R Handout - Basics and Terminology

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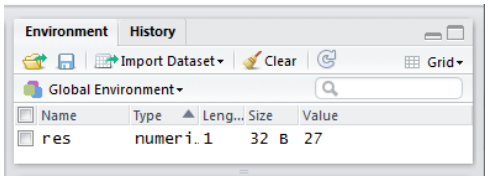
Load Necessary Packages

```
> library(FSA)      # for mrClosed
```

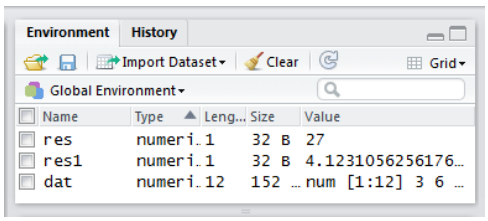
Expressions & Assignments

```
> 3+4*2             # this is an expression
[1] 11
> res <- 3+4*2      # but this is an assignment
> res               #   to see what was assigned to memory
[1] 11
> ( res <- 9+3*6 ) # assign AND view
[1] 27
```



Functions & Arguments

```
> sqrt(17)
[1] 4.123
> ( res1 <- sqrt(17) )
[1] 4.123
>
> dat <- c(3,6,8,3,5,6,2,7,6,8,2,10)
> mean(dat)
[1] 5.5
> mean(dat,trim=0.1)
[1] 5.4
```



Types of Functions

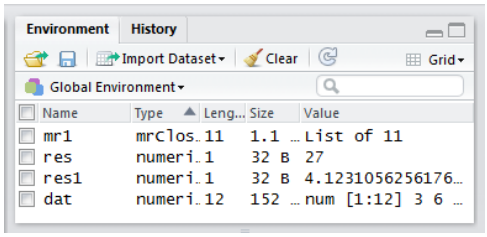
```
> mr1 <- mrClosed(M=346,n=184,m=49,type="Chapman")
> summary(mr1)
```

Used Chapman's modification of the Petersen method with M=346, n=184, and m=49.

```
        N
[1,] 1283
> confint(mr1)
```

The binomial method was used.

```
     95% LCI 95% UCI
[1,]    1025    1636
```



Vectors & Data Types

```
> ( lake <- c("Star","Twin","Long","Deep") )
[1] "Star" "Twin" "Long" "Deep"
> ( numSpec <- c(4,8,7,3) )
[1] 4 8 7 3
> ( maxDepth <- c(6.5,7.8,3.8,25.6) )
[1]  6.5  7.8  3.8 25.6
> ( springFed <- c(TRUE,FALSE,FALSE,TRUE) )
[1]  TRUE FALSE FALSE  TRUE
```

```
> lake[1]
[1] "Star"
> lake[2]
[1] "Twin"
> lake[c(1,2)]
[1] "Star" "Twin"
> lake[-1]
[1] "Twin" "Long" "Deep"
> lake[c(TRUE,FALSE,FALSE,TRUE)]
[1] "Star" "Deep"
> lake=="Star"
[1]  TRUE FALSE FALSE FALSE
> maxDepth[lake=="Star"]
[1] 6.5
> numSpec[maxDepth<7]
[1] 4 7
```

Data.frames

```
> # Put previous vectors into a data.frame.  For realistic sizes of data sets
> #   I would enter data externally and read into R ... more on this later
> ( df <- data.frame(lake,numSpec,maxDepth,springFed) )
  lake numSpec maxDepth springFed
1 Star       4      6.5      TRUE
2 Twin       8      7.8     FALSE
3 Long       7      3.8     FALSE
4 Deep       3     25.6      TRUE
> df[1,1]
[1] Star
Levels: Deep Long Star Twin
> df[1,]
  lake numSpec maxDepth springFed
1 Star       4      6.5      TRUE
> df[c(1,2),]
  lake numSpec maxDepth springFed
1 Star       4      6.5      TRUE
2 Twin       8      7.8     FALSE
> df[-1,]
  lake numSpec maxDepth springFed
2 Twin       8      7.8     FALSE
3 Long       7      3.8     FALSE
4 Deep       3     25.6      TRUE
> df[,2]
[1] 4 8 7 3
> df[,"numSpec"]
[1] 4 8 7 3
```

```
> str(df)
'data.frame': 4 obs. of  4 variables:
 $ lake     : Factor w/ 4 levels "Deep","Long",..: 3 4 2 1
 $ numSpec  : num  4 8 7 3
 $ maxDepth : num  6.5 7.8 3.8 25.6
 $ springFed: logi  TRUE FALSE FALSE TRUE
> df$numSpec
[1] 4 8 7 3
> df$numSpec[1]
[1] 4
> mean(df$numSpec)
[1] 5.5
```