HW0

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Cntl-alt-i (Creates the rmarkdown blocks)

```
#Replicate Function
rep(1:9, 3)#1 2 3...9 1 2...9 1..9
```

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

```
rep(5, 10)
```

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

```
#Sequence Generation
seq(from = 1, to = 9, by = 2)#1,3,5,..9
```

```
## [1] 1 3 5 7 9
```

```
seq(from = 1, to = 10, by = 2)
```

```
## [1] 1 3 5 7 9
```

```
v1 <- seq(from = 1, to = 9, by = 2)
length(v1)
```

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

```
v1 <- seq(from = 1, to = 9, by = 2)
rev(v1)#Reverse elements
```

```
## [1] 9 7 5 3 1
```

Run this code multiple times and notice the change.

```
sample(1:5, 10, replace = TRUE)#Random Samples and permutations.
```

```
##  [1] 3 2 4 1 2 1 1 2 5 5
```

Run this code and notice the change does not occur.

```
set.seed(30)#This is desirable for repoducible results for other researches
to check. For Random num generation. If #you want the same number repeditly.
sample(1:5, 10, replace = TRUE)
```

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

```r
samp <- sample(1:5, 10, replace = TRUE)
samp
```

```
##  [1] 1 2 3 5 2 5 2 5 4 3
```

```r
unique(samp)#Extracts Unique Elements
```

```
## [1] 1 2 3 5 4
```

```r
set.seed(2)
vec <- sample(seq(1, 100, by = 3), 15, replace = FALSE)
vec
```

```
##  [1] 19 70 55 16 85 82 10 67 37 40 73 91 49 88 25
```

```r
sort(vec, decreasing = FALSE)
```

```
##  [1] 10 16 19 25 37 40 49 55 67 70 73 82 85 88 91
```

Note the difference between sort() and order().

```r
order(vec, decreasing=FALSE)#Orders the "Ramk Number"
```

```
##  [1]  7  4  1 15  9 10 13  3  8  2 11  6  5 14 12
```

```r
vec <- sample(seq(0, 10, by=0.0001), 5, replace = TRUE)
vec
```

```
## [1] 8.5355 9.7640 2.2582 4.4481 0.7498
```

```r
round(vec, digits = 2)
```

```
## [1] 8.54 9.76 2.26 4.45 0.75
```

```r
round(vec)
```

```
## [1]  9 10  2  4  1
```

```r
vec <- sample(seq(0, 10, by = 0.0001), 10, replace = TRUE)
vec
```

```
##  [1] 6.6190 3.8755 8.3689 1.5050 3.4727 4.8877 1.4924 3.5706 9.6265 1.3237
```

```r
max(vec) #returns the maximum value
```

```
## [1] 9.6265
```

```r
which.max(vec) #returns the position of the maximum value
```

```
## [1] 9
```

```r
vec <- sample(1:10, 10, replace = TRUE)
vec
```

```
##  [1] 1 2 9 9 6 7 9 3 7 2
```

```
median(vec)
```

```
## [1] 6.5
```

```
mean(vec)
```

```
## [1] 5.5
```

```
sum(vec)
```

```
## [1] 55
```

Note the difference between cbind() and rbind().

```
seq1 <- seq(1, 10, by = 2)
seq2 <- seq(20, 100, by = 20)
cbind(seq1, seq2)
```

```
##      seq1 seq2
## [1,]    1   20
## [2,]    3   40
## [3,]    5   60
## [4,]    7   80
## [5,]    9  100
```

```
rbind(seq2, rev(seq1))
```

```
##      [,1] [,2] [,3] [,4] [,5]
## seq2   20   40   60   80  100
##         9    7    5    3    1
```

```
data(mtcars) #loads the data
head(mtcars) #returns the beginning of a vector/table/data frame, etc.
```

```
##                    mpg cyl disp  hp drat    wt  qsec vs am gear carb
## Mazda RX4         21.0   6  160 110 3.90 2.620 16.46  0  1    4    4
## Mazda RX4 Wag     21.0   6  160 110 3.90 2.875 17.02  0  1    4    4
## Datsun 710        22.8   4  108  93 3.85 2.320 18.61  1  1    4    1
## Hornet 4 Drive    21.4   6  258 110 3.08 3.215 19.44  1  0    3    1
## Hornet Sportabout 18.7   8  360 175 3.15 3.440 17.02  0  0    3    2
## Valiant           18.1   6  225 105 2.76 3.460 20.22  1  0    3    1
```

```
tail(mtcars) #returns the last part of a vector/table/data frame, etc.
```

```
##                 mpg cyl  disp  hp drat    wt qsec vs am gear carb
## Porsche 914-2  26.0   4 120.3  91 4.43 2.140 16.7  0  1    5    2
## Lotus Europa   30.4   4  95.1 113 3.77 1.513 16.9  1  1    5    2
## Ford Pantera L 15.8   8 351.0 264 4.22 3.170 14.5  0  1    5    4
## Ferrari Dino   19.7   6 145.0 175 3.62 2.770 15.5  0  1    5    6
```

```
## Maserati Bora  15.0   8 301.0 335 3.54 3.570 14.6  0  1    5    8
## Volvo 142E     21.4   4 121.0 109 4.11 2.780 18.6  1  1    4    2
```

```
dim(mtcars)
```

```
## [1] 32 11
```

```
nrow(mtcars)
```

```
## [1] 32
```

```
ncol(mtcars)
```

```
## [1] 11
```