R Programming Notes

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Week 1

Subsetting

There are three subsetting commands: "[", "]]", and "$".

- "[" always returns an object of the same class and allows you to subset multiple elements from an object.
- "[[" extracts elements from a list or data.frame.
- "$" extracts elements from a list or data.frame by name specifically.

Note: "[[" can be used to extract with a *computed* indicies, whereas "$" can only subset by name.

```
x <- list(foo = 1:4, bar = 0.6, baz = "hello")

name <- "foo"

x[[name]]
```

```
## [1] 1 2 3 4
```

```
x$name
```

```
## NULL
```

```
x$foo
```

```
## [1] 1 2 3 4
```

Note Subsetting a matrix with "[" default behavor returns a vector of the subset (dimensions are lost). To prevent this behavior, set "drop = false".

```
x <- matrix (1:6, 2, 3)
x[1,]
```

```
## [1] 1 3 5
```

```
x[1, , drop = F]
```

```
##      [,1] [,2] [,3]
## [1,]    1    3    5
```

Removing NA values

One of the most common tasks is removing null/NA values. The general workflow is to create a new vector or matrix that defines the location of the NA values, and then subset the original matrix based on this index.

e.g.

```
x <- c(1, 2, NA, 4, NA, 5)
bad <- is.na(x)
x[!bad]
```

```
## [1] 1 2 4 5
```

Note the "!" or bang symbol can be used to indicates inversion.

Sometimes you need to subset multiple things (e.g. need values for both the control and the treatment group). This can be done with the *complete.cases* function.

```
x <- c(1, 2, NA, 4, NA, 5)
y <- c("a", NA, "c", "d", "e", "f")
good <- complete.cases(x, y)
x[good]
```

```
## [1] 1 4 5
```

```
y[good]
```

```
## [1] "a" "d" "f"
```

complete.cases can also be used on data.frames

```
airquality[1:6, ]
```

```
##   Ozone Solar.R Wind Temp Month Day
## 1    41     190  7.4   67     5   1
## 2    36     118  8.0   72     5   2
## 3    12     149 12.6   74     5   3
## 4    18     313 11.5   62     5   4
## 5    NA      NA 14.3   56     5   5
## 6    28      NA 14.9   66     5   6
```

```
good <- complete.cases(airquality)
airquality[good, ][1:6, ]
```

```
##   Ozone Solar.R Wind Temp Month Day
## 1    41     190  7.4   67     5   1
## 2    36     118  8.0   72     5   2
## 3    12     149 12.6   74     5   3
## 4    18     313 11.5   62     5   4
## 7    23     299  8.6   65     5   7
## 8    19      99 13.8   59     5   8
```