

# Matrices

Matrices are vectors with a *dimension* attribute. The dimension attribute is itself an integer vector of length 2 (nrow, ncol)

```
> m <- matrix(nrow = 2, ncol = 3)
> m
      [,1] [,2] [,3]
[1,]   NA   NA   NA
[2,]   NA   NA   NA
> dim(m)
[1] 2 3
> attributes(m)
$dim
[1] 2 3
```

# Matrices (cont'd)

Matrices are constructed *column-wise*, so entries can be thought of starting in the “upper left” corner and running down the columns.

```
> m <- matrix(1:6, nrow = 2, ncol = 3)
> m
      [,1] [,2] [,3]
[1,]    1    3    5
[2,]    2    4    6
```

# Matrices (cont'd)

Matrices can also be created directly from vectors by adding a dimension attribute.

```
> m <- 1:10
> m
[1] 1 2 3 4 5 6 7 8 9 10
> dim(m) <- c(2, 5)
> m
      [,1] [,2] [,3] [,4] [,5]
[1,]    1    3    5    7    9
[2,]    2    4    6    8   10
```

# cbind-ing and rbind-ing

Matrices can be created by *column-binding* or *row-binding* with `cbind()` and `rbind()`.

```
> x <- 1:3
> y <- 10:12
> cbind(x, y)
      x y
[1,] 1 10
[2,] 2 11
[3,] 3 12
> rbind(x, y)
      [,1] [,2] [,3]
x         1     2     3
y        10    11    12
```