Universiti Kebangsaan Malaysia
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FAKULTI SAINS & TEKNOLOGI

DATA VISUALIZATION WITH R

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Common Arguments

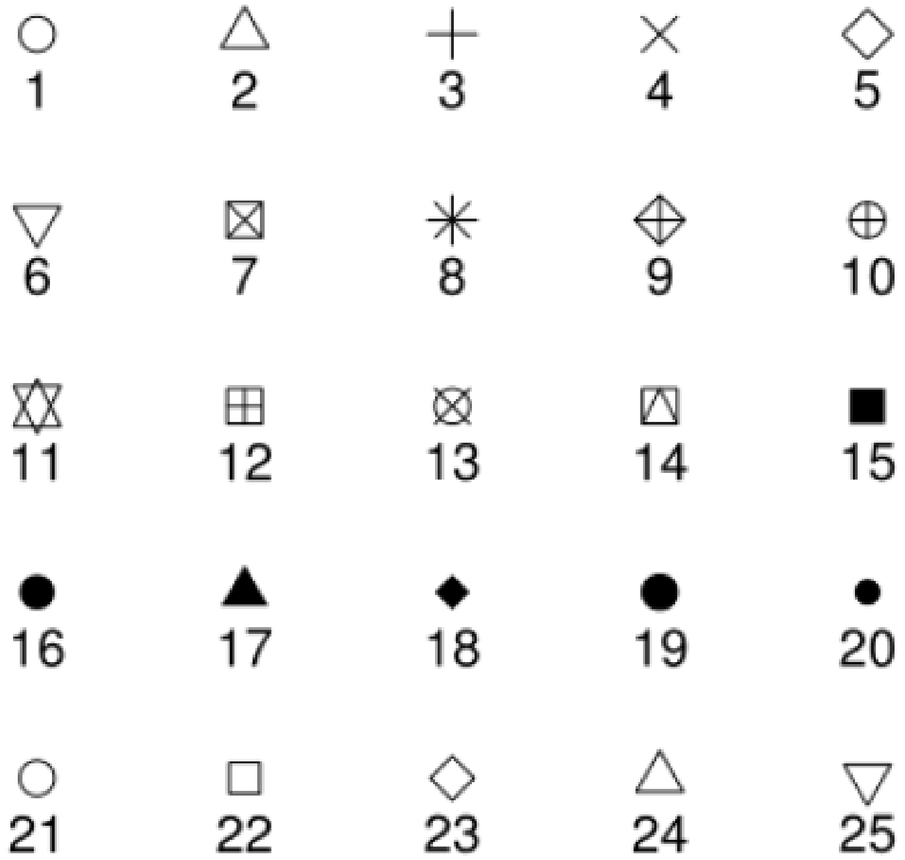
- For most charts in basic R, common arguments across various functions can be applied.
- We can add the title by using arguments such as `main=` for the header, `sub=` for subtitles, `xlab=` for the labels in x-axis and `ylab=` for labels of the y-axis.
- The font size can be adjusted using the argument `cex` with `cex.main`, `cex.sub`, `cex.axis` and `cex.lab`.
- The colours are changed using the argument `col` with `col.main`, `col.sub`, `col.axis`, `col.lab` and `col` (for the points and lines).
- We can set the range for our graph using the argument `ylim=` and `xlim=`.

The `plot` Function

- Use for scatter plot and line graph.
- If two vectors are provided in the argument, the first will be the values for the x-axis and the second is the values for the y-axis.
- If only one vector is given as the argument, it will be taken as the values for the y-axis and the scatter plot is against the index for the vector.
- The function could also take the form `plot(y~x,data=…)`
- By default, the plots will be in points. We can change this using the argument `type=`

