

R Data Structures

Vector

- 1D Data Structure of fixed type

scores		
1	0.8	"bob"
2	1.2	"dave"
3	3.3	"mary"
4	1.8	"sue"
5	2.7	"alan"

scores[2]
scores[c(2, 4, 3)]
scores[3:5]
scores["mary"]
scores[c("mary", "sue")]

List

- Collection of vectors

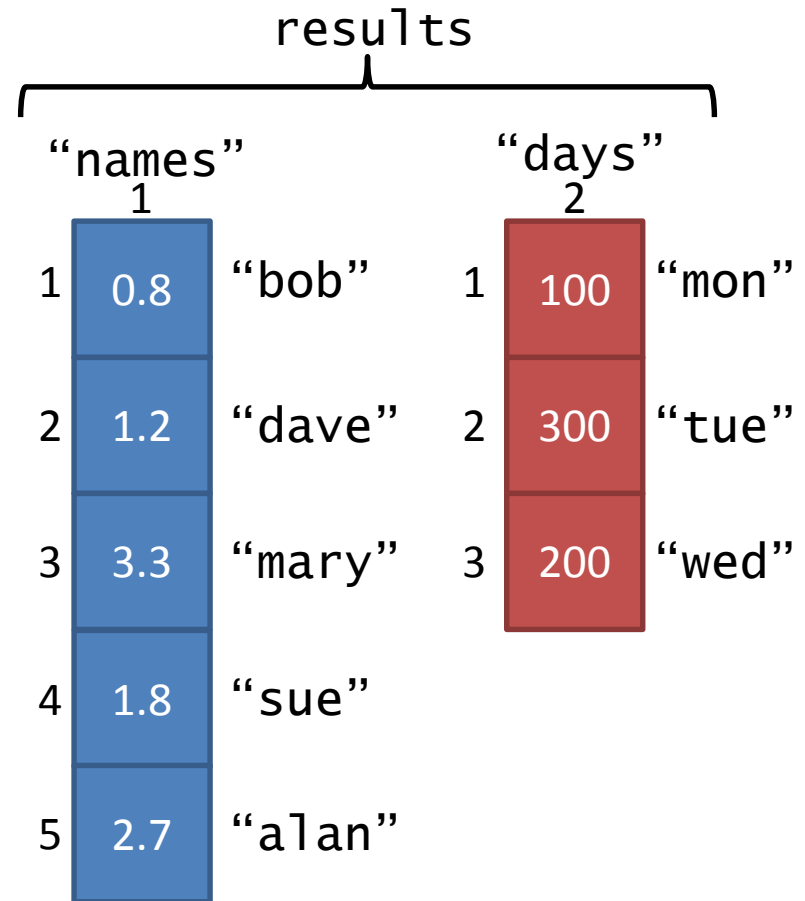
```
results[[1]]
```

```
results[["days"]]
```

```
results$days
```

```
results$days[2:3]
```

```
results[[1]][“sue”]
```



Data Frame

- Collection of vectors with same lengths

```
all.results[[1]]  
all.results[["tue"]]  
all.results$wed  
  
all.results[5,2]  
all.results[1:3,c(2,4)]  
all.results[c("bob", "dave"),]  
all.results[,2:3]
```

all.results

		"mon"	"tue"	"wed"	"pass"
		1	2	3	4
"bob"	1	0.8	0.9	0.8	T
"dave"	2	0.6	0.7	0.5	F
"mary"	3	0.2	0.3	0.3	F
"sue"	4	0.8	0.8	0.9	T
"alan"	5	0.6	1.0	0.9	T

Creating lists / data frames

- `list(vector1, vector2, vector3)`
- `data.frame(vector1, vector2, vector3)`

- `list(names=vector1, values=vector2)`
- `data.frame(names=vector1, values=vector2)`

- `names(my.list) <- c("age", "height", "score")`
- `colnames(my.df) <- c("age", "height", "score")`
- `rownames(my.df) <- c("bob", "dave", "mary", "sue")`

Spot the mistakes

```
vec1 <- c(31,47,15 52,13)
```

Error: unexpected numeric constant in "vec1 <- c(31,47,15 52"

```
vec2 <- c("Alfie","Bob","Chris",Dave,"Ed")
```

Error: object 'Dave' not found

```
vec3 <- (TRUE,TRUE,FALSE, TRUE ,FALSE)
```

Error: unexpected ',' in "vec3 <- (TRUE,"

```
vec4 <- c[41, 67]
```

Error in c[41, 67] : object of type 'builtin' is not subsettable``

```
vec5 <- c("Alfie","Bob","Chris","Dave")
```

Error: unexpected symbol in "vec5 <- c("Alfie","Bob","Chris"

Spot the mistakes

```
my.vector(1:5)
```

```
Error: could not find function "my.vector"
```

```
my.vector[2,3,4]
```

```
Error in my.vector[2, 3, 4] : incorrect number of  
dimensions
```

```
my.list[2]
```

```
[No error! works - but don't do this]
```

```
my.data.frame[2:4]
```

```
Error in `[.data.frame'](my.data.frame, 2:4) :  
undefined columns selected
```

```
nrow(my.data.frame)
```

```
[1] 10
```

```
my.data.frame[300,]
```

```
      a  b  c  
NA NA NA NA
```