

List:

These are the most complex data structure. A List may contain a combination of vectors, matrices, data frames and even other list itself. The list is being created using `List()` function in R. A list is a generic vector containing other objects. Lists is a data structure containing of mixed data types. A vector which have all elements of same type is called atomic vector but a vector having elements of various type is called List.

Creating List

```
# Vector with numerics from 1 up to 10
> my_vector <- 1:10

# Matrix with numerics from 1 up to 9
> my_matrix <- matrix(1:9, ncol = 3)

# First 3 rows of the built-in data frame mtcars
> my_df <- mtcars[1:3,]

# Construct list with these different elements:
> my_list <- list(my_vector, my_matrix, my_df)
> my_list # no name as of now

# give name using name ()
> names(my_list) <- c("vec", "mat", "df")

# Print out my_list
> my_list
```

Before creating a list, creating a vector suppose you create a vector with one to ten(1-10).

Thereafter you create a matrix which is two dimensional array.

Then you will create a data frame, that is “mtcars” which was inbuilt data frame but here you just take only three observation and create a data frame called “my-dataframe” from “mtcars”.

Finally, you will store this vector, matrix and dataframe in a list called “my list”, using the `list()` function.

If you created the `list()` then you see the result. You can see the output from “mylist”. Here the list starts from the first vector, “my-vector” is one to ten.

Creating list:

```
# vector with numerics from 1 up to 10
```

```
>my-vector <-1:10
```

The output is

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

Thereafter you create a matrix which is two dimensional array that “my-matrix”.

```
# matrix with numerics from 1 up to 9
```

```
>my-matrix <-matrix(1:9,ncol =3)
```

The output is

[[2]]

	[,1]	[,2]	[,3]
[1,]	1	4	7
[2,]	2	5	8
[3,]	3	6	9

Then you just created the data frame

first 3 rows of the built in data frame "mtcars"

```
>my-df <-mtcars [1:3,]
```

The result is

[[3]]

	mpg	cyl	disp	hp	drat	wt	qsec	vs	am	gear	carb
Mazda RX4	21.0	6	160	110	3.90	2.620	16.46	0	1	4	4
Mazda RX4 Wag	21.0	6	160	110	3.90	2.875	17.02	0	1	4	4
Datsun 710	22.8	4	108	93	3.85	2.320	18.61	1	1	4	1

That's the way to do a list.

If you see these examples there's no name like [1], [2], and [3] is written of the list but you can change those name as well using the name() function.

#give name using name()

```
>names (my list)<-c ("vec", "mat", "df")
```

Then you can check the output and see the name would be changed.

How does a list() work?

At first you create vector() function

```
my-vector<-1:10
```

Then use matrix function

```
my- matrix<-(matrix 1:9, ncol=3)
```

Thereafter creating a dataframe

```
my-df<-mtcars[1:3,]
```

Here"mtcars" is the data where you can see all those 32 car brands and eleven attributes but the first 3 rows uses for this dataframe.

Then using the list() function,created a list

```
my-list <- list(my-vector,my-matrix,my-df)
```

Then the output is my-matrix ,my-vector, and my-df

1.

	[,1]	[,2]	[,3]
[1,]	1	4	7
[2,]	2	5	8
[3,]	3	6	9

2.

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

3.

	mpg	cyl	disp	hp	drat	wt	qsec	vs	am	gear	carb
Mazda RX4	21.0	6	160	110	3.90	2.620	16.46	0	1	4	4
Mazda RX4 wag	21.0	6	160	110	3.90	2.875	17.02	0	1	4	4
Datsun 710	22.8	4	108	93	3.85	2.320	18.61	1	1	4	1

In this way list works.

List is the end of data structure. Any character variables when it goes to data frame it automatically changes to a factor but if you don't want to do this then you can change that things from anything to anything. Here show you how to change anything to a factor using `as.factor` but later you also know where you will be change it to, as `numeric()` function or as `character()` function. You also learn how to change the name of the level.