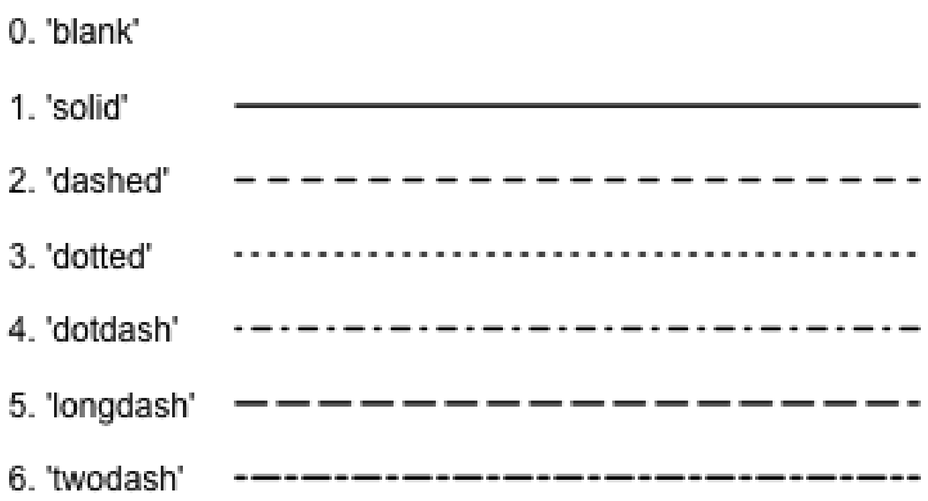
The `plot` Function

- You can change the style of the points using the argument `pch=`



The `plot` Function

- The lines can be edited using the argument `lty=`

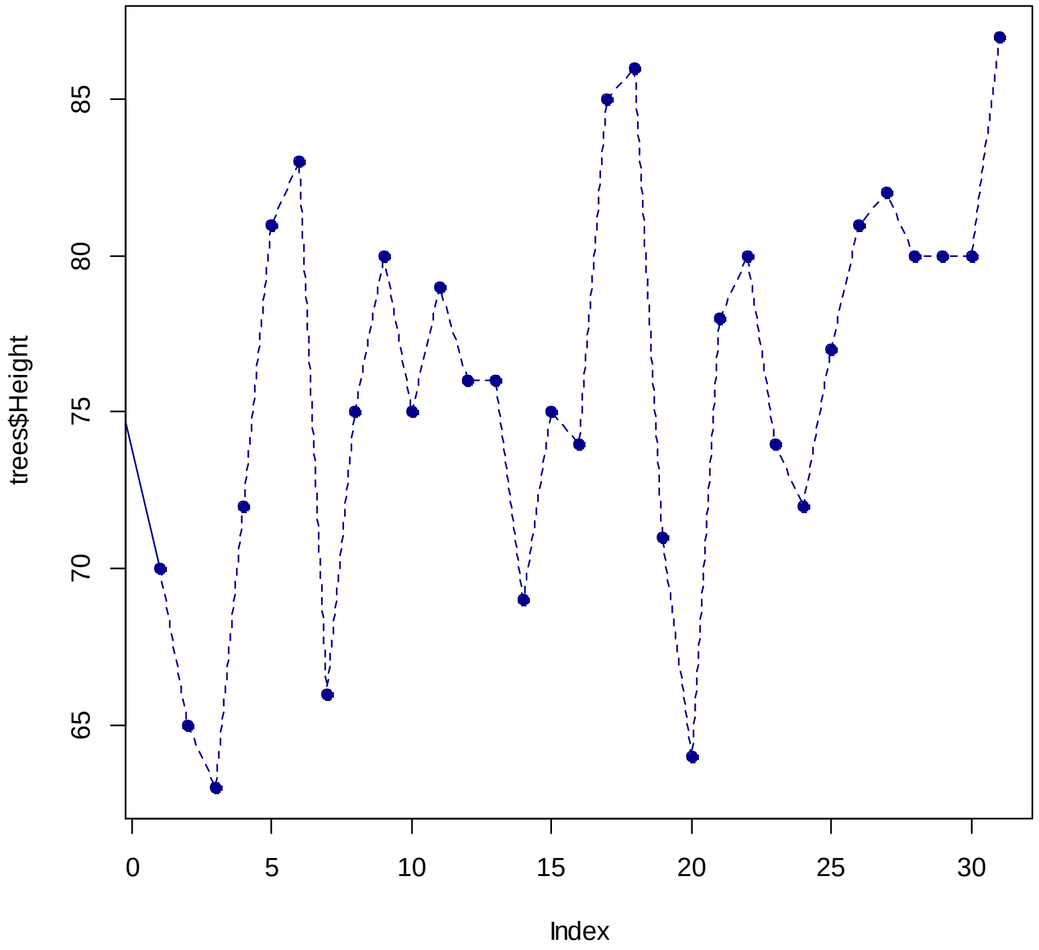


- The colours are changed using the argument `col=`

The `plot` Function

- **Example:**

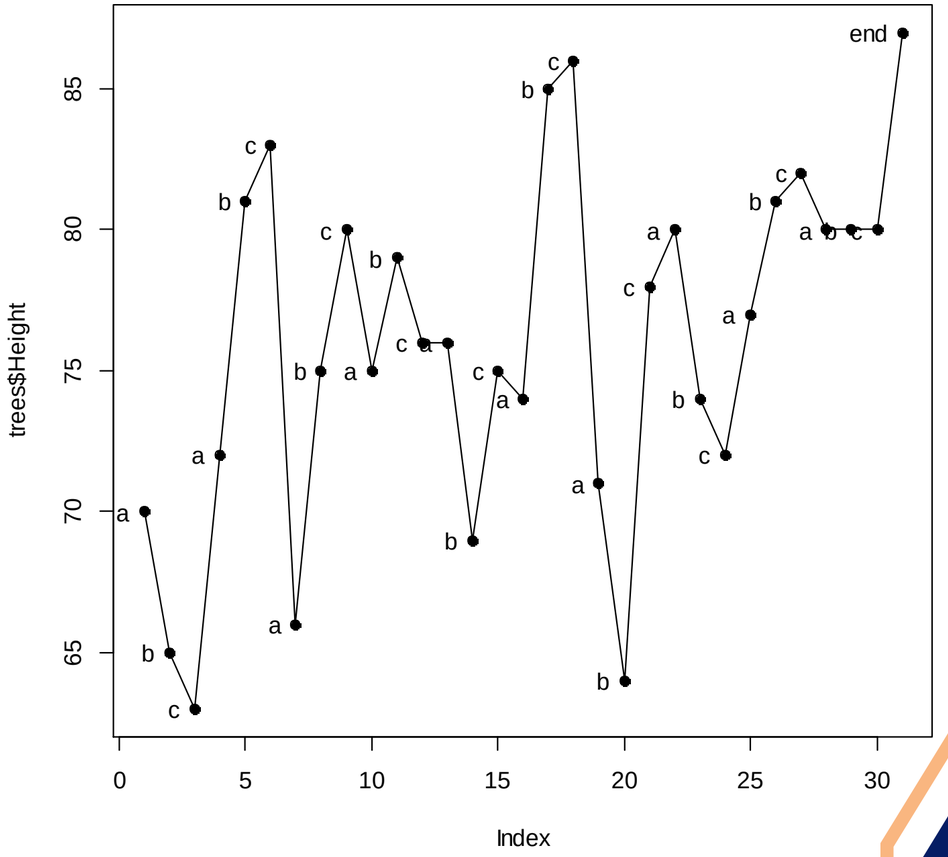
```
plot(trees$Height, type="o",
pch=19,lty=2,col="darkblue")
```



