

# Homework\_03

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13/10/2021

##Question 1

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

```
## [1] "lake_1_0.460149239888415" "lake_2_0.499281540522352"
## [3] "lake_3_0.598703709831461" "lake_4_0.458048620996997"
## [5] "lake_5_0.471957847350277" "lake_6_0.496521633276716"
## [7] "lake_7_0.511053631124087" "lake_8_0.457793592582457"
## [9] "lake_9_0.519342335546389" "lake_10_0.485641260328703"
```

```
set.seed(12)
A = runif(n = 1:500)
x = matrix(A, nrow = 50, ncol = 10)

matrixMeans <- function(x)
{
  toReturn = numeric(ncol(x))
  for(ii in 1:ncol(x))
  {
    count = 0
    total = 0
    avg = 0
    for(jj in 1:nrow(x)){
      total = total + x[jj, ii]
      count = count + 1
      avg = total/count
    }
    print(paste("lake Nitrogen Concentration mean= ", avg))
  }
}

matrixMeans(x)
```

```
## [1] "lake Nitrogen Concentration mean= 0.460149239888415"
## [1] "lake Nitrogen Concentration mean= 0.499281540522352"
```

```
## [1] "lake Nitrogen Concentration mean= 0.598703709831461"
## [1] "lake Nitrogen Concentration mean= 0.458048620996997"
## [1] "lake Nitrogen Concentration mean= 0.471957847350277"
## [1] "lake Nitrogen Concentration mean= 0.496521633276716"
## [1] "lake Nitrogen Concentration mean= 0.511053631124087"
## [1] "lake Nitrogen Concentration mean= 0.457793592582457"
## [1] "lake Nitrogen Concentration mean= 0.519342335546389"
## [1] "lake Nitrogen Concentration mean= 0.485641260328703"
```

## Question 2

```
x = array(1:27, dim = c(3, 3, 3))
x
```

```
## , , 1
##
##      [,1] [,2] [,3]
## [1,]    1    4    7
## [2,]    2    5    8
## [3,]    3    6    9
##
## , , 2
##
##      [,1] [,2] [,3]
## [1,]   10   13   16
## [2,]   11   14   17
## [3,]   12   15   18
##
## , , 3
##
##      [,1] [,2] [,3]
## [1,]   19   22   25
## [2,]   20   23   26
## [3,]   21   24   27
```

```
for (i in 1:3) {
  for (j in 1:3) {
    for (k in 1:3) {
      print(paste(x[i, j, k], sep = ','))
    }
  }
}
```

```
## [1] "1"
## [1] "10"
## [1] "19"
## [1] "4"
## [1] "13"
## [1] "22"
```

```
## [1] "7"
## [1] "16"
## [1] "25"
## [1] "2"
## [1] "11"
## [1] "20"
## [1] "5"
## [1] "14"
## [1] "23"
## [1] "8"
## [1] "17"
## [1] "26"
## [1] "3"
## [1] "12"
## [1] "21"
## [1] "6"
## [1] "15"
## [1] "24"
## [1] "9"
## [1] "18"
## [1] "27"
```

### Question3

```
n <- 28
x <- numeric(n)
x[1] <- 0
x[2] <- 1
for (i in 3:n)
{
  x[i] <- x[i-1]+x[i-2]
}
print(x)
```

```
## [1] 0 1 1 2 3 5 8 13 21 34
## [11] 55 89 144 233 377 610 987 1597 2584 4181
## [21] 6765 10946 17711 28657 46368 75025 121393 196418
```

