PR_2_Rymchuk

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1. Створіть вектор v із 100 елементів командою v <- rnorm(100). Для цього вектору виведіть: 10-й елемент; елементи з 10-го по 20-й включно; 10 елементів починаючи з 20-го; елементи більше 0.

```
v <- rnorm(100)
cat('Create vector with 100 elements\n')
```

```
## Create vector with 100 elements
```

```
print(v)
```

```
##   [1]  1.72772573 -0.11730393 -0.89588315  0.33471191 -0.24889109  0.33506072
##   [7]  0.28310256  0.44167964  0.50525544 -1.39299569 -0.53441011 -0.84360409
##  [13] -1.96525635 -0.41853141 -0.73721740  1.70531314  0.48771849  0.40580851
##  [19] -0.04600026 -1.82525041 -0.39849375  0.48403989 -0.37307035  2.52704490
##  [25] -0.14042802 -1.16729307  0.04728133  0.25184338  1.17959262  0.76535954
##  [31]  0.67484242 -2.83530087  0.03452798 -2.23641991 -0.67729125  0.57714558
##  [37]  2.15116009  0.36956269 -1.37005384  0.16343906  0.80580050 -1.01491864
##  [43] -0.36501495  1.21222610 -0.47230844 -0.78867695 -2.12752738 -1.08837513
##  [49] -0.21758768 -1.73601237 -0.46455536 -1.24013104 -1.07552034  1.18998892
##  [55] -0.22766822 -0.17277152  0.48516152 -1.48242948  0.05080237  0.34702895
##  [61] -0.79200949  1.80911942 -0.50753159 -0.19182949  0.52781720  0.38234897
##  [67]  0.21741702 -1.34400810 -0.77544378 -0.09555174  1.67123659  0.22468166
##  [73] -0.68464610 -1.09480490 -0.49642914 -2.01989039 -0.88056868  0.20154477
##  [79] -0.65685351  0.98330755  0.17672843 -0.83045957  0.19975577  0.21410394
##  [85] -1.82266541  0.70380677  0.37584532  0.60575152 -0.68060786 -0.30015286
##  [91]  0.66145457  0.98885679 -0.16521679 -0.92522245 -0.47481454  0.81118550
##  [97] -0.28547525  0.64954402  0.20686360 -0.89034138
```

```
cat('Print element with index 10 \n')
```

```
## Print element with index 10
```

```
print(v[10])
```

```
## [1] -1.392996
```

```
cat('Print elements with index between 10 and 20\n')
```

```
## Print elements with index between 10 and 20
```

```
print(v[10:20])
```

```
##  [1] -1.39299569 -0.53441011 -0.84360409 -1.96525635 -0.41853141 -0.73721740
##  [7]  1.70531314  0.48771849  0.40580851 -0.04600026 -1.82525041
```

```
cat('Print 10 elements with start from index 20\n')
```

```
## Print 10 elements with start from index 20
```

```
print(v[20:30])
```

```
##  [1] -1.82525041 -0.39849375  0.48403989 -0.37307035  2.52704490 -0.14042802
##  [7] -1.16729307  0.04728133  0.25184338  1.17959262  0.76535954
```

```
cat('Print elements > 0\n')
```

```
## Print elements > 0
```

```
print(v[v>0])
```

```
##  [1] 1.72772573 0.33471191 0.33506072 0.28310256 0.44167964 0.50525544
##  [7] 1.70531314 0.48771849 0.40580851 0.48403989 2.52704490 0.04728133
## [13] 0.25184338 1.17959262 0.76535954 0.67484242 0.03452798 0.57714558
## [19] 2.15116009 0.36956269 0.16343906 0.80580050 1.21222610 1.18998892
## [25] 0.48516152 0.05080237 0.34702895 1.80911942 0.52781720 0.38234897
## [31] 0.21741702 1.67123659 0.22468166 0.20154477 0.98330755 0.17672843
## [37] 0.19975577 0.21410394 0.70380677 0.37584532 0.60575152 0.66145457
## [43] 0.98885679 0.81118550 0.64954402 0.20686360
```