The `text` Function

- **Use `text()` function to add text in a graph.**
- The argument `pos=` **will set the position of the text in the graph with `1, 2, 3` and `4` indicate below, to the left, above and to the right respectively.**
- **Example:**

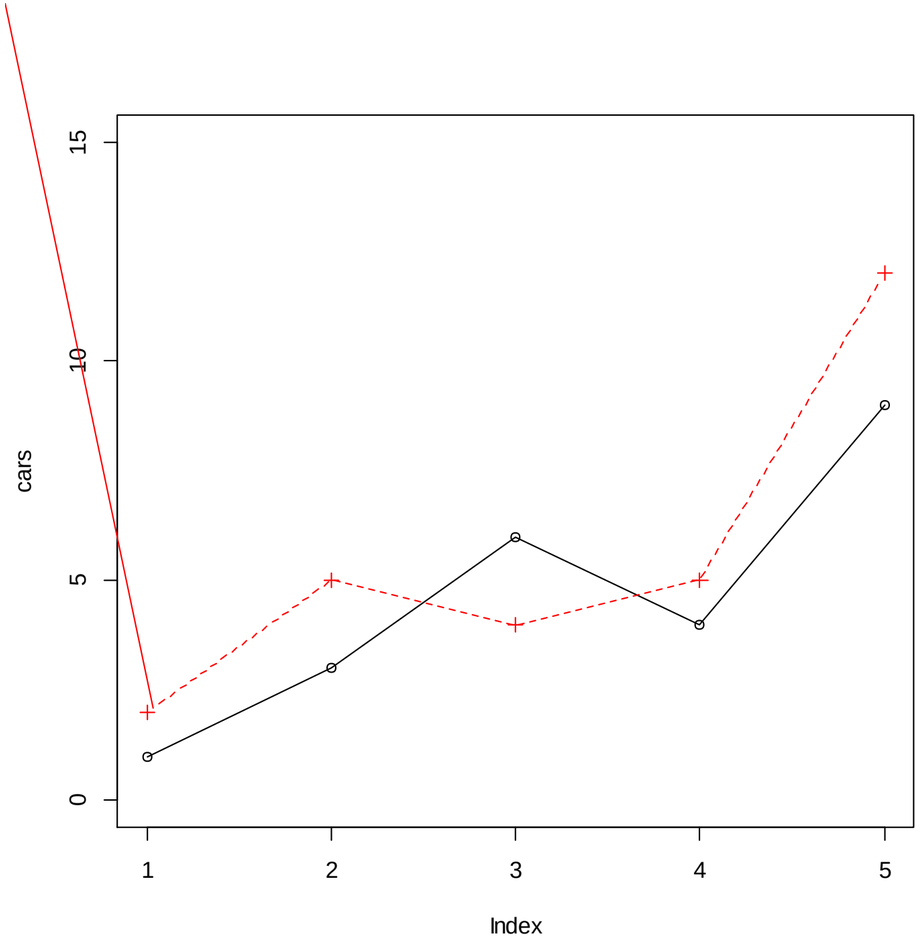
```
plot(trees$Height,type="o",pch=19)
tplot<-c(rep(c("a","b","c"),10),"end")
text(trees$Height,tplot,pos=2)
```



The `points` and `lines` Functions

- Add points and lines to existing graph.
- Example:

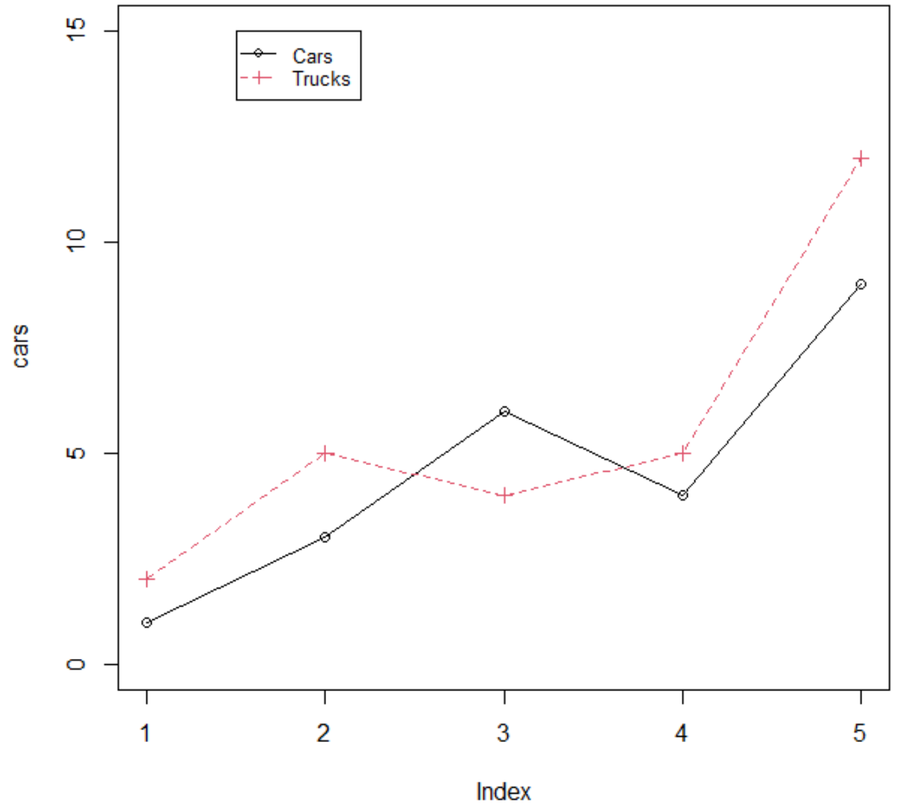
```
points(trucks,pch=2,col=2)
lines(trucks,lty=2,col=2)
```



