Add legends to plots in R software : the easiest way!

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The goal of this article is to show you how to add **legends** to plots using **R statistical software**.

R legend function

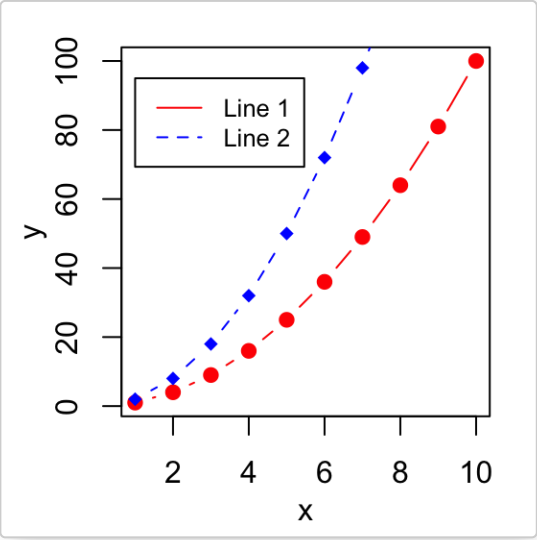
To add **legends** to plots in **R**, the **R legend()** function can be used. A simplified format of the function is :

```
legend(x, y=NULL, legend, fill, col, bg)
```

- **x and y** : the x and y co-ordinates to be used to position the legend
- **legend** : the text of the legend
- **fill** : colors to use for filling the boxes beside the legend text
- **col** : colors of lines and points beside the legend text
- **bg** : the background color for the legend box.

Example :

```
# Generate some data
x<-1:10; y1=x*x; y2=2*y1
plot(x, y1, type="b", pch=19, col="red", xlab="x", ylab="y")
# Add a line
lines(x, y2, pch=18, col="blue", type="b", lty=2)
# Add a legend
legend(1, 95, legend=c("Line 1", "Line 2"),
       col=c("red", "blue"), lty=1:2, cex=0.8)
```



To avoid repeating the above **R** code, we can create a custom plot function as follow :

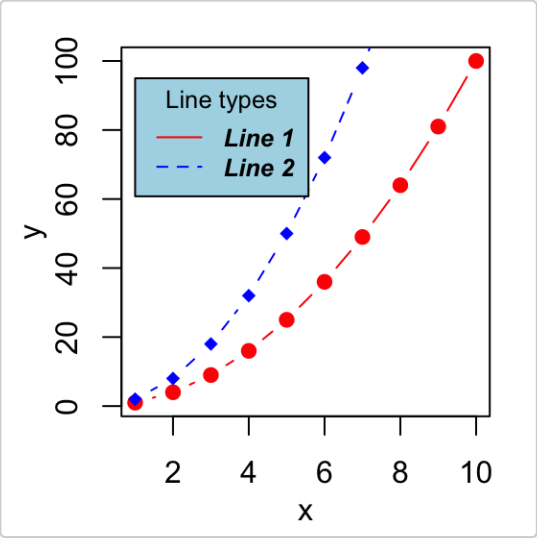
```
makePlot<-function(){
  x<-1:10; y1=x*x; y2=2*y1
  plot(x, y1, type="b", pch=19, col="red", xlab="x", ylab="y")
  lines(x, y2, pch=18, col="blue", type="b", lty=2)
}
```

Title, text font and background color of the legend box

The arguments below can be used :

- **title**: The title of the legend
- **text.font**: an integer specifying the font style of the legend text; possible values are :
  - **1**: normal
  - **2**: bold
  - **3**: italic
  - **4**: bold and italic
- **bg**: background color of the legend box

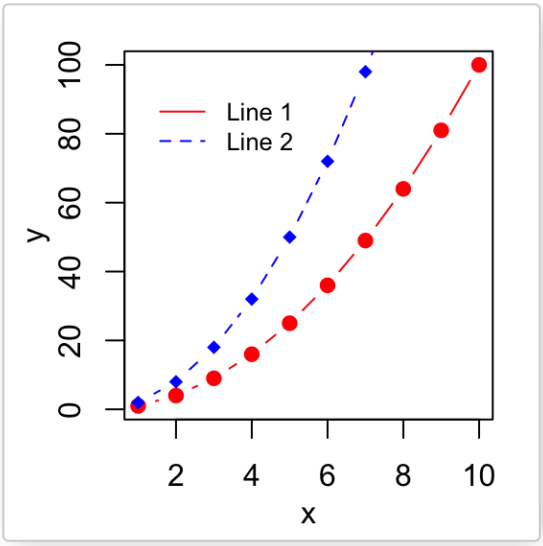
```
makePlot()
# Add a legend to the plot
legend(1, 95, legend=c("Line 1", "Line 2"),
       col=c("red", "blue"), lty=1:2, cex=0.8,
       title="Line types", text.font=4, bg='lightblue')
```

