4_RObjects

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introducing R objects

vectors

hold values of same class and declared using vector () and c()

```
v1 <- c(1,2,3,4,5,6,7,8,9,10)

v1
```

```
##  [1]  1  2  3  4  5  6  7  8  9 10
```

```
class(v1)
```

```
## [1] "numeric"
```

```
v2 <- c("hitesh","gajuji","solanki")

v2
```

```
## [1] "hitesh"  "gajuji"  "solanki"
```

```
class(v2)
```

```
## [1] "character"
```

```
v3 <- c(T,F)

v3
```

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

```
class(v3)
```

```
## [1] "logical"
```

```
### how to create vactor using vactor ()

v4 <- vector("numeric", length = 20)

v4
```

```
##  [1] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
```

```
class(v4)
```

```
## [1] "numeric"
```

```
length(v4)
```

```
## [1] 20
```

```
### concatinating vector meaning mixing two vector of diffrent class and auto assigning mutual class

v5 <- c("hitesh" , "gajuji")

v6 <- c(1,2)

v7 <- c(v5,v6)

v7
```

```
## [1] "hitesh" "gajuji" "1"      "2"
```

```
class(v7)
```

```
## [1] "character"
```

```
v8 <- c(T,F)

class(v8)
```

```
## [1] "logical"
```

```
v9 <- c("True", "False")

class(v9)
```

```
## [1] "character"
```

```
v10 <- c(v8,v9)

v10
```

```
## [1] "TRUE"  "FALSE" "True"  "False"
```

```
class(v10)
```

```
## [1] "character"
```

```
### how to print ABCD

v11 <- letters[1:26]

v11
```

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

```
### how to do external cohersion using as.xxx() function

v12 <- 1:10

v12
```

```
##  [1]  1  2  3  4  5  6  7  8  9 10
```

```
class(v12)
```

```
## [1] "integer"
```

```
v13 <-as.numeric(v12)

class(v13)
```

```
## [1] "numeric"
```

```
v14 <- as.character(v12)

class(v14)
```

```
## [1] "character"
```

```
v15 <- as.logical(v12)

v15
```

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

```
class(v15)
```

```
## [1] "logical"
```

```r
v16 <- "hitesh"

v17 <- as.numeric(v16)
```

```
## Warning: NAs introduced by coercion
```

```r
class(v17)
```

```
## [1] "numeric"
```

```r
v17
```

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

```r
### how to get attributes


v18 <- "my name is hitesh"

attributes(v18)
```

```
## NULL
```

list ()

can hold value of multiple class

```r
### while creating list each item is seperate vector

l1 <- list("hitesh", 5 , T)

l1
```

```
## [[1]]
## [1] "hitesh"
##
## [[2]]
## [1] 5
##
## [[3]]
## [1] TRUE
```

```r
class(l1)
```

```
## [1] "list"
```

```r
attributes(l1)
```

```
## NULL
```

```r
### how to assign names to list objects

l2 <- list("names" = c("hitesh","gajuji"), "Age" = c(22,50), "alive"= c(T,T))

l2
```

```
## $names
## [1] "hitesh" "gajuji"
##
## $Age
## [1] 22 50
##
## $alive
## [1] TRUE TRUE
```

```r
class(l2)
```

```
## [1] "list"
```

```r
attributes(l2)
```

```
## $names
## [1] "names" "Age"   "alive"
```

```r
### hoe to check if it is list

class(l2)
```

```
## [1] "list"
```

```r
is.list(l2)
```

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

```r
### how to give name to list after creating list


l3 <- list(c("hitesh","gajuji"),c(22,50), c(T,T))

l3
```

```
## [[1]]
## [1] "hitesh" "gajuji"
##
## [[2]]
## [1] 22 50
##
## [[3]]
## [1] TRUE TRUE
```

```r
names(l3) <- c("name","age","alive")


l3
```

```
## $name
## [1] "hitesh" "gajuji"
##
## $age
## [1] 22 50
##
## $alive
## [1] TRUE TRUE
```

```r
### how to get value from list

l3
```

```
## $name
## [1] "hitesh" "gajuji"
##
## $age
## [1] 22 50
##
## $alive
## [1] TRUE TRUE
```

```r
l3[[1]]
```

```
## [1] "hitesh" "gajuji"
```

```r
l3[[2]]
```

```
## [1] 22 50
```

```r
l3[[3]]
```