The `legend` Function

- Use `legend()` function to add legend for the graph.
- Example:

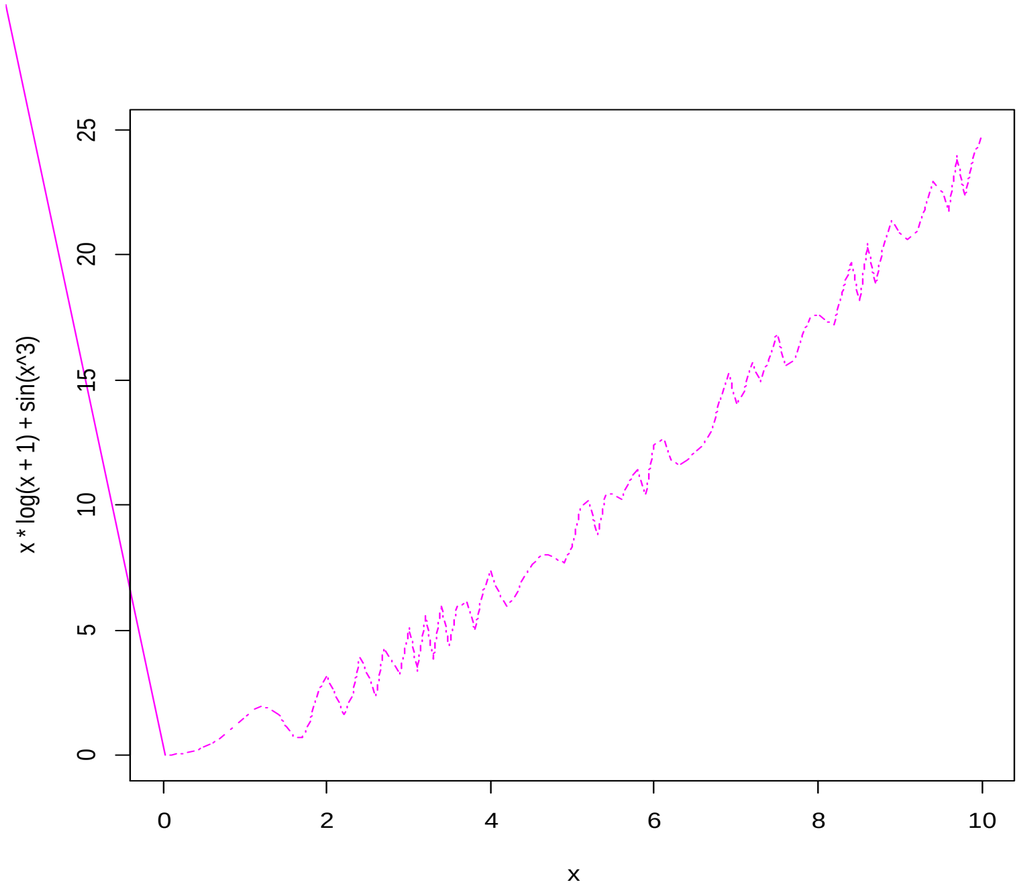
```
legend(1.5,15,cex=0.8,lty=1:2,
col=c(1,2),pch=c(1,3),c("Cars",
"Trucks"))
```



The `curve` Function

- Plot curves by inserting the equation of a curve in the `curve()` function.
- Similar to the `plot()` function, you can change the colour, font, and so on.
- Example:

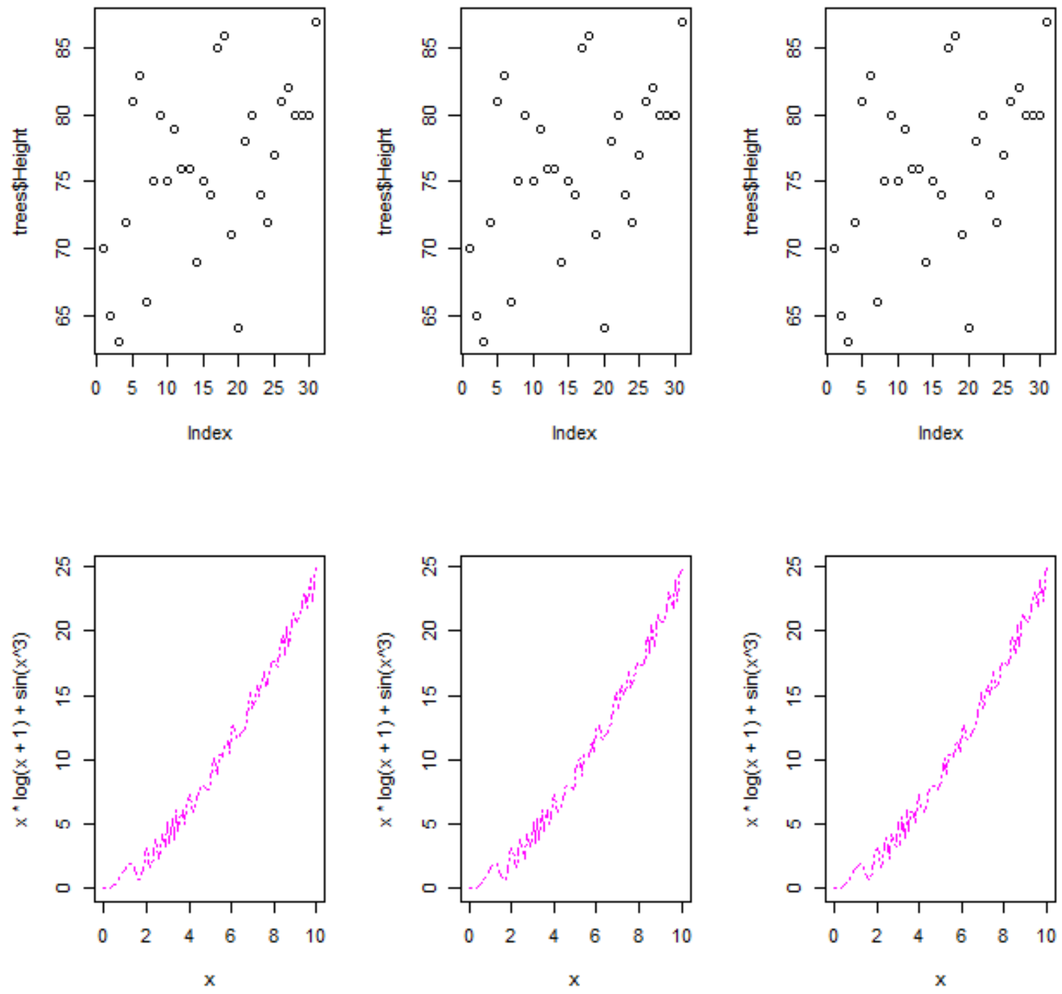
```
curve(x*log(x+1)+sin(x^3),from=0,
to=10,col="magenta",lty=4)
```