2. Створити фрейм (data frame) у командою y <- data.frame(a = rnorm(100), b = 1:100, cc = sample(letters, 100, replace = TRUE)). Для цього data frame виведіть: останні 10 строк; строки з 10 по 20 включно; 10-й елемент стовпця b; повністю стовпець cc, при цьому використайте ім’я стовпця.

```
my_dataFrame <- data.frame(a = rnorm(100), b= 1:100, cc = sample(letters, 100, replace = TRUE))
my_dataFrame
```

```
##             a   b cc
## 1  -2.50852365   1  i
## 2   0.48159891   2  h
## 3   1.50608487   3  h
## 4   0.67129032   4  m
## 5   1.49098443   5  o
## 6   1.23308778   6  w
## 7   0.14644226   7  g
## 8  -1.46657349   8  g
## 9   0.47795260   9  e
## 10  0.29714756  10  c
## 11 -0.45684302  11  u
## 12  0.19900075  12  c
## 13 -0.69230449  13  u
## 14  1.03766809  14  u
## 15  1.91988768  15  e
## 16  1.96949065  16  w
## 17 -0.25504804  17  h
## 18 -0.65005202  18  q
## 19 -3.32938918  19  g
## 20 -0.16618608  20  p
## 21  0.44714552  21  y
## 22 -0.04372076  22  g
## 23  1.10794023  23  c
## 24  0.72408023  24  d
## 25  0.33061390  25  e
## 26 -0.22876401  26  n
## 27  0.82046420  27  w
## 28 -1.05486942  28  p
## 29  1.07632819  29  c
## 30  0.23702262  30  y
## 31  0.14373067  31  n
## 32  0.35947694  32  q
## 33 -0.70876723  33  z
## 34  0.24442865  34  c
## 35 -1.12494725  35  i
## 36 -0.39501661  36  z
## 37 -0.51461040  37  v
## 38  1.64807862  38  e
## 39  0.64104259  39  y
## 40 -0.88291066  40  g
## 41 -0.66922269  41  i
## 42  1.24221211  42  r
```

```
## 43   1.94960791  43  u
## 44   0.87765158  44  b
## 45  -0.50032351  45  p
## 46  -1.04437476  46  o
## 47  -0.93990119  47  v
## 48   0.68894497  48  v
## 49  -0.62201442  49  q
## 50  -1.26172785  50  a
## 51  -0.32783721  51  e
## 52  -0.59455814  52  d
## 53  -3.74614246  53  c
## 54   1.78436149  54  b
## 55   0.17117975  55  u
## 56   1.27779357  56  m
## 57   0.56206662  57  k
## 58  -0.70740613  58  c
## 59   1.11849834  59  j
## 60  -1.29367164  60  b
## 61   2.51579922  61  o
## 62   1.12153137  62  e
## 63   0.20168899  63  a
## 64  -0.10182907  64  z
## 65  -0.27778035  65  e
## 66   0.17357765  66  s
## 67  -1.58313972  67  i
## 68  -1.28251431  68  c
## 69   0.29717521  69  v
## 70   0.76198485  70  r
## 71   2.31645203  71  k
## 72  -2.36893503  72  h
## 73   1.63994105  73  l
## 74   0.22568646  74  f
## 75   0.62244446  75  l
## 76  -0.08051335  76  k
## 77   0.68747015  77  y
## 78  -1.58133619  78  d
## 79  -0.74895962  79  x
## 80  -2.46273469  80  e
## 81   1.08845011  81  k
## 82  -1.00076288  82  x
## 83  -0.64509803  83  m
## 84  -0.89882499  84  l
## 85   1.21094721  85  h
## 86   0.68329249  86  n
## 87   1.26000695  87  p
## 88   0.86085701  88  n
## 89  -0.06921798  89  v
## 90  -1.44456057  90  e
## 91   0.66339387  91  n
## 92   0.45109830  92  d
## 93   2.28061890  93  t
## 94  -1.21998903  94  n
## 95   0.05540819  95  m
## 96  -1.07224543  96  i
## 97  -0.85486866  97  r
## 98  -0.86736798  98  i
## 99   0.59077903  99  g
## 100  0.39884934 100  p
```

```
print(tail(my_dataFrame, n = 10))
```

```
##              a   b cc
## 91   0.66339387  91  n
## 92   0.45109830  92  d
## 93   2.28061890  93  t
## 94  -1.21998903  94  n
## 95   0.05540819  95  m
## 96  -1.07224543  96  i
## 97  -0.85486866  97  r
## 98  -0.86736798  98  i
## 99   0.59077903  99  g
## 100  0.39884934 100  p
```

```
print(my_dataFrame[10:20,])
```

```
##            a  b cc
## 10  0.2971476 10  c
## 11 -0.4568430 11  u
## 12  0.1990007 12  c
## 13 -0.6923045 13  u
## 14  1.0376681 14  u
## 15  1.9198877 15  e
## 16  1.9694906 16  w
## 17 -0.2550480 17  h
## 18 -0.6500520 18  q
## 19 -3.3293892 19  g
## 20 -0.1661861 20  p
```

```
print(my_dataFrame[10,2])
```

```
## [1] 10
```

```
print(my_dataFrame$cc)
```

```
##   [1] "i" "h" "h" "m" "o" "w" "g" "g" "e" "c" "u" "c" "u" "u" "e" "w" "h" "q"
##  [19] "g" "p" "y" "g" "c" "d" "e" "n" "w" "p" "c" "y" "n" "q" "z" "c" "i" "z"
##  [37] "v" "e" "y" "g" "i" "r" "u" "b" "p" "o" "v" "v" "q" "a" "e" "d" "c" "b"
##  [55] "u" "m" "k" "c" "j" "b" "o" "e" "a" "z" "e" "s" "i" "c" "v" "r" "k" "h"
##  [73] "l" "f" "l" "k" "y" "d" "x" "e" "k" "x" "m" "l" "h" "n" "p" "n" "v" "e"
##  [91] "n" "d" "t" "n" "m" "i" "r" "i" "g" "p"
```

3 Створити вектор z з елементами 1, 2, 3, NA, 4, NA, 5, NA. Для цього вектору: виведіть всі елементи, які не NA; підрахуйте середнє значення всіх елементів цього вектору без NA значень та з NA значеннями

```
my_vector <- c(1, 2, 3, NA, 4, NA, 5, NA)

which(my_vector != is.na(my_vector))
```

```
## [1] 1 2 3 5 7
```

```
mean(my_vector, na.rm = TRUE)
```

```
## [1] 3
```

```
mean(my_vector, na.rm = FALSE)
```

```
## [1] NA
```