

> R
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Warwick R Users Group: Going Batty with Lists and Dataframes

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The Problem Dataset

Working with Bat Echolocation Call Recordings

Anpa

F



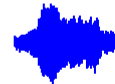
Arja

M



Leye

F



Some Observatons on Individual Bats

Data Structures

Base Data Structures in R

Homogenous Data

- Atomic Vector
- Matrix
- Array

Heterogenous Data

- List
- Dataframe

A List

```
x <- list(list(1, 2), c(3, 4), c(letters[1:4]))
```

```
str(x)
```

```
## List of 3  
## $ :List of 2  
## ..$ : num 1  
## ..$ : num 2  
## $ : num [1:2] 3 4  
## $ : chr [1:4] "a" "b" "c" "d"
```

"Lists are sometimes referred to as recursive vectors as a list may contain other lists."

A Dataframe

```
df <- data.frame(  
  x = 1:3,  
  y = c("a", "b", "c"),  
  stringsAsFactors = FALSE)
```

```
str(df)
```

```
## 'data.frame':  3 obs. of  2 variables:  
## $ x: int  1 2 3  
## $ y: chr  "a" "b" "c"
```

"A dataframe is a list of equal-length vectors"

The Dataframe's Columns as a List

```
df$z <- list(1:2, 1:3, 1:4)
```

```
df
```

```
##   x y      z
## 1 1 a     1, 2
## 2 2 b     1, 2, 3
## 3 3 c     1, 2, 3, 4
```


Another Approach

```
data.frame(x = 1:3, y = list(1:2, 1:3, 1:4))
```

Error in (function (... , row.names = NULL, check.rows = FALSE, check.names = TRUE, : arguments imply differing number of rows: 2, 3, 4

```
df1 <- data.frame(x = 1:3, y = I(list(1:2, 1:3, 1:4)))  
str(df1)
```

```
## 'data.frame':   3 obs. of  2 variables:  
## $ x: int  1 2 3  
## $ y:List of 3  
## ..$ : int  1 2  
## ..$ : int  1 2 3  
## ..$ : int  1 2 3 4  
## ..- attr(*, "class")= chr "AsIs"
```

Back to the Bats

Observations from Mexican Bats

```
library('ancestralbat')  
dim(mexicancalls)
```

```
## [1] 449 36
```

```
mexicancalls[c(1,61,220), 1:6]
```

```
##      species sex      chirp1      chirp2      chirp3 chirp4  
## 1      Anpa  F -0.01189.... 0.006043....      NA      NA  
## 61     Arja  M -0.03671....      NA      NA      NA  
## 220    Leye  F -0.03378.... -0.05170.... -0.24080....      NA
```