The `par` Function

- Use `par()` function to plot multiple graphs in one window.
- Example:

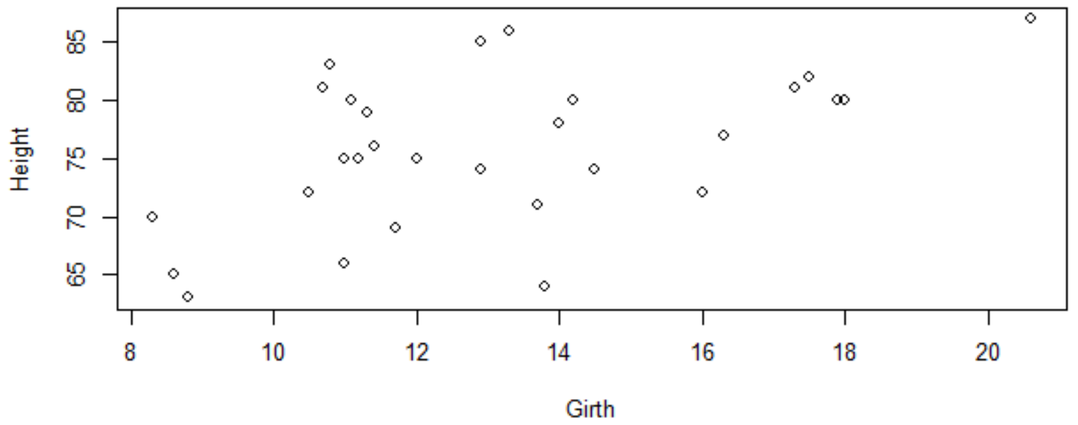
```
par(mfrow=c(2,3))
```

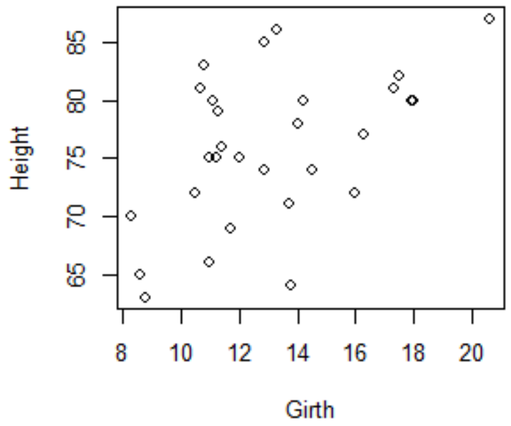


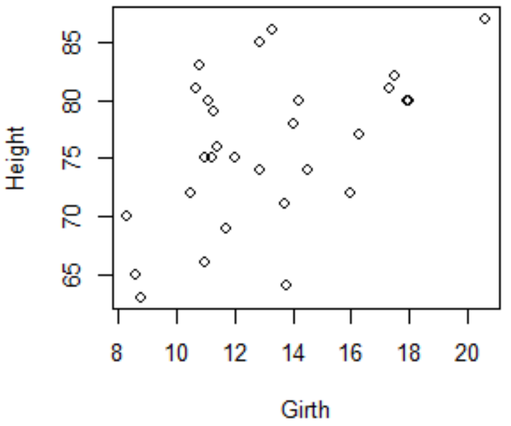
The `layout` Function

- Use `layout()` function to plot multiple graphs in one window.
- Example:

```
layout(matrix(c(1,1,2,3),nrow=2,
byrow=T))
```







