4) {pcols[pcols==levels(dat$type)[i]] = colorselection[i]}
par(mar=c(4,3,1,1))
plot(jitter(dat$wags,amount=.3),jitter(dat$borks,amount=.3),
     xlim=c(0,45),ylim=c(0,18),xlab="Wags",ylab="Borks",
     pch=16,col=pcols,mgp=c(2,.5,0),tcl=-.3)
legend(31,5,levels(dat$type),col=colorselection,pch=16)
lines(minmaxwags,fittedborks,lwd=2,col="black")

dev.off() # Finishes creating the pdf
```









