

Descriptive Statistics With R Software

Calculations with R Software

:::

Basics and R as a Calculator

Shalabh

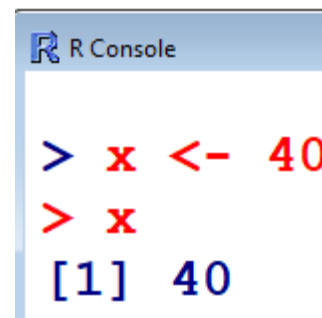
Department of Mathematics and Statistics

Indian Institute of Technology Kanpur

Basics

- `>` is the prompt sign in R.
- The assignment operators are the left arrow with dash `<-` and equal sign `=`.

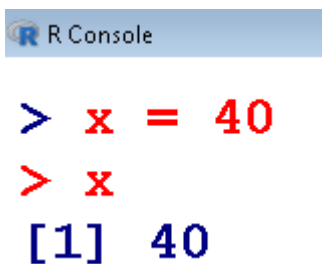
`> x <- 40` assigns the value 40 to `x`.



```
R Console
> x <- 40
> x
[1] 40
```

`> x = 40` assigns the value 40 to `x`.

Initially only `<-` was available in R.



```
R Console
> x = 40
> x
[1] 40
```

Basics

`> x = 40` assigns the value 40 to `x`.

`> y = x * 3` assigns the value $3 \cdot x$ to `y`.

`> z = x - y` assigns the value $x - y$ to `z`.

R Console

```
> y = x * 3
> y
[1] 120
```

R Console

```
> z = x - y
> z
[1] -80
```

Basics

- # : The character # marks the beginning of a comment.

All characters until the end of the line are ignored.

```
> # mu is the mean
```

```
> # x = 40 is treated as comment only
```

Basics

- Capital and small letters are different.
`> X = 40` and `> x = 40` are different

```
R Console  
  
> X = 40  
> X  
[1] 40
```

```
R Console  
  
> x=40  
> x  
[1] 40  
>  
> X  
Error: object 'X' not found  
>  
> X=30  
> X  
[1] 30  
> x  
[1] 40
```

Basics

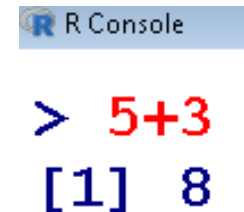
- The command `c(1,2,3,4,5)` combines the numbers 1,2,3,4 and 5 to a vector.

```
R Console
> y=1,2,3,4,5
Error: unexpected ',' in "y=1,"
>
> y=(1,2,3,4,5)
Error: unexpected ',' in "y=(1,"
>
> y=c(1,2,3,4,5)
>
> y
[1] 1 2 3 4 5
```

R as a calculator

Addition

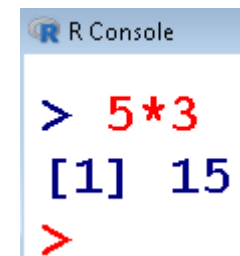
```
> 5+3          # Command  
[1] 8          # Output
```



A screenshot of the R Console window showing the command `> 5+3` and the output `[1] 8`. The prompt `>` is red, the command `5+3` is red, and the output `[1] 8` is blue.

Multiplication

```
> 5*3          # Command  
[1] 15          # Output
```

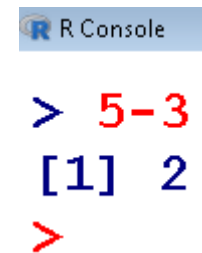


A screenshot of the R Console window showing the command `> 5*3` and the output `[1] 15`. The prompt `>` is red, the command `5*3` is red, and the output `[1] 15` is blue. A new red prompt `>` is visible on the next line.

R as a calculator

Subtraction

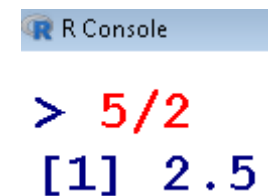
```
> 5-3          # Command  
[1] 2          # Output
```



A screenshot of the R Console showing the command `> 5-3` and the output `[1] 2`. The prompt `>` is shown in red at the bottom.

