

How can I calculate and plot a CDF (cumulative distribution function) in R?

Authored by
stats writer

May 3, 2024

RECOMMENDED CITATION

stats writer (2024). *How can I calculate and plot a CDF (cumulative distribution function) in R?*. PSYCHOLOGICAL SCALES. Retrieved from <https://scales.arabpsychology.com/?p=142467>

The process of calculating and plotting a CDF (cumulative distribution function) in R involves several steps. First, the data must be imported into R and organized into a numerical vector. Then, the "ecdf" function can be used to create a CDF object from the data. This object can then be plotted using the "plot" function. Additional customization, such as adding labels and titles, can also be done using the appropriate functions. The resulting plot will be a graphical representation of the cumulative probability distribution of the data. This can be useful for understanding the overall distribution and characteristics of the data.

Calculate & Plot a CDF in R

You can use the following basic syntax to calculate and plot a cumulative distribution function (CDF) in R:

```
#calculate empirical CDF of data
```

```
p = ecdf(data)
```

```
#plot CDF
```

```
plot(p)
```

The following examples show how to use this syntax in practice.

Example 1: Calculate & Plot CDF of Raw Data

The following code shows how to calculate and plot a CDF of a random dataset in R:

```
#create some data
```

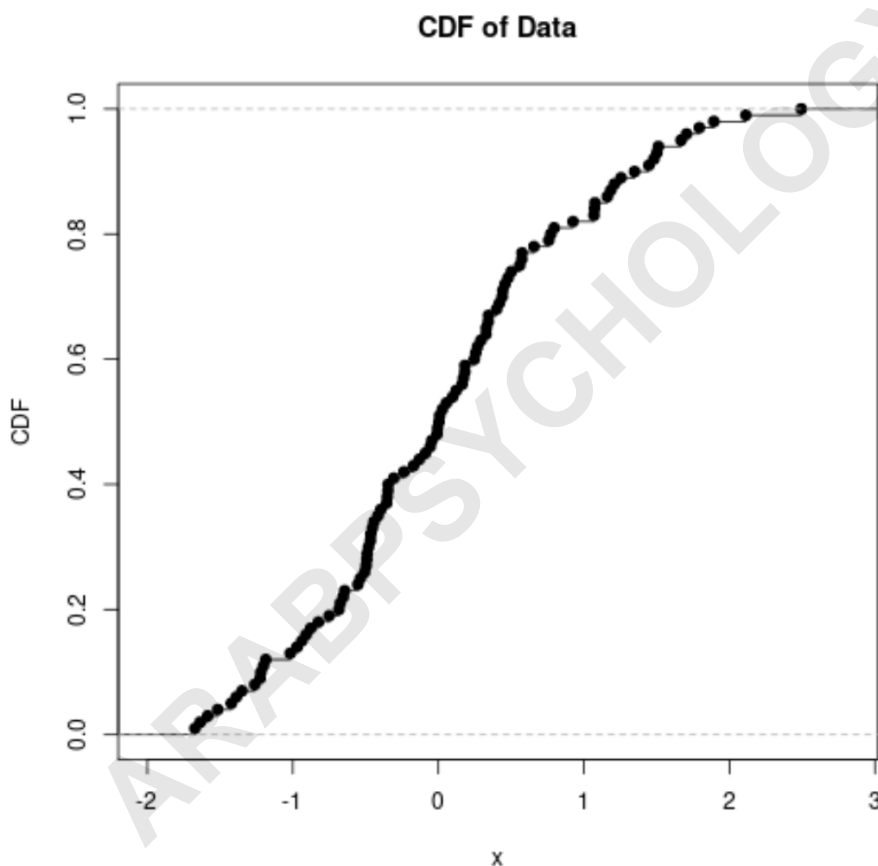
```
data = rnorm(100)
```

```
#calculate empirical CDF of data
```

```
p = ecdf(data)
```

```
#plot CDF
```

```
plot(p, xlab='x', ylab='CDF', main='CDF of Data')
```

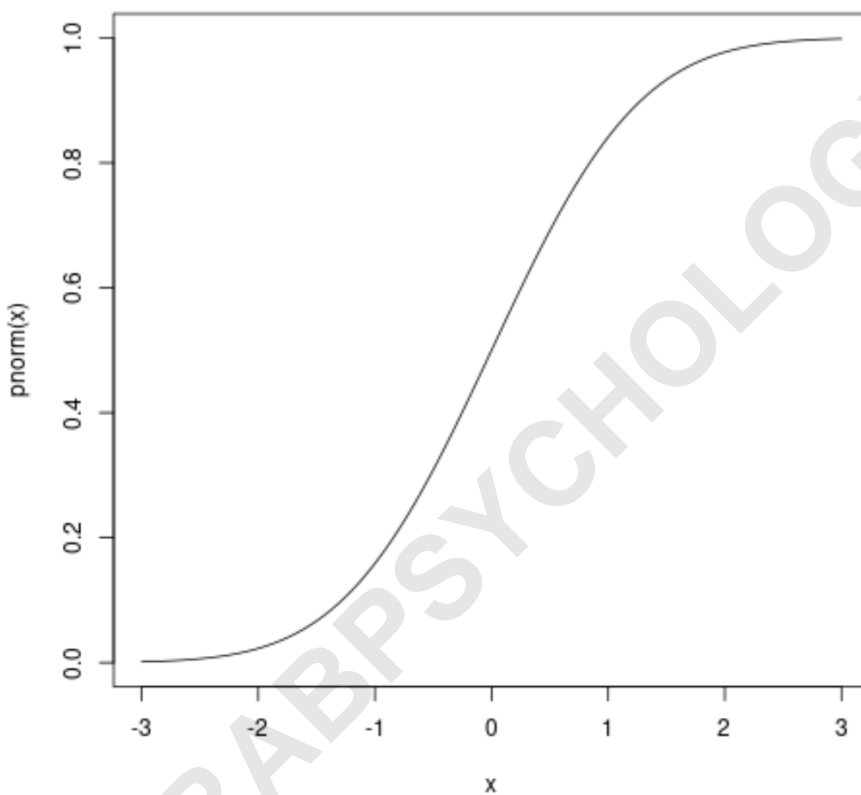


The x-axis shows the raw data values and the y-axis shows the corresponding CDF values.

Example 2: Calculate & Plot CDF of Known Distribution

The following code shows how to calculate and plot a CDF of the standard normal distribution:

```
curve(pnorm, from = -3, to = 3)
```



Alternatively, you can create the same plot using ggplot2:

```
library(ggplot2)
```

```
ggplot(data.frame(x = c(-3, 3)), aes(x = x)) +
```

stat_function(fun = pnorm)

