

# R Generate and Combine Fixed and Random Matrix

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## 1 Generate Matrixes

Go to the [RMD](#), [R](#), [PDF](#), or [HTML](#) version of this file. Go back to [fan's REconTools](#) Package, [R Code Examples](#) Repository ([bookdown site](#)), or [Intro Stats with R](#) Repository ([bookdown site](#)).

### 1.1 Create a N by 2 Matrix from 3 arrays

Names of each array become row names automatically.

```
ar_row_one <- c(-1,+1)
ar_row_two <- c(-3,-2)
ar_row_three <- c(0.35,0.75)

mt_n_by_2 <- rbind(ar_row_one, ar_row_two, ar_row_three)
kable(mt_n_by_2) %>%
  kable_styling_fc()
```

|              |       |       |
|--------------|-------|-------|
| ar_row_one   | -1.00 | 1.00  |
| ar_row_two   | -3.00 | -2.00 |
| ar_row_three | 0.35  | 0.75  |

### 1.2 Name Matrix Columns and Rows

```
# An empty matrix with Logical NA
mt_named <- matrix(data=NA, nrow=2, ncol=2)
colnames(mt_named) <- paste0('c', seq(1,2))
rownames(mt_named) <- paste0('r', seq(1,2))
mt_named
```

```
##      c1 c2
## r1 NA NA
## r2 NA NA
```

### 1.3 Generate NA Matrix

- Best way to allocate matrix in R, NULL vs NA?

Allocate with NA or NA\_real\_ or NA\_int\_. Clarity in type definition is preferred.

```
# An empty matrix with Logical NA
mt_na <- matrix(data=NA, nrow=2, ncol=2)
str(mt_na)

## logi [1:2, 1:2] NA NA NA NA

# An empty matrix with numerica NA
mt_fl_na <- matrix(data=NA_real_, nrow=2, ncol=2)
mt_it_na <- matrix(data=NA_integer_, nrow=2, ncol=2)

str(mt_fl_na)

## num [1:2, 1:2] NA NA NA NA

str(mt_fl_na)

## num [1:2, 1:2] NA NA NA NA
```

### 1.4 Generate Random Matrixes

Random draw from the normal distribution, random draw from the uniform distribution, and combine resulting matrixes.

```
# Generate 15 random normal, put in 5 rows, and 3 columns
mt_rnorm <- matrix(rnorm(15,mean=0,sd=1), nrow=5, ncol=3)

# Generate 15 random normal, put in 5 rows, and 3 columns
mt_runif <- matrix(runif(15,min=0,max=1), nrow=5, ncol=5)

# Combine
mt_rnorm_runif <- cbind(mt_rnorm, mt_runif)

# Display
kable(mt_rnorm_runif) %>% kable_styling_fc_wide()
```

|            |            |            |           |           |           |           |           |
|------------|------------|------------|-----------|-----------|-----------|-----------|-----------|
| 1.1676236  | -1.9386566 | 0.3579625  | 0.7103083 | 0.3903475 | 0.1619343 | 0.7103083 | 0.3903475 |
| -0.6739924 | -0.5615611 | -0.6204664 | 0.7361028 | 0.5738153 | 0.3967366 | 0.7361028 | 0.5738153 |
| -0.4028037 | -0.0689906 | 0.8885335  | 0.9114172 | 0.4069060 | 0.7871675 | 0.9114172 | 0.4069060 |
| -0.7199085 | -1.9550838 | -0.1538384 | 0.0678065 | 0.4755571 | 0.8240295 | 0.0678065 | 0.4755571 |
| -0.8077243 | -0.1360316 | -2.3622675 | 0.2613640 | 0.5063549 | 0.4587020 | 0.2613640 | 0.5063549 |

### 1.5 Add Column to Matrix with Common Scalar Value

Given some matrix of information, add a column, where all rows of the column have the same numerical value. Use the matrix created prior. - R add column to matrix - r append column to matrix constant value

```
fl_new_first_col_val <- 111
fl_new_last_col_val <- 999
mt_with_more_columns <- cbind(rep(fl_new_first_col_val, dim(mt_rnorm_runif)[1]),
                             mt_rnorm_runif,
                             rep(fl_new_last_col_val, dim(mt_rnorm_runif)[1]))
```

```
# Display
kable(mt_with_more_columns) %>% kable_styling_fc_wide()
```

|     |            |            |            |           |           |           |           |           |     |
|-----|------------|------------|------------|-----------|-----------|-----------|-----------|-----------|-----|
| 111 | 1.1676236  | -1.9386566 | 0.3579625  | 0.7103083 | 0.3903475 | 0.1619343 | 0.7103083 | 0.3903475 | 999 |
| 111 | -0.6739924 | -0.5615611 | -0.6204664 | 0.7361028 | 0.5738153 | 0.3967366 | 0.7361028 | 0.5738153 | 999 |
| 111 | -0.4028037 | -0.0689906 | 0.8885335  | 0.9114172 | 0.4069060 | 0.7871675 | 0.9114172 | 0.4069060 | 999 |
| 111 | -0.7199085 | -1.9550838 | -0.1538384 | 0.0678065 | 0.4755571 | 0.8240295 | 0.0678065 | 0.4755571 | 999 |
| 111 | -0.8077243 | -0.1360316 | -2.3622675 | 0.2613640 | 0.5063549 | 0.4587020 | 0.2613640 | 0.5063549 | 999 |