Division

```
> 5/2          # Command  
[1] 2.5         # Output
```

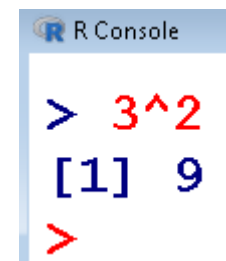


A screenshot of the R Console showing the command `> 5/2` and the output `[1] 2.5`. The prompt `>` is shown in red at the bottom.

R as a calculator

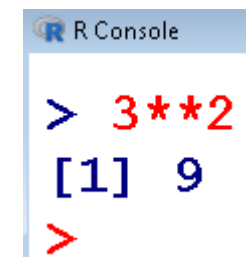
Power

```
> 3^2      # Command  
[1] 9      # Output
```



A screenshot of the R Console window. The title bar says 'R Console'. The prompt is '>'. The command '3^2' is entered in red. The output '[1] 9' is displayed in blue. A red '>' prompt is visible at the bottom.

```
> 3**2     # Command  
[1] 9      # Output
```



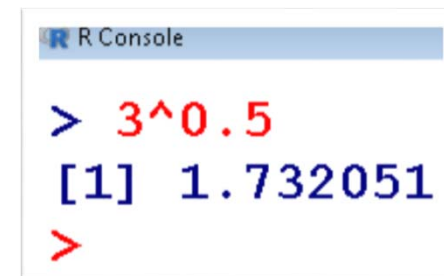
A screenshot of the R Console window. The title bar says 'R Console'. The prompt is '>'. The command '3**2' is entered in red. The output '[1] 9' is displayed in blue. A red '>' prompt is visible at the bottom.

$$3^2$$

R as a calculator

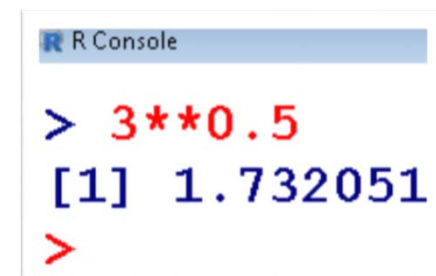
Power

```
> 3^0.5      # Command  
[1] 1.732051  # Output
```



```
R Console  
> 3^0.5  
[1] 1.732051  
>
```

```
> 3**0.5     # Command  
[1] 1.732051  # Output
```



```
R Console  
> 3**0.5  
[1] 1.732051  
>
```

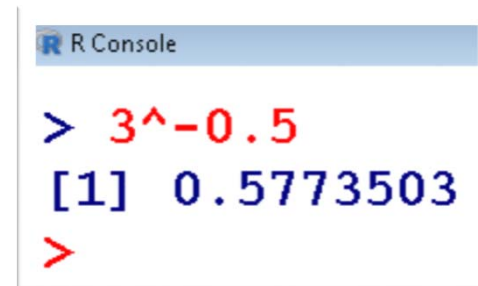
$$3^{1/2}$$

R as a calculator

Power

```
> 3^-0.5      # Command  
[1] 0.5773503  # Output
```

$$3^{-1/2}$$

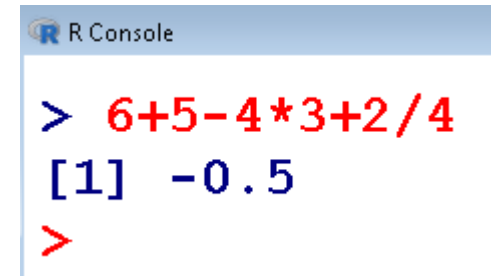


```
R Console  
> 3^-0.5  
[1] 0.5773503  
>
```

R as a calculator

Multiple operators (BODMAS)

```
> 6+5-4*3+2/4    # Command  
[1] -0.5          # Output
```

A screenshot of the R Console window. The title bar says "R Console". The prompt ">" is followed by the command "6+5-4*3+2/4" in red text. Below it, the output "[1] -0.5" is shown in blue text. A red ">" prompt is visible at the bottom.

```
R Console  
> 6+5-4*3+2/4  
[1] -0.5  
>
```