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

```r
l3
```

```
## $name
## [1] "hitesh" "gajuji"
##
## $age
## [1] 22 50
##
## $alive
## [1] TRUE TRUE
```

```r
### how to get well output using str

l4 <-str(l3)
```

```
## List of 3
##  $ name : chr [1:2] "hitesh" "gajuji"
##  $ age  : num [1:2] 22 50
##  $ alive: logi [1:2] TRUE TRUE
```

```r
l4
```

```
## NULL
```

```r
### how to get specific output from list

l3[[1]]
```

```
## [1] "hitesh" "gajuji"
```

```r
l3$name[[1]]
```

```
## [1] "hitesh"
```

```r
l3$name[[2]]
```

```
## [1] "gajuji"
```

```r
# using similar function


l4 <- list("name" = "rashmika", "age" = 30, "alive" = T)

l2 <- list("names" = c("hitesh","gajuji"), "Age" = c(22,50), "alive"= c(T,T), similar = l4)

l2
```

```
## $names
## [1] "hitesh" "gajuji"
##
## $Age
## [1] 22 50
##
## $alive
## [1] TRUE TRUE
##
## $similar
## $similar$name
## [1] "rashmika"
##
## $similar$age
```

```
## [1] 30
##
## $similar$alive
## [1] TRUE
```

```
# getting perticulat object from list


l2[[1]]
```

```
## [1] "hitesh" "gajuji"
```

```
l2$names[[1]]
```

```
## [1] "hitesh"
```

```
l2$similar[[1]]
```

```
## [1] "rashmika"
```

```
l2$similar$name[[1]]
```

```
## [1] "rashmika"
```

```
### accessing a list item from name

l2$names
```

```
## [1] "hitesh" "gajuji"
```

```
l2[["names"]]
```

```
## [1] "hitesh" "gajuji"
```

```
l2[["Age"]]
```

```
## [1] 22 50
```

```
### how to use logics to get list

l2
```

```
## $names
## [1] "hitesh" "gajuji"
##
## $Age
## [1] 22 50
##
## $alive
```

```
## [1] TRUE TRUE
##
## $similar
## $similar$name
## [1] "rashmika"
##
## $similar$age
## [1] 30
##
## $similar$alive
## [1] TRUE
```

```
l2[c(T,F,T,F,T,F)]
```

```
## $names
## [1] "hitesh" "gajuji"
##
## $alive
## [1] TRUE TRUE
##
## $<NA>
## NULL
```

```
### how to add vector in list


l2
```

```
## $names
## [1] "hitesh" "gajuji"
##
## $Age
## [1] 22 50
##
## $alive
## [1] TRUE TRUE
##
## $similar
## $similar$name
## [1] "rashmika"
##
## $similar$age
## [1] 30
##
## $similar$alive
## [1] TRUE
```

```
vect <- "kamkhya"

vect2 <- 3

vect3 <- T
```

```
l2 <- list("names" = c("hitesh","gajuji", vect), "Age" = c(22,50, vect2), "alive"= c(T,T,vect3), simila
```

```
l2
```

```
## $names
## [1] "hitesh"  "gajuji"  "kamkhya"
##
## $Age
## [1] 22 50  3
##
## $alive
## [1] TRUE TRUE TRUE
##
## $similar
## $similar$name
## [1] "rashmika"
##
## $similar$age
## [1] 30
##
## $similar$alive
## [1] TRUE
```

Matrix

two dimention holding same class of data

```
m1 <- matrix(1:25,nrow = 5,ncol = 5, byrow = F)

m1
```

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

```
m2 <- matrix(1:25,nrow = 5,ncol = 5, byrow = T)


### how to create matrix using rbind and cbind


rbind(1:5,1:5,1:5)
```

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

```r
m3 <- cbind(1:5,1:5,1:5)


m3
```

