R Matrix Exercises

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Through these exercises we will review the matrix data structure and perhaps introduce you to a few ideas for you to discover on your own!

Create 2 vectors A and B, where A is (1,2,3) and B is (4,5,6). With these vectors, use the `cbind()` or `rbind()` function to create a 2 by 3 matrix from the vectors. You'll need to figure out which of these binding functions is the correct choice. First, create 2 vectors A and B

```
A <- c(1,2,3)
B <- c(4,5,6)
```

Then, to create a 2 by 3 matrix from `rbind()` function

```
rbind(A,B)
```

```
##   [,1] [,2] [,3]
## A    1    2    3
## B    4    5    6
```

Create a 3 by 3 matrix consisting of the numbers 1-9. Assign this matrix to the variable *`mat`*

First, create a vector consisting of the number 1-9

```
n <- 1:9
n
```

```
## [1] 1 2 3 4 5 6 7 8 9
```

Then, convert the vector into a 3 by 3 matrix and name it `mat`.

```
mat <- matrix(n, nrow = 3)
mat
```

```
##      [,1] [,2] [,3]
## [1,]    1    4    7
## [2,]    2    5    8
## [3,]    3    6    9
```

Confirm that *`mat`* is a matrix.

```
is.matrix(mat)
```

```
## [1] TRUE
```

Create a 5 by 5 matrix consisting of the numbers 1-25 and assign it to the variable *mat2*. The top row should be the numbers 1-5.

```
v <- 1:25
mat2 <- matrix(v, ncol = 5, byrow = 1)
mat2
```

```
##      [,1] [,2] [,3] [,4] [,5]
## [1,]    1    2    3    4    5
## [2,]    6    7    8    9   10
## [3,]   11   12   13   14   15
## [4,]   16   17   18   19   20
## [5,]   21   22   23   24   25
```

Using indexing notation, grab a sub-section of *mat2* from the previous exercise that looks like this:

[7,8]
[12,13]

```
mat2
```

```
##      [,1] [,2] [,3] [,4] [,5]
## [1,]    1    2    3    4    5
## [2,]    6    7    8    9   10
## [3,]   11   12   13   14   15
## [4,]   16   17   18   19   20
## [5,]   21   22   23   24   25
```

```
mat2[2:3, 2:3]
```

```
##      [,1] [,2]
## [1,]    7    8
## [2,]   12   13
```

Using indexing notation, grab a sub-section of *mat2* from the previous exercise that looks like this:

[19,20]
[24,25]

```
mat2
```

```
##      [,1] [,2] [,3] [,4] [,5]
## [1,]    1    2    3    4    5
## [2,]    6    7    8    9   10
## [3,]   11   12   13   14   15
## [4,]   16   17   18   19   20
## [5,]   21   22   23   24   25
```

```
mat2[4:5, 4:5]
```

```
##      [,1] [,2]
## [1,]   19   20
## [2,]   24   25
```

What is the sum of all the elements in *mat2*?

```
sum(mat2)
```

```
## [1] 325
```

Find out how to use `runif()` to create a 4 by 5 matrix consisting of 20 random numbers.

```
randnum <- runif(20, min = 10, max = 100)
matrix(randnum, nrow = 4)
```

```
##          [,1]     [,2]     [,3]     [,4]     [,5]
## [1,] 31.50486 20.45562 54.19701 13.99624 26.53718
## [2,] 78.34096 59.96775 39.17996 70.88289 47.45952
## [3,] 52.45110 25.51087 10.66415 94.10219 18.40410
## [4,] 48.97028 11.65686 55.17057 30.76340 19.68887
```