

2282437_Practical1.R

r1549136

2022-07-24

```
#1)

x=c(seq(1,10,0.01))

# a)
x[2]

## [1] 1.01
x[14]

## [1] 1.13
x[18]

## [1] 1.17

# b)
x[x<5]

## [1] 1.00 1.01 1.02 1.03 1.04 1.05 1.06 1.07 1.08 1.09 1.10 1.11 1.12 1.13 1.14
## [16] 1.15 1.16 1.17 1.18 1.19 1.20 1.21 1.22 1.23 1.24 1.25 1.26 1.27 1.28 1.29
## [31] 1.30 1.31 1.32 1.33 1.34 1.35 1.36 1.37 1.38 1.39 1.40 1.41 1.42 1.43 1.44
## [46] 1.45 1.46 1.47 1.48 1.49 1.50 1.51 1.52 1.53 1.54 1.55 1.56 1.57 1.58 1.59
## [61] 1.60 1.61 1.62 1.63 1.64 1.65 1.66 1.67 1.68 1.69 1.70 1.71 1.72 1.73 1.74
## [76] 1.75 1.76 1.77 1.78 1.79 1.80 1.81 1.82 1.83 1.84 1.85 1.86 1.87 1.88 1.89
## [91] 1.90 1.91 1.92 1.93 1.94 1.95 1.96 1.97 1.98 1.99 2.00 2.01 2.02 2.03 2.04
## [106] 2.05 2.06 2.07 2.08 2.09 2.10 2.11 2.12 2.13 2.14 2.15 2.16 2.17 2.18 2.19
## [121] 2.20 2.21 2.22 2.23 2.24 2.25 2.26 2.27 2.28 2.29 2.30 2.31 2.32 2.33 2.34
## [136] 2.35 2.36 2.37 2.38 2.39 2.40 2.41 2.42 2.43 2.44 2.45 2.46 2.47 2.48 2.49
## [151] 2.50 2.51 2.52 2.53 2.54 2.55 2.56 2.57 2.58 2.59 2.60 2.61 2.62 2.63 2.64
## [166] 2.65 2.66 2.67 2.68 2.69 2.70 2.71 2.72 2.73 2.74 2.75 2.76 2.77 2.78 2.79
## [181] 2.80 2.81 2.82 2.83 2.84 2.85 2.86 2.87 2.88 2.89 2.90 2.91 2.92 2.93 2.94
## [196] 2.95 2.96 2.97 2.98 2.99 3.00 3.01 3.02 3.03 3.04 3.05 3.06 3.07 3.08 3.09
## [211] 3.10 3.11 3.12 3.13 3.14 3.15 3.16 3.17 3.18 3.19 3.20 3.21 3.22 3.23 3.24
## [226] 3.25 3.26 3.27 3.28 3.29 3.30 3.31 3.32 3.33 3.34 3.35 3.36 3.37 3.38 3.39
## [241] 3.40 3.41 3.42 3.43 3.44 3.45 3.46 3.47 3.48 3.49 3.50 3.51 3.52 3.53 3.54
## [256] 3.55 3.56 3.57 3.58 3.59 3.60 3.61 3.62 3.63 3.64 3.65 3.66 3.67 3.68 3.69
## [271] 3.70 3.71 3.72 3.73 3.74 3.75 3.76 3.77 3.78 3.79 3.80 3.81 3.82 3.83 3.84
## [286] 3.85 3.86 3.87 3.88 3.89 3.90 3.91 3.92 3.93 3.94 3.95 3.96 3.97 3.98 3.99
## [301] 4.00 4.01 4.02 4.03 4.04 4.05 4.06 4.07 4.08 4.09 4.10 4.11 4.12 4.13 4.14
## [316] 4.15 4.16 4.17 4.18 4.19 4.20 4.21 4.22 4.23 4.24 4.25 4.26 4.27 4.28 4.29
## [331] 4.30 4.31 4.32 4.33 4.34 4.35 4.36 4.37 4.38 4.39 4.40 4.41 4.42 4.43 4.44
## [346] 4.45 4.46 4.47 4.48 4.49 4.50 4.51 4.52 4.53 4.54 4.55 4.56 4.57 4.58 4.59
```

