## Plotting with plotpdf()

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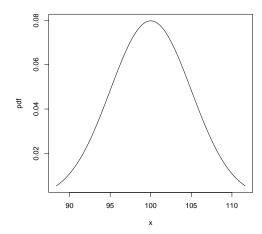
The function plotpdf() plots a function, usually probability density (pdf) or cumulative distribution function (cdf), over an interval containing the "interesting" part of the function. The interval is based on quantiles computed from a supplied cdf or quantile function.

plotpdf() is most useful when the quantiles are not readily available but here are some examples with a normal distribution to illustrate the idea:

```
> pdf1 \leftarrow function(x) dnorm(x, mean = 100, sd = 5) \# pdf
> qdf1 \leftarrow function(x) qnorm(x, mean = 100, sd = 5) \# qf
> cdf1 \leftarrow function(x) pnorm(x, mean = 100, sd = 5) \# cdf
```

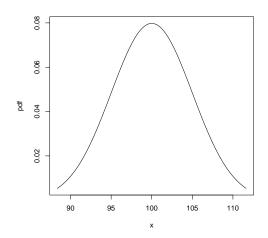
plot(pdf1) works but needs arguments 'from' and 'to' for a meaningful plot. We can simply pass the quantile function to plotpdf() to achieve this:

```
> plotpdf(pdf1, qdf1)
```



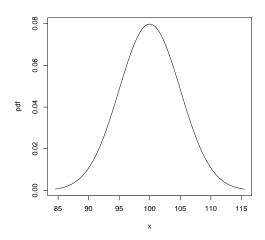
Similar result is obtained by supplying the cdf, which is handy when the quantiles are not easily available:

```
> plotpdf(pdf1, cdf = cdf1)
```

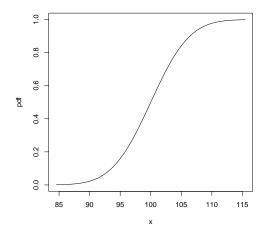


By default, the lower and upper 0.01 quantiles are used to set the limits on the x-axis. This can be changed with arguments 1q and uq

> plotpdf(pdf1, cdf = cdf1, lq = 0.001, uq = 0.999)



> plotpdf(cdf1, cdf = cdf1, lq = 0.001, uq = 0.999) # plot a cdf

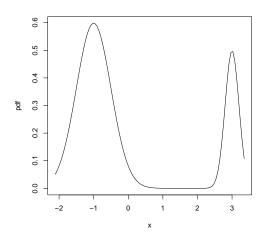


The pdf and cdf of a mixture distribution are usually straight-forward. Here is an example:

```
> pf1 <- function(x){
+     0.25 * pnorm(x, mean = 3, sd = 0.2) + 0.75 * pnorm(x, mean = -1, sd = 0.5)
+ }
> df1 <- function(x){
+     0.25 * dnorm(x, mean = 3, sd = 0.2) + 0.75 * dnorm(x, mean = -1, sd = 0.5)
+ }</pre>
```

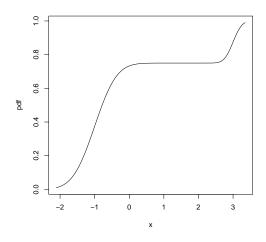
Here is a plot of the pdf:

> plotpdf(df1, cdf = pf1) # plot the pdf

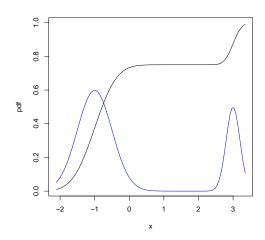


... and this produces the cdf:

> plotpdf(pf1, cdf = pf1) # plot the cdf



Additional arguments can be specified as for plot():



plotpdf() uses cdf2quantile() to compute quantiles from a cdf. cdf2quantile() can be used directly, as well:

$$> c(q5pc = cdf2quantile(0.05, pf1), q95pc = cdf2quantile(0.95, pf1))$$