



INTRODUCTION TO R

Subset - Extend - Sort Data Frames

Subset Data Frame

- Subsetting syntax from matrices and lists
- `[` from matrices
- `[[` and `$` from lists

people

```
> name <- c("Anne", "Pete", "Frank", "Julia", "Cath")
> age <- c(28, 30, 21, 39, 35)
> child <- c(FALSE, TRUE, TRUE, FALSE, TRUE)
> people <- data.frame(name, age, child,
                        stringsAsFactors = FALSE)
```

```
> people
  name age child
1 Anne  28 FALSE
2 Pete  30  TRUE
3 Frank 21  TRUE
4 Julia 39 FALSE
5 Cath  35  TRUE
```

Subset Data Frame

```
> people[3,2]
[1] 21

> people[3,"age"]
[1] 21

> people[3,]
  name age child
3 Frank  21  TRUE

> people[, "age"]
[1] 28 30 21 39 35
```

```
> people
  name age child
1  Anne  28 FALSE
2  Pete  30  TRUE
3 Frank  21  TRUE
4 Julia  39 FALSE
5  Cath  35  TRUE
```

Subset Data Frame

```
> people[c(3, 5), c("age", "child")]
```

```
  age child
3  21  TRUE
5  35  TRUE
```

```
> people[2]
```

```
  age
1  28
2  30
3  21
4  39
5  35
```

```
> people
  name age child
1  Anne  28 FALSE
2  Pete  30  TRUE
3  Frank 21  TRUE
4  Julia 39 FALSE
5  Cath  35  TRUE
```

Data Frame ~ List

```
> people$age
[1] 28 30 21 39 35

> people[["age"]]
[1] 28 30 21 39 35

> people[[2]]
[1] 28 30 21 39 35
```

```
> people
  name age child
1  Anne  28 FALSE
2  Pete  30  TRUE
3 Frank  21  TRUE
4 Julia  39 FALSE
5  Cath  35  TRUE
```

Data Frame ~ List

```
> people["age"]
```

```
age
```

```
1  28
```

```
2  30
```

```
3  21
```

```
4  39
```

```
5  35
```

```
> people[2]
```

```
age
```

```
1  28
```

```
2  30
```

```
3  21
```

```
4  39
```

```
5  35
```

```
> people
```

```
  name age child
```

```
1  Anne  28 FALSE
```

```
2  Pete  30  TRUE
```

```
3 Frank  21  TRUE
```

```
4 Julia  39 FALSE
```

```
5  Cath  35  TRUE
```

Extend Data Frame

- Add columns = add variables
- Add rows = add observations

Add column

```
> height <- c(163, 177, 163, 162, 157)
```

```
> people$height <- height
```

```
> people[["height"]] <- height
```

```
> people
```

	name	age	child	height
1	Anne	28	FALSE	163
2	Pete	30	TRUE	177
3	Frank	21	TRUE	163
4	Julia	39	FALSE	162
5	Cath	35	TRUE	157

Add column

```
> weight <- c(74, 63, 68, 55, 56)
```

```
> cbind(people, weight)
```

	name	age	child	height	weight
1	Anne	28	FALSE	163	74
2	Pete	30	TRUE	177	63
3	Frank	21	TRUE	163	68
4	Julia	39	FALSE	162	55
5	Cath	35	TRUE	157	56

Add row

```
> tom <- data.frame("Tom", 37, FALSE, 183)

> rbind(people, tom)
Error : names do not match previous names

> tom <- data.frame(name = "Tom", age = 37,
                    child = FALSE, height = 183)

> rbind(people, tom)
  name age child height
1 Anne  28 FALSE   163
2 Pete  30  TRUE   177
3 Frank 21  TRUE   163
4 Julia 39 FALSE   162
5 Cath  35  TRUE   157
6   Tom  37 FALSE   183
```

Sorting

```
> sort(people$age)
[1] 21 28 30 35 39

> ranks <- order(people$age)
> ranks
[1] 3 1 2 5 4

> people$age
[1] 28 30 21 39 35
```

21 is lowest: its index, 3, comes first in ranks

28 is second lowest: its index, 1, comes second in ranks

39 is highest: its index, 4, comes last in ranks

```
> people
  name age child height
1 Anne  28 FALSE   163
2 Pete  30  TRUE   177
3 Frank 21  TRUE   163
4 Julia 39 FALSE   162
5 Cath  35  TRUE   157
```

Sorting

```
> sort(people$age)
[1] 21 28 30 35 39

> ranks <- order(people$age)
> ranks
[1] 3 1 2 5 4

> people[ranks, ]
  name age child height
3 Frank  21  TRUE   163
1  Anne  28 FALSE   163
2  Pete  30  TRUE   177
5  Cath  35  TRUE   157
4 Julia  39 FALSE   162
```

```
> people
  name age child height
1  Anne  28 FALSE   163
2  Pete  30  TRUE   177
3 Frank  21  TRUE   163
4 Julia  39 FALSE   162
5  Cath  35  TRUE   157
```

Sorting

```
> sort(people$age)
[1] 21 28 30 35 39

> ranks <- order(people$age)
> ranks
[1] 3 1 2 5 4

> people[order(people$age, decreasing = TRUE), ]
  name age child height
4 Julia  39 FALSE   162
5 Cath  35  TRUE   157
2 Pete  30  TRUE   177
1 Anne  28 FALSE   163
3 Frank 21  TRUE   163
```

```
> people
  name age child height
1 Anne  28 FALSE   163
2 Pete  30  TRUE   177
3 Frank 21  TRUE   163
4 Julia 39 FALSE   162
5 Cath  35  TRUE   157
```



INTRODUCTION TO R

Let's practice!