```
## [361] 4.60 4.61 4.62 4.63 4.64 4.65 4.66 4.67 4.68 4.69 4.70 4.71 4.72 4.73 4.74
## [376] 4.75 4.76 4.77 4.78 4.79 4.80 4.81 4.82 4.83 4.84 4.85 4.86 4.87 4.88 4.89
## [391] 4.90 4.91 4.92 4.93 4.94 4.95 4.96 4.97 4.98 4.99
```

```
# c)
x[x>7]
```

```
## [1] 7.01 7.02 7.03 7.04 7.05 7.06 7.07 7.08 7.09 7.10 7.11 7.12
## [13] 7.13 7.14 7.15 7.16 7.17 7.18 7.19 7.20 7.21 7.22 7.23 7.24
## [25] 7.25 7.26 7.27 7.28 7.29 7.30 7.31 7.32 7.33 7.34 7.35 7.36
## [37] 7.37 7.38 7.39 7.40 7.41 7.42 7.43 7.44 7.45 7.46 7.47 7.48
## [49] 7.49 7.50 7.51 7.52 7.53 7.54 7.55 7.56 7.57 7.58 7.59 7.60
## [61] 7.61 7.62 7.63 7.64 7.65 7.66 7.67 7.68 7.69 7.70 7.71 7.72
## [73] 7.73 7.74 7.75 7.76 7.77 7.78 7.79 7.80 7.81 7.82 7.83 7.84
## [85] 7.85 7.86 7.87 7.88 7.89 7.90 7.91 7.92 7.93 7.94 7.95 7.96
## [97] 7.97 7.98 7.99 8.00 8.01 8.02 8.03 8.04 8.05 8.06 8.07 8.08
## [109] 8.09 8.10 8.11 8.12 8.13 8.14 8.15 8.16 8.17 8.18 8.19 8.20
## [121] 8.21 8.22 8.23 8.24 8.25 8.26 8.27 8.28 8.29 8.30 8.31 8.32
## [133] 8.33 8.34 8.35 8.36 8.37 8.38 8.39 8.40 8.41 8.42 8.43 8.44
## [145] 8.45 8.46 8.47 8.48 8.49 8.50 8.51 8.52 8.53 8.54 8.55 8.56
## [157] 8.57 8.58 8.59 8.60 8.61 8.62 8.63 8.64 8.65 8.66 8.67 8.68
## [169] 8.69 8.70 8.71 8.72 8.73 8.74 8.75 8.76 8.77 8.78 8.79 8.80
## [181] 8.81 8.82 8.83 8.84 8.85 8.86 8.87 8.88 8.89 8.90 8.91 8.92
## [193] 8.93 8.94 8.95 8.96 8.97 8.98 8.99 9.00 9.01 9.02 9.03 9.04
## [205] 9.05 9.06 9.07 9.08 9.09 9.10 9.11 9.12 9.13 9.14 9.15 9.16
## [217] 9.17 9.18 9.19 9.20 9.21 9.22 9.23 9.24 9.25 9.26 9.27 9.28
## [229] 9.29 9.30 9.31 9.32 9.33 9.34 9.35 9.36 9.37 9.38 9.39 9.40
## [241] 9.41 9.42 