### Question4

```
library(stringr)
top105 = readLines("http://www.textfiles.com/music/ktop100.txt")
head(top105, n = 123)
```

```
## [1] "From: ed@wente.llnl.gov (Ed Suranyi)"
## [2] "Date: 12 Jan 92 21:23:55 GMT"
## [3] "Newsgroups: rec.music.misc"
## [4] "Subject: KITS' year end countdown"
## [5] ""
```

```

## [6] ""
## [7] "On Jan. 1, 1992, the \"Modern Rock\" station KITS San Francisco (\"Live-105\")"
## [8] "broadcast its list of the \"Top 105.3 of 1991.\" Here is the countdown"
## [9] "list:"
## [10] ""
## [11] "1. NIRVANA                SMELLS LIKE TEEN SPIRIT"
## [12] "2. EMF                    UNBELIEVABLE"
## [13] "3. R.E.M.                 LOSING MY RELIGION"
## [14] "4. SIOUXSIE & THE BANSHEES KISS THEM FOR ME"
## [15] "5. B.A.D. II              RUSH"
## [16] "6. RED HOT CHILI PEPPERS  GIVE IT AWAY"
## [17] "7. ELECTRONIC             GET THE MESSAGE"
## [18] "8. ERASURE                CHORUS"
## [19] "9. SCHOOL OF FISH        3 STRANGE DAYS"
## [20] "10. NORTHSIDE             TAKE FIVE"
## [21] "11. JESUS JONES           INTERNATIONAL BRIGHT YOUNG THING"
## [22] "12. DIVINYLS              I TOUCH MYSELF"
## [23] "13. SIMPLE MINDS          SEE THE LIGHTS"
## [24] "14. OMD                   PANDORA'S BOX"
## [25] "15. JAMES                 SIT DOWN"
## [26] "16. U2                    MYSTERIOUS WAYS"
## [27] "17. PSYCHEDELIC FURS      UNTIL SHE COMES"
## [28] "18. MOTORCYCLE BOY        HERE SHE COMES"
## [29] "19. MATERIAL ISSUE        VALERIE LOVES ME"
## [30] "20. R.E.M.               SHINY HAPPY PEOPLE"
## [31] "21. B.A.D. II            THE GLOBE"
## [32] "22. NED'S ATOMIC DUSTBIN  HAPPY"
## [33] "23. SEVEN RED SEVEN      THINKING OF YOU"
## [34] "24. BILLY BRAGG           SEXUALITY"
## [35] "25. ALISON MOYET          IT WON'T BE LONG"
## [36] "26. PRIMUS                JERRY WAS A RACE CAR DRIVER"
## [37] "27. VOICE OF THE BEEHIVE  MONSTERS & ANGELS"
## [38] "28. BLUR                  THERE'S NO OTHER WAY"
## [39] "29. HAVANA 3 A.M.         REACH THE ROCK"
## [40] "30. THE FIXX              HOW MUCH IS ENOUGH"
## [41] "31. TOP                   NUMBER ONE DOMINATOR"
## [42] "32. THE WONDER STUFF      CAUGHT IN MY ..."
## [43] "33. TRANSVISION VAMP      B WITH U"
## [44] "34. ROBYN HITCHCOCK      SO YOU THINK YOU'RE IN LOVE"
## [45] "35. CHAPTERHOUSE          PEARL"
## [46] "36. GARY CLAIL            HUMAN NATURE"
## [47] "37. MOODSWINGS            SPIRITUAL HIGH"
## [48] "38. THIS PICTURE          NAKED RAIN"
## [49] "39. SHAMEN                MOVE MOUNTAINS"
## [50] "40. RATCAT                THAT AIN'T BAD"
## [51] "41. KITCHENS OF DISTINCTION DRIVE ..."
## [52] "42. STING                 ALL THIS TIME"
## [53] "43. CANDY FLIP            RED HILLS ROAD"
## [54] "44. THE PIXIES            LETTER TO MEMPHIS"
## [55] "45. JUDYBATS              NATIVE SON"
## [56] "46. THE OCEAN BLUE        CERULEAN"
## [57] "47. VOICE FARM            FREE LOVE"
## [58] "48. SIOUXSIE & THE BANSHEES SHADOWTIME"
## [59] "49. SEAL                  CRAZY"