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

```r
#creating matrix


mat1 <- matrix(1:100, byrow = T, nrow = 10)


mat1
```

```
##       [,1] [,2] [,3] [,4] [,5] [,6] [,7] [,8] [,9] [,10]
##  [1,]    1    2    3    4    5    6    7    8    9    10
##  [2,]   11   12   13   14   15   16   17   18   19    20
##  [3,]   21   22   23   24   25   26   27   28   29    30
##  [4,]   31   32   33   34   35   36   37   38   39    40
##  [5,]   41   42   43   44   45   46   47   48   49    50
##  [6,]   51   52   53   54   55   56   57   58   59    60
##  [7,]   61   62   63   64   65   66   67   68   69    70
##  [8,]   71   72   73   74   75   76   77   78   79    80
##  [9,]   81   82   83   84   85   86   87   88   89    90
## [10,]   91   92   93   94   95   96   97   98   99   100
```

```r
#how to add values to existing matrix




mat1 <- rbind(mat1,111:120)

mat1
```

```
##       [,1] [,2] [,3] [,4] [,5] [,6] [,7] [,8] [,9] [,10]
##  [1,]    1    2    3    4    5    6    7    8    9    10
##  [2,]   11   12   13   14   15   16   17   18   19    20
##  [3,]   21   22   23   24   25   26   27   28   29    30
##  [4,]   31   32   33   34   35   36   37   38   39    40
##  [5,]   41   42   43   44   45   46   47   48   49    50
##  [6,]   51   52   53   54   55   56   57   58   59    60
##  [7,]   61   62   63   64   65   66   67   68   69    70
##  [8,]   71   72   73   74   75   76   77   78   79    80
##  [9,]   81   82   83   84   85   86   87   88   89    90
## [10,]   91   92   93   94   95   96   97   98   99   100
## [11,]  111  112  113  114  115  116  117  118  119   120
```

```r
xx <- c(121:130,131:140)


mat1 <- rbind(mat1,121:130)

mat1
```

```
##       [,1] [,2] [,3] [,4] [,5] [,6] [,7] [,8] [,9] [,10]
##  [1,]    1    2    3    4    5    6    7    8    9    10
##  [2,]   11   12   13   14   15   16   17   18   19    20
##  [3,]   21   22   23   24   25   26   27   28   29    30
##  [4,]   31   32   33   34   35   36   37   38   39    40
##  [5,]   41   42   43   44   45   46   47   48   49    50
##  [6,]   51   52   53   54   55   56   57   58   59    60
##  [7,]   61   62   63   64   65   66   67   68   69    70
##  [8,]   71   72   73   74   75   76   77   78   79    80
##  [9,]   81   82   83   84   85   86   87   88   89    90
## [10,]   91   92   93   94   95   96   97   98   99   100
## [11,]  111  112  113  114  115  116  117  118  119   120
## [12,]  121  122  123  124  125  126  127  128  129   130
```

```r
### add value by cbind()

mat1 <- cbind(mat1,1:15)
```

```
## Warning in cbind(mat1, 1:15): number of rows of result is not a multiple of
## vector length (arg 2)
```

```r
mat1
```

```
##       [,1] [,2] [,3] [,4] [,5] [,6] [,7] [,8] [,9] [,10] [,11]
##  [1,]    1    2    3    4    5    6    7    8    9    10     1
##  [2,]   11   12   13   14   15   16   17   18   19    20     2
##  [3,]   21   22   23   24   25   26   27   28   29    30     3
##  [4,]   31   32   33   34   35   36   37   38   39    40     4
##  [5,]   41   42   43   44   45   46   47   48   49    50     5
##  [6,]   51   52   53   54   55   56   57   58   59    60     6
##  [7,]   61   62   63   64   65   66   67   68   69    70     7
##  [8,]   71   72   73   74   75   76   77   78   79    80     8
##  [9,]   81   82   83   84   85   86   87   88   89    90     9
## [10,]   91   92   93   94   95   96   97   98   99   100    10
## [11,]  111  112  113  114  115  116  117  118  119   120    11
## [12,]  121  122  123  124  125  126  127  128  129   130    12
```

```r
### how to add name to matrix



n <- matrix(1:4, nrow = 2 , byrow = 2)

n
```

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

```
colnames(n) <- c("one","two")

rownames(n) <- c("A","B")

n
```

```
##   one two
## A   1   2
## B   3   4
```

```
#how to give naes to matrix using dimname()

a <- c("hitesh", "Gajuji")

b <- c(22,50)

c <- cbind(a,b)

c
```

```
##      a         b
## [1,] "hitesh" "22"
## [2,] "Gajuji" "50"
```

```
dimnames(c) <- list(c(1,2),c("Name","age"))

c
```

```
##   Name     age
## 1 "hitesh" "22"
## 2 "Gajuji" "50"
```

```
# how to bind two vectors using rbind cbind


m1 <- matrix(1:6,ncol = 3)

m1
```

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

```
m2 <- matrix(letters[1:6], ncol = 3)

m2
```

```
##      [,1] [,2] [,3]
## [1,] "a"  "c"  "e"
## [2,] "b"  "d"  "f"
```

```
m3 <- rbind(m1,m2)


m3
```

```
##      [,1] [,2] [,3]
## [1,] "1"  "3"  "5"
## [2,] "2"  "4"  "6"
## [3,] "a"  "c"  "e"
## [4,] "b"  "d"  "f"
```

```
m3 <- cbind(m1,m2)

m3
```

```
##      [,1] [,2] [,3] [,4] [,5] [,6]
## [1,] "1"  "3"  "5"  "a"  "c"  "e"
## [2,] "2"  "4"  "6"  "b"  "d"  "f"
```