9.43 9.44 9.45 9.46 9.47 9.48 9.49 9.50 9.51 9.52
## [253] 9.53 9.54 9.55 9.56 9.57 9.58 9.59 9.60 9.61 9.62 9.63 9.64
## [265] 9.65 9.66 9.67 9.68 9.69 9.70 9.71 9.72 9.73 9.74 9.75 9.76
## [277] 9.77 9.78 9.79 9.80 9.81 9.82 9.83 9.84 9.85 9.86 9.87 9.88
## [289] 9.89 9.90 9.91 9.92 9.93 9.94 9.95 9.96 9.97 9.98 9.99 10.00
```

```
# d)
x[x>6&x<8]
```

```
## [1] 6.01 6.02 6.03 6.04 6.05 6.06 6.07 6.08 6.09 6.10 6.11 6.12 6.13 6.14 6.15
## [16] 6.16 6.17 6.18 6.19 6.20 6.21 6.22 6.23 6.24 6.25 6.26 6.27 6.28 6.29 6.30
## [31] 6.31 6.32 6.33 6.34 6.35 6.36 6.37 6.38 6.39 6.40 6.41 6.42 6.43 6.44 6.45
## [46] 6.46 6.47 6.48 6.49 6.50 6.51 6.52 6.53 6.54 6.55 6.56 6.57 6.58 6.59 6.60
## [61] 6.61 6.62 6.63 6.64 6.65 6.66 6.67 6.68 6.69 6.70 6.71 6.72 6.73 6.74 6.75
## [76] 6.76 6.77 6.78 6.79 6.80 6.81 6.82 6.83 6.84 6.85 6.86 6.87 6.88 6.89 6.90
## [91] 6.91 6.92 6.93 6.94 6.95 6.96 6.97 6.98 6.99 7.00 7.01 7.02 7.03 7.04 7.05
## [106] 7.06 7.07 7.08 7.09 7.10 7.11 7.12 7.13 7.14 7.15 7.16 7.17 7.18 7.19 7.20
## [121] 7.21 7.22 7.23 7.24 7.25 7.26 7.27 7.28 7.29 7.30 7.31 7.32 7.33 7.34 7.35
## [136] 7.36 7.37 7.38 7.39 7.40 7.41 7.42 7.43 7.44 7.45 7.46 7.47 7.48 7.49 7.50
## [151] 7.51 7.52 7.53 7.54 7.55 7.56 7.57 7.58 7.59 7.60 7.61 7.62 7.63 7.64 7.65
## [166] 7.66 7.67 7.68 7.69 7.70 7.71 7.72 7.73 7.74 7.75 7.76 7.77 7.78 7.79 7.80
## [181] 7.81 7.82 7.83 7.84 7.85 7.86 7.87 7.88 7.89 7.90 7.91 7.92 7.93 7.94 7.95
## [196] 7.96 7.97 7.98 7.99
```

```
#2nd
matrix=matrix(c(2,-3,10,2,4,23,-7,9,0),nrow=3,ncol=3,byrow=TRUE)
matrix
```

```
## [,1] [,2] [,3]
## [1,] 2 -3 10
```

```
## [2,] 2 4 23
## [3,] -7 9 0
```

```
rownames(matrix)=c('r1','r2','r3')
matrix
```

```
##      [,1] [,2] [,3]
## r1      2  -3  10
## r2      2   4  23
## r3     -7   9   0
```

```
colnames(matrix)=c("1","2","3")
matrix
```

```
##      1 2 3
## r1  2 -3 10
## r2  2 4 23
## r3 -7 9 0
```