```

## [60]	"50. RIGHT SAID FRED	I'M TOO SEXY"	
## [61]	"51. MORRISSEY	SING YOUR LIFE"	
## [62]	"52. ERASURE	LOVE TO HATE YOU"	
## [63]	"53. MANIC ST. PREACHERS	STAY BEAUTIFUL"	
## [64]	"54 and 55 are missing on the list I have. Does anybody know what they"		
## [65]	"are?"		
## [66]	"56. SISTERS OF MERCY	DETONATION"	
## [67]	"57. KIRSTY MACCOLL	WALKING DOWN MADISON"	
## [68]	"58. THE PRIMITIVES	THE WAY YOU ARE"	
## [69]	"59. TEENAGE FANCLUB	STAR SIGN"	
## [70]	"60. THE FARM	ALL TOGETHER NOW"	
## [71]	"61. THE DYLANs	PLANET LOVE"	
## [72]	"62. TOO MUCH JOY	CRUSH STORY"	
## [73]	"63. MINISTRY	JESUS BUILT MY HOTROD"	
## [74]	"64. PRIMAL SCREAM	MOVIN' ON UP"	
## [75]	"65. WIR	SO AND SLOW IT GROWS"	
## [76]	"66. THE MISSION U.K.	HANDS ACROSS ..."	
## [77]	"67. INTERNATIONAL BEAT	ROCK STEADY"	
## [78]	"68. SQUEEZE	SATISFIED"	
## [79]	"69. NITZER EBB	FAMILY MAN"	
## [80]	"70. I START COUNTING	STILL SMILING"	
## [81]	"71. VIOLENT FEMMES	AMERICAN MUSIC"	
## [82]	"72. THE MILLTOWN BROTHERS	WHICH WAY ..."	
## [83]	"73. HAPPY MONDAYS	BOB'S YER UNCLE"	
## [84]	"74. CAMOUFLAGE	HEAVEN I WANT YOU"	
## [85]	"75. MOCK TURTLES	CAN YOU DIG IT?"	
## [86]	"76. CROWDED HOUSE	IT'S ONLY NATURAL"	
## [87]	"77. POPINJAYS	VOTE ELVIS"	
## [88]	"78. CARTER U.S.M.	THIS IS HOW ..."	
## [89]	"79. THE LA'S	I CAN'T SLEEP"	
## [90]	"80. ST. ETIENNE	ONLY LOVE CAN BREAK YOUR HEART"	
## [91]	"81. ENYA	CARRIBEAN BLUE"	
## [92]	"82. PRESENCE	IN WONDER"	
## [93]	"83. PET SHOP BOYS	WHERE THE STREETS HAVE NO NAME	(tie)"
## [94]	"83. SPIREA-X	SPEED REACTION	(tie)"
## [95]	"84. THE WENDY'S	HALFPIE"	
## [96]	"85. KATE BUSH	ROCKET MAN"	
## [97]	"86. CANDY SKINS	SHE BLEW ME AWAY"	
## [98]	"87. ORB	PERPETUAL DAWN"	
## [99]	"88. BIRDLAND	SHOOT YOU DOWN"	
## [100]	"89. TIN MACHINE	BABY UNIVERSAL"	
## [101]	"90. SINGLE GUN THEORY	FROM A MILLION"	
## [102]	"91. NED'S ATOMIC DUSTBIN	GREY CELL GREEN	(tie)"
## [103]	"91. XYMOX	PHOENIX OF MY HEART	(tie)"
## [104]	"92. LUSH	DE-LUXE	"
## [105]	"93. SCATTERBRAIN	DOWN WITH THE SHIP"	
## [106]	"94. EON	SPICE"	
## [107]	"95. SMITHEREENS	TOP OF THE POPS"	
## [108]	"96. G. W. McLENNAN	EASY COME, EASY GO"	
## [109]	"97. KLF	LAST TRAIN TO TRANSCENTRAL	(tie)"
## [110]	"97. HOODOO GURUS	MISS FREELOVE '69	(tie)"
## [111]	"98. ANTHRAX	BRING THE NOISE "	
## [112]	"99. MARY'S DANISH	JULIE'S BLANKET"	
## [113]	"100. MEAT PUPPETS	SAM"	

```
## [114] "101. SMASHING PUMPKINS      SIVA"
## [115] "102. ELVIS COSTELLO        OTHER SIDE OF ..."
## [116] "103. SEERS                  PSYCHE OUT"
## [117] "104. THRILL KILL CULT      SEX ON WHEELZ"
## [118] "105. MATTHEW SWEET         I'VE BEEN WAITING"
## [119] "105.3 LATOUR               PEOPLE ARE STILL HAVING SEX"
## [120] ""
## [121] "Ed"
## [122] "ed@wente.llnl.gov"
## [123] ""
```

```
X = top105[-c(64, 65)]
Y = str_extract(X, "\\d+\\.\\.\\.\\d*")
Z = Y[!is.na(Y)]
x2 <- Z[!Z %in% 1:12]
K = strsplit(x2, " ")[-c(1)]
print(paste(K))
```

```
## [1] "1." "2." "3." "4." "5." "6." "7." "8." "9."
## [10] "10." "11." "12." "13." "14." "15." "16." "17." "18."
## [19] "19." "20." "21." "22." "23." "24." "25." "26." "27."
## [28] "28." "29." "30." "31." "32." "33." "34." "35." "36."
## [37] "37." "38." "39." "40." "41." "42." "43." "44." "45."
## [46] "46." "47." "48." "49." "50." "51." "52." "53." "56."
## [55] "57." "58." "59." "60." "61." "62." "63." "64." "65."
## [64] "66." "67." "68." "69." "70." "71." "72." "73." "74."
## [73] "75." "76." "77." "78." "79." "80." "81." "82." "83."
## [82] "83." "84." "85." "86." "87." "88." "89." "90." "91."
## [91] "91." "92." "93." "94." "95." "96." "97." "97." "98."
## [100] "99." "100." "101." "102." "103." "104." "105." "105.3"
```

