

hom_3

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10/19/2021

#Q1

```
set.seed(12)
A = matrix(data = runif(n = 1:500), nrow = 50, ncol = 10)
colnames(A) = paste("lake", 1:10, sep = "_")

#get the mean value for each Lack
#for loop method
lake_means <- vector(mode = "numeric", length = ncol(A))

for (i in 1:ncol(A)) {
  lake_means[i] <- mean(A[,i])
}

names(lake_means) <- colnames(A)
lake_means

##   lake_1   lake_2   lake_3   lake_4   lake_5   lake_6   lake_7
lake_8
## 0.4601492 0.4992815 0.5987037 0.4580486 0.4719578 0.4965216 0.5110536
0.4577936
##   lake_9   lake_10
## 0.5193423 0.4856413

#vectorized function colMeans() method

colMeans(A)

##   lake_1   lake_2   lake_3   lake_4   lake_5   lake_6   lake_7
lake_8
## 0.4601492 0.4992815 0.5987037 0.4580486 0.4719578 0.4965216 0.5110536
0.4577936
##   lake_9   lake_10
## 0.5193423 0.4856413

#-----
#Q2

x = array(1:27, dim = c(3, 3, 3))
# apply(X = x, MARGIN = c(1, 2),
#       FUN = paste, collapse = ", ")
```

```
for (i in x[,1]){  
  for (j in x[,2]){  
    for (k in x[,3]){  
      print(paste(i,j,k, sep = ","))  
    }  
  }  
}
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#-----
#Q3

Fibonacci <- numeric(30)
Fibonacci[1] <- Fibonacci[2] <- 1
for (i in 3:30) Fibonacci[i] <- Fibonacci[i - 2] + Fibonacci[i - 1]
print("First 30 Fibonacci numbers:")

## [1] "First 30 Fibonacci numbers:"

print(Fibonacci)

```



```
## [1]      1      1      2      3      5      8     13     21     34     55
## [11]     89    144    233    377    610    987   1597   2584   4181   6765
## [21]  10946  17711  28657  46368  75025 121393 196418 317811 514229 832040
```

```
#-----
#Q4 & Q5
```

```
top105 = readLines("http://www.textfiles.com/music/ktop100.txt")
top105 = top105[-c(64, 65)] # missing No. 54 and 55
```

```
top105 <- grep("^\\d\\.?\\d?", top105, value = TRUE)
```

```
top105 <- sub("\\.?", "", top105)
```

```
top_105_num <- as.numeric(top105)
```

```
n_occur <- data.frame(table(top_105_num))
n_occur
```

```
##      top_105_num Freq
## 1              1     1
## 2              2     1
## 3              3     1
## 4              4     1
## 5              5     1
## 6              6     1
## 7              7     1
## 8              8     1
## 9              9     1
## 10             10     1
## 11             11     1
## 12             12     1
## 13             13     1
## 14             14     1
## 15             15     1
## 16             16     1
## 17             17     1
## 18             18     1
## 19             19     1
## 20             20     1
## 21             21     1
## 22             22     1
## 23             23     1
## 24             24     1
## 25             25     1
## 26             26     1
## 27             27     1
## 28             28     1
## 29             29     1
## 30             30     1
```

## 31	31	1
## 32	32	1
## 33	33	1
## 34	34	1
## 35	35	1
## 36	36	1
## 37	37	1
## 38	38	1
## 39	39	1
## 40	40	1
## 41	41	1
## 42	42	1
## 43	43	1
## 44	44	1
## 45	45	1
## 46	46	1
## 47	47	1
## 48	48	1
## 49	49	1
## 50	50	1
## 51	51	1
## 52	52	1
## 53	53	1
## 54	56	1
## 55	57	1
## 56	58	1
## 57	59	1
## 58	60	1
## 59	61	1
## 60	62	1
## 61	63	1
## 62	64	1
## 63	65	1
## 64	66	1
## 65	67	1
## 66	68	1
## 67	69	1
## 68	70	1
## 69	71	1
## 70	72	1
## 71	73	1
## 72	74	1
## 73	75	1
## 74	76	1
## 75	77	1
## 76	78	1
## 77	79	1
## 78	80	1
## 79	81	1
## 80	82	1

## 81	83	2
## 82	84	1
## 83	85	1
## 84	86	1
## 85	87	1
## 86	88	1
## 87	89	1
## 88	90	1
## 89	91	2
## 90	92	1
## 91	93	1
## 92	94	1
## 93	95	1
## 94	96	1
## 95	97	2
## 96	98	1
## 97	99	1
## 98	100	1
## 99	101	1
## 100	102	1
## 101	103	1
## 102	104	1
## 103	105	2