#3rd

```
A=matrix(c(1,3,5,2,4,6),nrow=2,ncol=3,byrow=TRUE)
A
```

```
##      [,1] [,2] [,3]
## [1,] 1 3 5
## [2,] 2 4 6
```

```
B=matrix(c(3,2,1,4,5,6),nrow=3,ncol=2,byrow=FALSE)
B
```

```
##      [,1] [,2]
## [1,] 3 4
## [2,] 2 5
## [3,] 1 6
```

#a)

```
A[,3]
```

```
## [1] 5 6
```

```
B[1,]
```

```
## [1] 3 4
```

```
B[1,2]
```

```
## [1] 4
```

#b)

```
sum1=A+t(B)
sum1
```

```
##      [,1] [,2] [,3]
## [1,] 4 5 6
## [2,] 6 9 12
```

```
sum2=t(A)+B
sum2
```

```
##      [,1] [,2]
## [1,] 4 6
## [2,] 5 9
```

```
## [3,]    6   12
sum3=3*A
sum3

##      [,1] [,2] [,3]
## [1,]    3    9   15
## [2,]    6   12   18

#c)
C=t(A)
C

##      [,1] [,2]
## [1,]    1    2
## [2,]    3    4
## [3,]    5    6

D=t(B)
D

##      [,1] [,2] [,3]
## [1,]    3    2    1
## [2,]    4    5    6

mul1=A%*%B
mul1

##      [,1] [,2]
## [1,]   14   49
## [2,]   20   64

mul2=C%*%A
mul2

##      [,1] [,2] [,3]
## [1,]    5   11   17
## [2,]   11   25   39
## [3,]   17   39   61

mul3=D%*%B
mul3

##      [,1] [,2]
## [1,]   14   28
## [2,]   28   77

#4th

employee= data.frame(

  Employee = c("Rick","Dan","Michelle","Ryan","Gary"),
  salary = c(623.3,515.2,611.0,729.0,843.25),
  Joining =c("2012", "2013", "2014", "2014","2015")

)

#a)
employee[nrow(employee) + 1,] = c("Rashmi", 578, 2013)
employee
```

```
## Employee salary Joining
## 1 Rick 623.3 2012
## 2 Dan 515.2 2013
## 3 Michelle 611 2014
## 4 Ryan 729 2014
## 5 Gary 843.25 2015
## 6 Rashmi 578 2013
```

```
#b)
employee$department = c("IT","Operations","IT","HR","Finance","IT")
employee
```

```
## Employee salary Joining department
## 1 Rick 623.3 2012 IT
## 2 Dan 515.2 2013 Operations
## 3 Michelle 611 2014 IT
## 4 Ryan 729 2014 HR
## 5 Gary 843.25 2015 Finance
## 6 Rashmi 578 2013 IT
```

```
#c)
employee[c(1,4),c(1:4)]
```

```
## Employee salary Joining department
## 1 Rick 623.3 2012 IT
## 4 Ryan 729 2014 HR
```

```
#5)
vectr=c(1,2,3,4)
vectr
```

```
## [1] 1 2 3 4
matrx=matrix(c(1,3,5,2),nrow=2,ncol=2,byrow=TRUE)
matrx
```

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

```
v1=c(1,2,3,4)
v2=c(7,8)
aray=array(c(v1,v2),dim = c(3,3))
aray
```

```
## [,1] [,2] [,3]
## [1,] 1 4 1
## [2,] 2 7 2
## [3,] 3 8 3
```

```
employee= data.frame(
  Employee = c("Rick","Dan","Michelle","Ryan","Gary"),
  salary = c(623.3,515.2,611.0,729.0,843.25),
  Joining =c("2012", "2013", "2014", "2014","2015")
)
employee
```

```
## Employee salary Joining
## 1 Rick 623.30 2012
## 2 Dan 515.20 2013
## 3 Michelle 611.00 2014
## 4 Ryan 729.00 2014
## 5 Gary 843.25 2015
```

```
lst=list(vectr,matrx,array,employee)
lst
```

```
## [[1]]
## [1] 1 2 3 4
##
## [[2]]
## [,1] [,2]
## [1,] 1 3
## [2,] 5 2
##
## [[3]]
## [,1] [,2] [,3]
## [1,] 1 4 1
## [2,] 2 7 2
## [3,] 3 8 3
##
## [[4]]
## Employee salary Joining
## 1 Rick 623.30 2012
## 2 Dan 515.20 2013
## 3 Michelle 611.00 2014
## 4 Ryan 729.00 2014
## 5 Gary 843.25 2015
```