## Question5

```
library(stringr)
top105 = readLines("http://www.textfiles.com/music/ktop100.txt")
X = top105[-c(64, 65)]
Y = str_extract(X, "\\d+\\.\\.\\.\\d*")
Z = Y[!is.na(Y)]
x2 <- Z[!Z %in% 1:12]
K = strsplit(x2, " ")[-c(1)]
print(paste(K))
```

```
## [1] "1." "2." "3." "4." "5." "6." "7." "8." "9."
## [10] "10." "11." "12." "13." "14." "15." "16." "17." "18."
## [19] "19." "20." "21." "22." "23." "24." "25." "26." "27."
## [28] "28." "29." "30." "31." "32." "33." "34." "35." "36."
## [37] "37." "38." "39." "40." "41." "42." "43." "44." "45."
## [46] "46." "47." "48." "49." "50." "51." "52." "53." "56."
## [55] "57." "58." "59." "60." "61." "62." "63." "64." "65."
## [64] "66." "67." "68." "69." "70." "71." "72." "73." "74."
## [73] "75." "76." "77." "78." "79." "80." "81." "82." "83."
```

```
## [82] "83." "84." "85." "86." "87." "88." "89." "90." "91."
## [91] "91." "92." "93." "94." "95." "96." "97." "97." "98."
## [100] "99." "100." "101." "102." "103." "104." "105." "105.3"
```

```
M = gsub('^\\.|\\.$', '', K)
M
```

```
## [1] "1" "2" "3" "4" "5" "6" "7" "8" "9"
## [10] "10" "11" "12" "13" "14" "15" "16" "17" "18"
## [19] "19" "20" "21" "22" "23" "24" "25" "26" "27"
## [28] "28" "29" "30" "31" "32" "33" "34" "35" "36"
## [37] "37" "38" "39" "40" "41" "42" "43" "44" "45"
## [46] "46" "47" "48" "49" "50" "51" "52" "53" "56"
## [55] "57" "58" "59" "60" "61" "62" "63" "64" "65"
## [64] "66" "67" "68" "69" "70" "71" "72" "73" "74"
## [73] "75" "76" "77" "78" "79" "80" "81" "82" "83"
## [82] "83" "84" "85" "86" "87" "88" "89" "90" "91"
## [91] "91" "92" "93" "94" "95" "96" "97" "97" "98"
## [100] "99" "100" "101" "102" "103" "104" "105" "105.3"
```

```
numvec = as.numeric(M)
numvec
```

```
## [1] 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0
## [13] 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0 21.0 22.0 23.0 24.0
## [25] 25.0 26.0 27.0 28.0 29.0 30.0 31.0 32.0 33.0 34.0 35.0 36.0
## [37] 37.0 38.0 39.0 40.0 41.0 42.0 43.0 44.0 45.0 46.0 47.0 48.0
## [49] 49.0 50.0 51.0 52.0 53.0 56.0 57.0 58.0 59.0 60.0 61.0 62.0
## [61] 63.0 64.0 65.0 66.0 67.0 68.0 69.0 70.0 71.0 72.0 73.0 74.0
## [73] 75.0 76.0 77.0 78.0 79.0 80.0 81.0 82.0 83.0 83.0 84.0 85.0
## [85] 86.0 87.0 88.0 89.0 90.0 91.0 91.0 92.0 93.0 94.0 95.0 96.0
## [97] 97.0 97.0 98.0 99.0 100.0 101.0 102.0 103.0 104.0 105.0 105.3
```

```
is.numeric(numvec)
```

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

```
D = numvec[duplicated(numvec)]
print(D)
```

```
## [1] 83 91 97
```

```
##THE END
```