Exercise1

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#Sum of 100.1, 234.9 and 12.01  
sum(100.1, 234.9, 12.01)

## [1] 347.01

# The square root of 256  
sqrt(256)

## [1] 16

#logarithm and cos  
log10(100)\*cos(pi)

## [1] -2

#cumulative sum of 2,3,4,5,6  
x<-c(2,3,4,5,6)  
cumsum(x)

## [1] 2 5 9 14 20

#Reverse cumsum  
y<- rev(x)  
cumsum(y)

## [1] 6 11 15 18 20

#Random numbers between 0 and 100  
random <- 0:100  
sample(random,size = 10, replace = TRUE)

## [1] 38 80 94 6 39 97 14 89 27 26

#Using runi  
round(runif(10, min = 0, max = 100))

## [1] 3 3 31 11 90 71 34 14 30 74

num1 <-10  
num2 <- 20  
result <- num1 \* num2  
result

## [1] 200

ls()

## [1] "num1" "num2" "random" "result" "x" "y"

myvect <- c(num1, num2, result)  
min(myvect) #min vale

## [1] 10

max(myvect) #max value

## [1] 200

var(myvect) # variance

## [1] 11433.33

rm(myvect)  
rainfall <-c( 0.1, 0.6, 33.8, 1.9, 9.6, 4.3, 33.7, 0.3, 0.0, 0.1)  
#Mean rainfall  
mean(rainfall)

## [1] 8.44

#standard deviation  
sd(rainfall)

## [1] 13.66473

#Cumulative rainfall  
cumsum(rainfall)

## [1] 0.1 0.7 34.5 36.4 46.0 50.3 84.0 84.3 84.3 84.4

#Day with highest rainfall   
which.max(rainfall)

## [1] 3

# cylinders 2.1, 3.4, 2.5, 2.7, 2.9  
cylinder\_length <- c( 2.1, 3.4, 2.5, 2.7, 2.9)  
cylinder\_diameter <- c(0.3, 0.5, 0.6, 0.9, 1.1)  
# correlation  
cor(cylinder\_length,cylinder\_diameter)

## [1] 0.3282822

#Calculating the volume  
volume <- (cylinder\_length\*pi\*(cylinder\_diameter/2)^2)  
volume

## [1] 0.1484403 0.6675884 0.7068583 1.7176658 2.7559622

#Mean volume  
mean\_volume <- mean(volume)  
mean\_volume

## [1] 1.199303

#Standard deviation  
sd\_volume <- sd(volume)  
sd\_volume

## [1] 1.039402

#coefficient of variation  
cv\_volume <- (sd\_volume/mean\_volume)\*100  
cv\_volume

## [1] 86.66714

volume\_mm3 <- volume\*1000  
volume\_mm3

## [1] 148.4403 667.5884 706.8583 1717.6658 2755.9622

#Working with alphabets  
alphabet <- c("A", "B", "C", "D")  
rep(alphabet, each = 3)

## [1] "A" "A" "A" "B" "B" "B" "C" "C" "C" "D" "D" "D"

rep(alphabet, times = 3)

## [1] "A" "B" "C" "D" "A" "B" "C" "D" "A" "B" "C" "D"

sort(sample(letters, 10, replace = TRUE))

## [1] "c" "c" "f" "g" "h" "n" "p" "v" "w" "x"

vec1 <- c(sample(letters, 5, replace = TRUE), sample(LETTERS, 5, replace = TRUE))  
sort(vec1)

## [1] "c" "e" "E" "j" "j" "K" "L" "O" "r" "Y"

rev(sort(vec1))

## [1] "Y" "r" "O" "L" "K" "j" "j" "E" "e" "c"

x <- c(1,2,5,9,11)  
 y <- c(2,5,1,0,23)  
 intersect(x,y)

## [1] 1 2 5

setdiff(x,y)

## [1] 9 11

union(x,y)

## [1] 1 2 5 9 11 0 23

mat1 <- matrix(runif(10\*10, min = 0, max = 1), nrow = 10, ncol = 10)  
 mat1

## [,1] [,2] [,3] [,4] [,5] [,6]  
## [1,] 0.81858601 0.980968848 0.06716479 0.18212791 0.2086827 0.1256511  
## [2,] 0.87848963 0.431205475 0.87085106 0.55029350 0.8181193 0.9506903  
## [3,] 0.01711464 0.355998561 0.28714421 0.65150719 0.9531292 0.2717849  
## [4,] 0.06698073 0.893119168 0.75359184 0.69473292 0.9095982 0.2092875  
## [5,] 0.11103828 0.210986729 0.01100832 0.07359261 0.3008050 0.4254612  
## [6,] 0.04272025 0.407452165 0.49740365 0.99864039 0.8595937 0.9303967  
## [7,] 0.46399173 0.142139255 0.09950049 0.48070424 0.8642594 0.1010965  
## [8,] 0.48162632 0.362120474 0.57577304 0.78880341 0.8737065 0.8695936  
## [9,] 0.27015184 0.008528176 0.22675571 0.63601268 0.5214854 0.6228041  
## [10,] 0.82921164 0.779742771 0.48626549 0.37550641 0.8418277 0.5315014  
## [,7] [,8] [,9] [,10]  
## [1,] 0.35871885 0.35382631 0.7713824 0.44624612  
## [2,] 0.31378897 0.49210238 0.3148000 0.70767811  
## [3,] 0.58368064 0.61185103 0.9624274 0.57776940  
## [4,] 0.42892203 0.97807354 0.7134828 0.08414732  
## [5,] 0.54209123 0.82647526 0.7146148 0.27484891  
## [6,] 0.16937481 0.63092339 0.4194719 0.90910942  
## [7,] 0.39494662 0.57806199 0.5927042 0.02944683  
## [8,] 0.08804325 0.54993550 0.8236426 0.16638025  
## [9,] 0.48242927 0.45782460 0.6503372 0.93297836  
## [10,] 0.44166141 0.06717654 0.9467572 0.30889910

row\_means = rowMeans(mat1)  
 row\_means

## [1] 0.4313355 0.6328019 0.5272407 0.5731936 0.3490922 0.5865086 0.3746851  
## [8] 0.5579625 0.4809307 0.5608550

sd(row\_means)

## [1] 0.09503288

hist(row\_means)