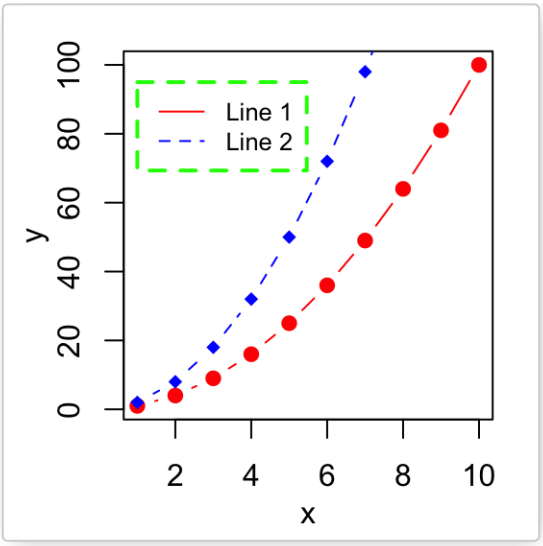


Border of the legend box

The arguments **box.lty, box.lwd and box.col** can be used to modify the line type, width and color for the legend box border, respectively.

```
# Remove legend border using box.lty = 0
makePlot()
legend(1, 95, legend=c("Line 1", "Line 2"),
       col=c("red", "blue"), lty=1:2, cex=0.8,
       box.lty=0)
# Change the border
makePlot()
legend(1, 95, legend=c("Line 1", "Line 2"),
       col=c("red", "blue"), lty=1:2, cex=0.8,
       box.lty=2, box.lwd=2, box.col="green")
```

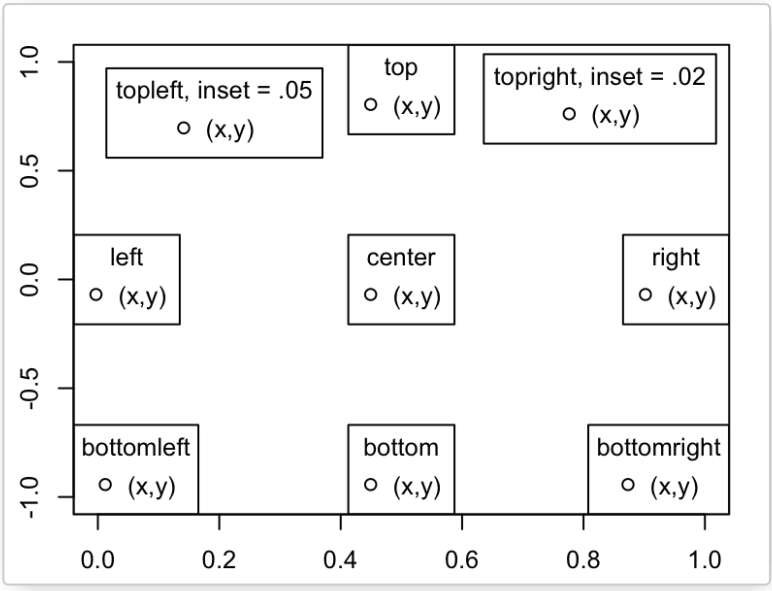




Specify legend position by keywords

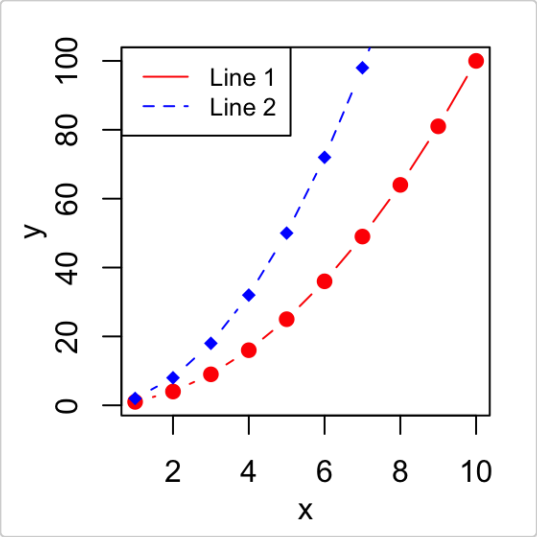
The position of the legend can be specified also using the following keywords : `"bottomright"`, `"bottom"`, `"bottomleft"`, `"left"`, `"topleft"`, `"top"`, `"topright"`, `"right"` and `"center"`.

The effect of using each of these keywords are shown in the figure below :



Example 1: line plot

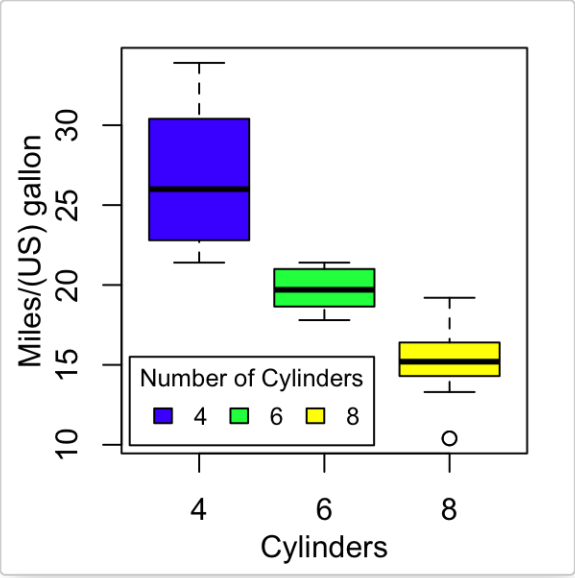
```
#  Example 1: line plot
makePlot()
legend("topleft", legend=c("Line 1", "Line 2"),
       col=c("red", "blue"), lty=1:2, cex=0.8)
```



Example 2: box plot

```
attach(mtcars)
boxplot(mpg~cyl,
        xlab="Cylinders", ylab="Miles/(US) gallon",
        col=topo.colors(3))

legend("bottomleft", inset=.02, title="Number of Cylinders",
   c("4","6","8"), fill=topo.colors(3), horiz=TRUE, cex=0.8)
```



Note that the argument `fill` indicates the colors to use for filling the boxes beside the legend text

Infos

This analysis has been performed using **R statistical software** (ver. 3.1.0).