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The *R* Workshop

Applying the Integrated Suite of Software Facilities for Statistical Computing and Graphics

University of Georgia
Department of Workforce Education, Leadership, and Social Foundations
College of Education Research Office

January 23-January 24, 2012

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4. Graphics:
Visualization of Data

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Distribution of One-Dimensional Data

- Qualitative data
  - Bar chart: `barplot()`
  - Pie chart: `pie()`
- Quantitative data
  - Stem-and-leaf plot: `stem()`
  - Histogram: `hist()`
  - Boxplot: `boxplot()`

Graphics

```
## Beer Preference Example

beer <- c(3, 4, 1, 1, 3, 4, 3, 3, 1, 3, 2, 1, 2, 1, 2, 3, 2, 3, 1,
 1, 1, 1, 4, 3, 1)
# (1) Domestic can  (2) Domestic bottle,
# (3) Microbrew     (4) Import

barplot(table(beer))
barplot(table(beer)/length(beer),
  col=c("lightblue", "mistyrose", "lightcyan","cornsilk"),
  names.arg=c("Domestic can", "Domestic bottle", "Microbrew",
 "Import"),
  ylab="Relative frequency", main="Beer Preference Survey")

beer.counts <- table(beer) # store the table result
pie(beer.counts) # first pie -- kind of dull
names(beer.counts) <- c("Domestic\n can","Domestic\n bottle",
 "Microbrew","Import") # give names
pie(beer.counts) # prints out names
```

```
## Stem-and-leaf
scores <- c(2, 3, 16, 23, 14, 12, 4, 13, 2, 0, 0, 0,
   6, 28, 31, 14, 4, 8, 2, 5)
stem(scores)


## histogram
x <- rnorm(1000)  # To generate 1,000 random numbers from N(0,1)
hist(x, xlab="data")
hist(x, probability=T, xlab="data")
z <- seq(from=-3, to=3, by=0.01)
lines(z, dnorm(z), col=2)


## Boxplot
growth <- c(75,72,73,61,67,64,62,63) # the size of flies
sugar <- c("C","C","C","F","F","F","S","S") # diet
fly <- list(growth=growth, sugar=sugar)
boxplot(fly$growth)
jpeg(file="flygrowth.jpg", width=480, height=360)
```

Distribution of Multi-Dimensional Data

- Categorical and Quantitative Data

  Boxplot: `boxplot()`

- Qualitative and Quantitative Data

  Scatterplot: `plot()`

Graphics

```
## Boxplot
boxplot(growth~sugar, xlab="Sugar Type", ylab="Growth",
   main="Growth against sugar types", data=fly)


## Scatterplot
plot(cars$speed, cars$dist)
# the speed of cars and the distances taken to stop
attach(cars)
plot(speed, dist, col="blue", pch="+",
   ylab="Distance taken to stop", xlab="Speed",
   ylim=c(-20, 140))
lm(dist~speed)
abline(-17.579, 3.932, col="red")
title(main="Scatterplot with best fit line", font.main=4)
```


```
## Scatterplot matrix
attach(iris)
pairs(iris[,1:4])
pairs(iris[Species=="virginica", 1:4])


## 2D Histogram
library(hexbin)
plot(hexbin(iris[,3], iris[,4]),
  xlab="Petal Length", ylab="Petal Width")
```