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Basics of R-project

- ❖ R is a programming language and free software environment for statistical computing and graphics supported by the R Foundation for Statistical Computing.
 - ❖ The R language is widely used among statisticians and data miners for developing statistical software and data analysis.
 - ❖ R was created by Ross Ihaka and Robert Gentleman at the University of Auckland, New Zealand, and is developed by the R Development Core Team. It is based on the S-programming language and named after the first letter of its creators.
 - ❖ Well, R itself is mostly written in C (with hefty chunks in R and Fortran), R packages are mostly written in R (with hefty chunks written in C/C++).
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```
> 6*6  
[1] 36  
> 7/2  
[1] 3.5  
> 1+4  
[1] 5
```

```
> 3-1
[1] 2
> n='12e'
> class(n)
[1] "character"
> n=123
> class(n)
[1] "numeric"
> # Maths Function
> sqrt(5)
[1] 2.236068
> log3(n)
Error in log3(n) : could not find function "log3"
> log2(n)
[1] 6.942515
> log(n)
[1] 4.812184
> abs(-123)
[1] 123
> c(1,2,3,4,5)
[1] 1 2 3 4 5
> class(c)
[1] "function"
> x=seq(from=1, to=10, by=0.5)
> x
[1] 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5
6.0 6.5 7.0
[14] 7.5 8.0 8.5 9.0 9.5 10.0
> c[1,2,3,4]
Error in c[1, 2, 3, 4] : object of type 'builtin' is not subsettable
> typeof(c)
[1] "builtin"
```

```
> c(1,2,3)
[1] 1 2 3
> class(c)
[1] "function"
> typeof(n)
[1] "double"
> d='hello'
> typeof(d)
[1] "character"
> class(d)
[1] "character"
> x<-5
> x
[1] 5
> x=1:5
> x
[1] 1 2 3 4 5
> y=rep(1:5, times=3)
> y
[1] 1 2 3 4 5 1 2 3 4 5 1 2 3 4 5
> a[4:10]
Error: object 'a' not found
> x[2:4]
[1] 2 3 4
> class(x)
[1] "integer"
> typeof(x)
[1] "integer"
> x=2:10
> mat=matrix(x, nrow=3, ncol=3, byrow=T)
> mat
      [,1] [,2] [,3]
```

```

[1,]    2    3    4
[2,]    5    6    7
[3,]    8    9   10
> mat[3,2]
[1] 9
> mat[3,]
[1]  8  9 10
> tran=t(mat)
> tran
      [,1] [,2] [,3]
[1,]    2    5    8
[2,]    3    6    9
[3,]    4    7   10
> mat+tran
      [,1] [,2] [,3]
[1,]    4    8   12
[2,]    8   12   16
[3,]   12   16   20
> mat-tran
      [,1] [,2] [,3]
[1,]    0   -2   -4
[2,]    2    0   -2
[3,]    4    2    0
> mat*tran
      [,1] [,2] [,3]
[1,]    4   15   32
[2,]   15   36   63
[3,]   32   63  100
> l=list(1,2,3,4)
> l
[[1]]
[1] 1

```

```
[[2]]
```

```
[1] 2
```

```
[[3]]
```

```
[1] 3
```

```
[[4]]
```

```
[1] 4
```

```
> print(mean(25:82))
```

```
[1] 53.5
```

```
> print(sum(41:68))
```

```
[1] 1526
```

```
> print(median(1:9))
```

```
[1] 5
```