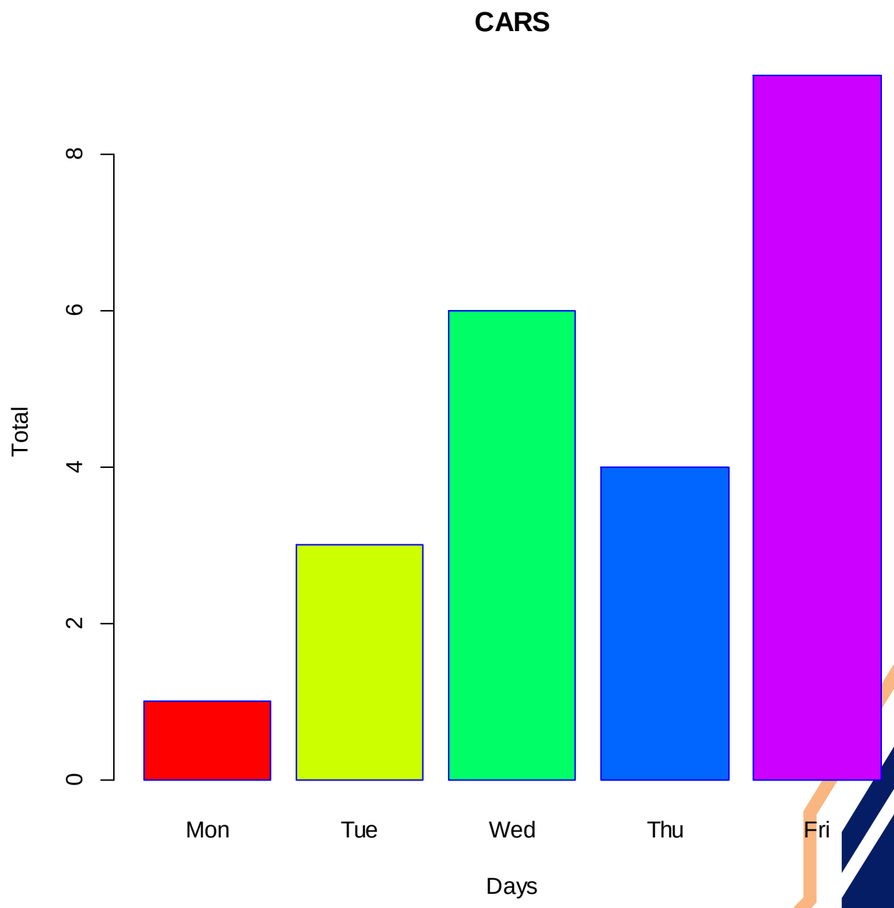
The `barplot` Function

- You can add titles and labels to the plot like the function plot().
- We can add limits for the x and y axes to the barplot.
- We can add bars to existing barplots by using argument `add=T` and adjusting the space for the plots using argument `space=`
- You can add names for each box in the plot using `names.arg=`
- If we define a variable name for the barplot, it will give us the mid points for the bars.
- The argument legend= in the barplot() function will provide legend for the bars.

The `barplot` Function

- **Example:**

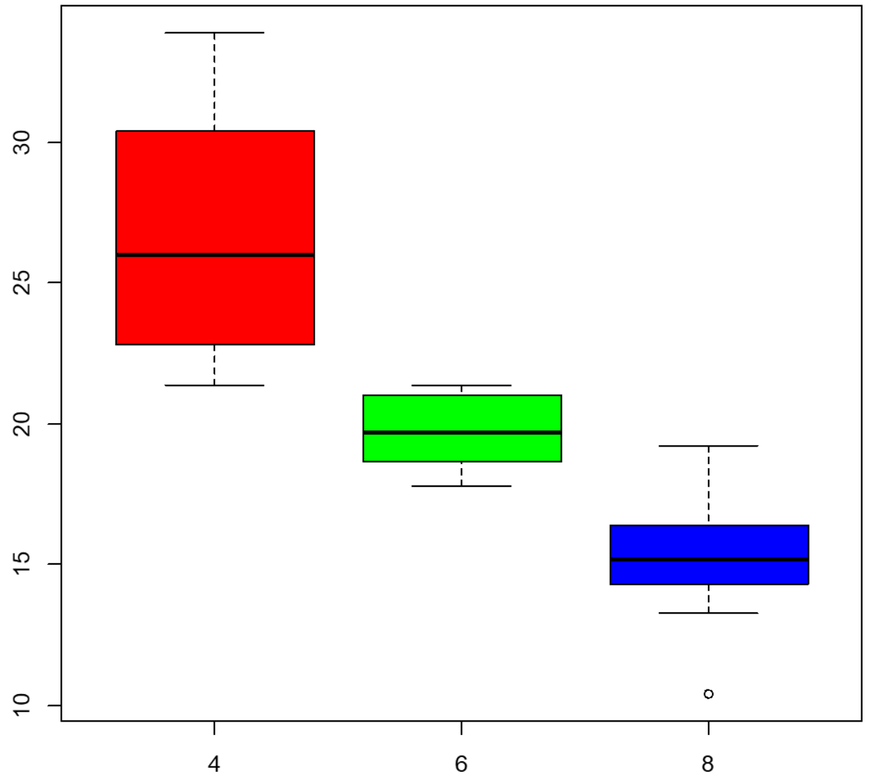
```
barplot(cars,main="CARS",xlab="Days",
ylab="Total", border="blue",
names.arg=c("Mon","Tue","Wed","Thu","Fri"),
col=rainbow(5))
```



The `boxplot` Function

- By default, the boxplots is in the vertical direction. You can change its direction by using argument `horizontal=T`.
- You can use it on continuous data as well.
- Example:

