Lab 1

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1. **Basic commands.**

   ```
   1+2
   2*3
   6/3
   a=1
   b=4
   a+b
   a-b
   a*b
   a/b
   search()
   a=readline("Enter a number")
   ls()
   getwd()
   list.files()
   ```

   ```
   > 1+2
   [1] 3
   > 2*3
   [1] 6
   > 6/3
   [1] 2
   > a=1
   > b=4
   > a+b
   [1] 5
   > a-b
   [1] -3
   > a*b
   [1] 4
   > a/b
   [1] 0.25
   > search()
    [1] ".GlobalEnv"        "tools:rstudio"     "package:stats"     "package:graphics"  "package:grDevices"
    [6] "package:utils"     "package:datasets"  "package:methods"   "Autoloads"         "package:base"
   > a=readline("Enter a number")
   Enter a number5
   > ls()
   [1] "a" "b"
   > getwd()
   [1] "C:/Users/Manikanta Bhuvanesh/Documents"
   > list.files()
    [1] "AudFree Spotify Music Converter"   "Custom Office Templates"        "Dell"
    [4] "desktop.ini"                       "Downloads"                      "EasyBCD Backup (2021-07-16).bcd"
    [7] "Enscape"                           "Inventor Server for AutoCAD"    "My Data Sources"
   [10] "My Games"                          "My Music"                       "My Pictures"
   [13] "My Shapes"                         "My Videos"                      "Nicepage"
   [16] "Nicepage Templates"                "PowerPoint Save Lab Local Storage" "R"
   [19] "TuneCable Spotify Downloader"      "Visual Studio 2019"             "windows.iso"
   > |
   ```

2. **Create vector of numeric, complex, logical and character types of any length.**

   ```
   a=c(1,2,3,4,5,6)
   a
   b=c(1+3i,2+4i,5+8i,8+7i)
   b
   d=c("T","F","F","T","F","T","T")
   d
   o=c('a','b','c','d')
   o
   f=c(1,3,5,3+4i,"T",'a')
   f
   ```

```
> a=c(1,2,3,4,5,6)
> a
[1] 1 2 3 4 5 6
> b=c(1+3i,2+4i,5+8i,8+7i)
> b
[1] 1+3i 2+4i 5+8i 8+7i
> d=c("T","F","F","T","F","T","T")
> d
[1] "T" "F" "F" "T" "F" "T" "T"
> o=c('a','b','c','d')
> o
[1] "a" "b" "c" "d"
> f=c(1,3,5,3+4i,"T",'a')
> f
[1] "1"    "3"    "5"    "3+4i" "T"    "a"
>
```

3. Create vector a and b and both of them and store it in a.

a=c(1,5,3,87,3,8)

b=c(4,8,6,5,9,3,9,4)

a=c(a,b)

a

```
> a=c(1,5,3,87,3,8)
> b=c(4,8,6,5,9,3,9,4)
> a=c(a,b)
> a
 [1]  1  5  3 87  3  8  4  8  6  5  9  3  9  4
>
```

4. Create a vector a that includes null values. Find mean, product and sum.

a=c(1,4,6,7,2,NA,28,NA,NA,7)

mean(a, na.rm=TRUE)

sum(a, na.rm=TRUE)

prod(a, na.rm=TRUE)

```
> a=c(1,4,6,7,2,NA,28,NA,NA,7)
> mean(a, na.rm=TRUE)
[1] 7.857143
> sum(a, na.rm=TRUE)
[1] 55
> prod(a, na.rm=TRUE)
[1] 65856
>
```

5. Create a vector of size 10. Find highest and lowest value in the vector.

g=c(23,1,3,54,56,86,23,45,67,87)

max(g)

min(g)

```
> g=c(23,1,3,54,56,86,23,45,67,87)
> max(g)
[1] 87
> min(g)
[1] 1
```

6. Find second highest element in a vector.

sort(g,TRUE)[2]

```
> sort(g,TRUE)[2]
[1] 86
>
```

7. Using Interest function on three vectors.

a=c(500,465,700,478,892,446)

w=(0.8*5)/100

p=a*w

p

8. Duplicated and unique elements in a vector.

t=c(2,2,4,5,7,4,8,4)

unique(t)

t[duplicated(t)]

```
> t=c(2,2,4,5,7,4,8,4)
> unique(t)
[1] 2 4 5 7 8
> t[duplicated(t)]
[1] 2 4 4
>
```

9. Create vectors a, b, c. Convert these into 3*3 matrix.

a=c(1,2,3)

b=c(4,5,6)

c=c(7,8,9)

p=cbind(a,b,c)

p

```
> a=c(1,2,3)
> b=c(4,5,6)
> c=c(7,8,9)
> p=cbind(a,b,c)
> p
     a b c
[1,] 1 4 7
[2,] 2 5 8
[3,] 3 6 9
>
```