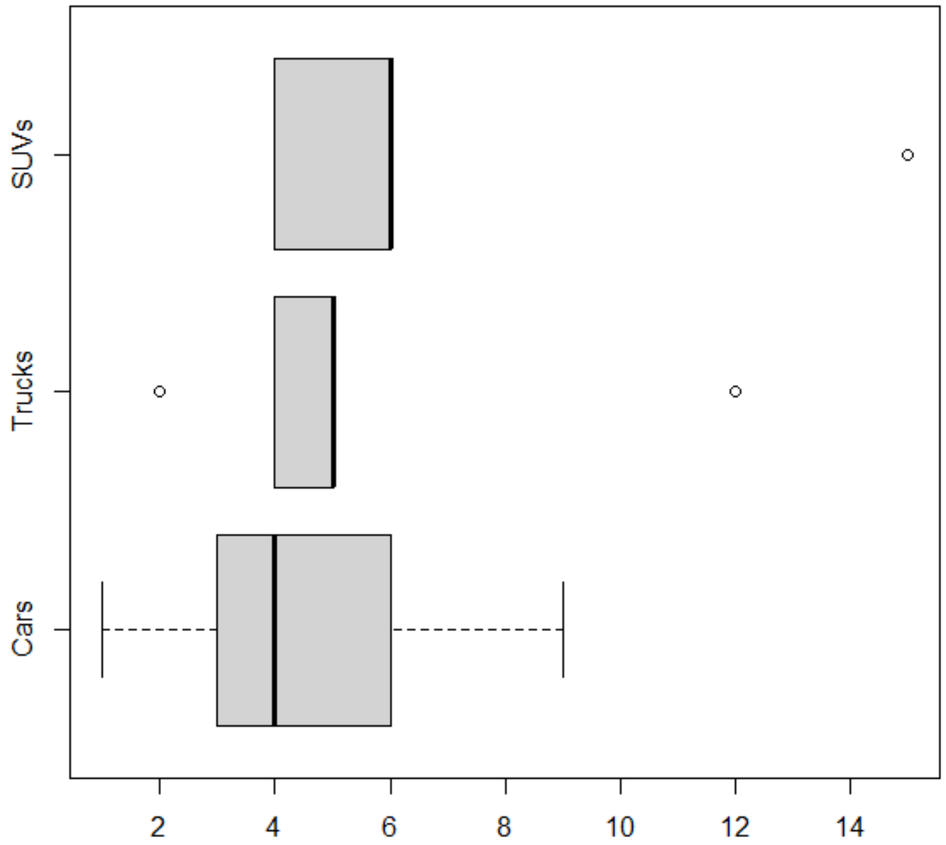
```
boxplot(mtcars$mpg~mtcars$cyl,
col=c("red", "blue", "green"))
```



The `boxplot` Function

- **Example:**

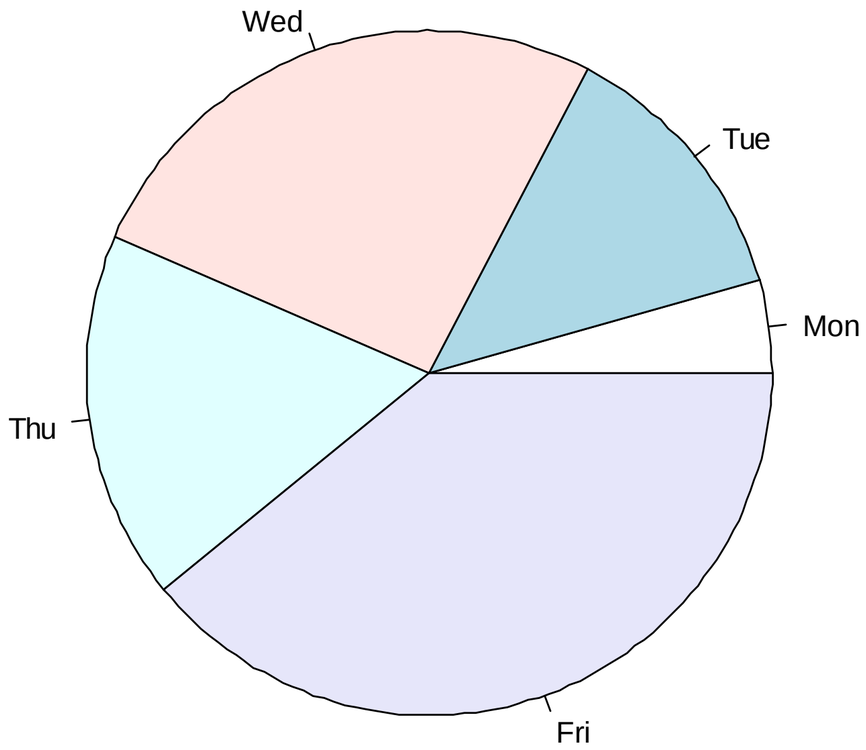
```
boxplot(cars, trucks,
suvs,names=c("Cars","Trucks","SUVs"),
horizontal=T)
```



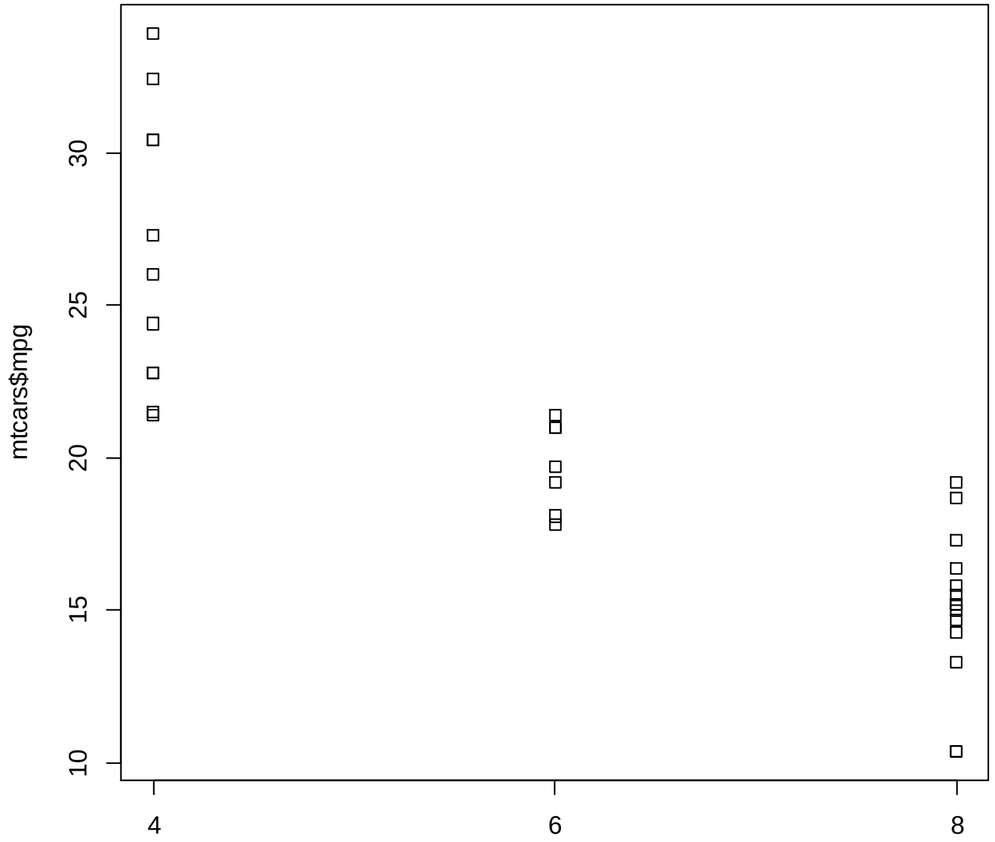
The `pie` Function

- For two-dimensional pie chart.
- Example:

```
pie(cars,labels=c("Mon","Tue","Wed","Thu","Fri"))
```



The `stripchart` Function



- By default, the stripcharts is in the horizontal direction. You can change its direction by using argument `vertical=T`.
- You can use it on continuous data as well.
- Example:

```
stripchart(mtcars$mpg~mtcars$cyl,
vertical=T)
```

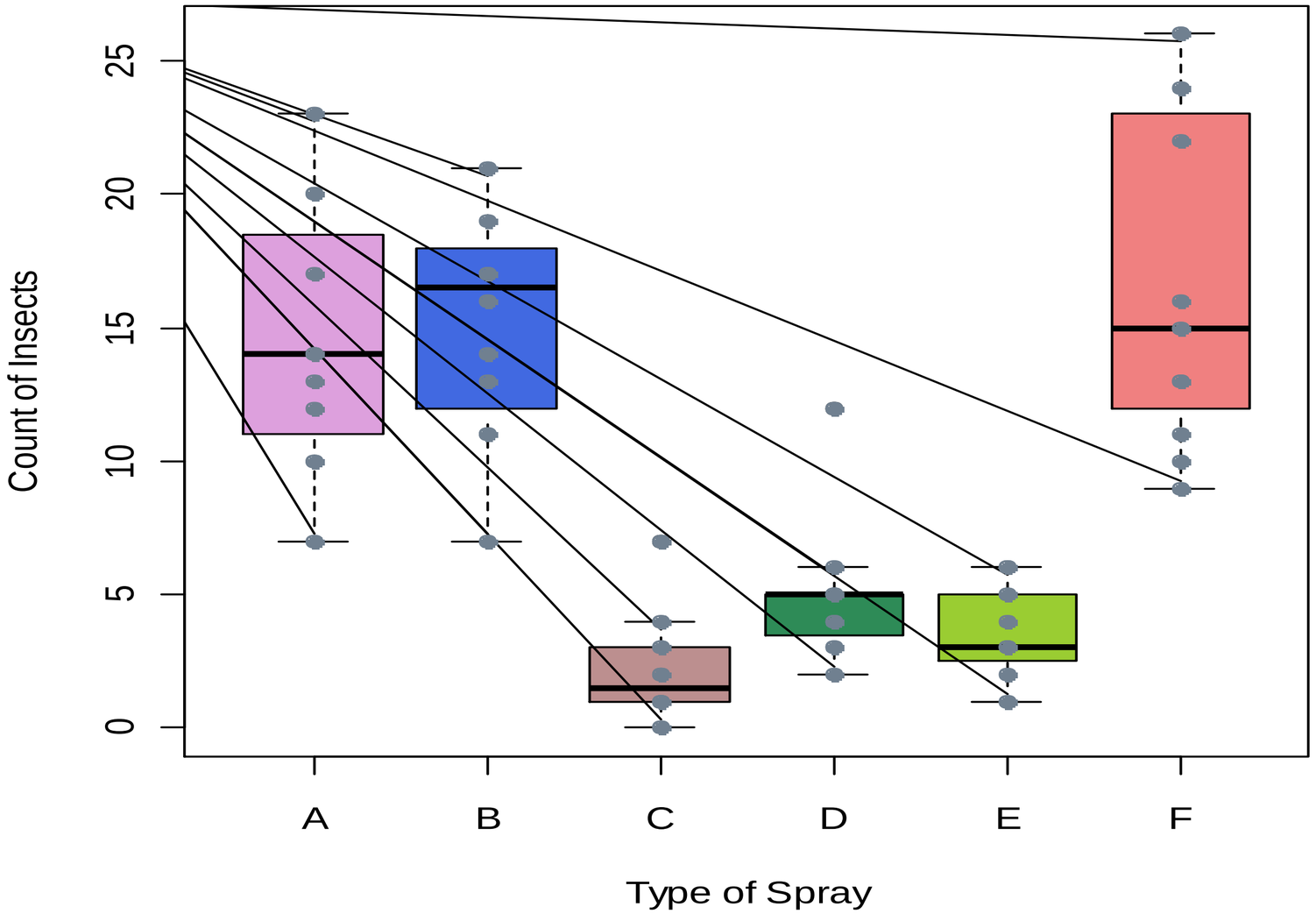
Example

- Use data insect spray (InsectSprays) from available datasets in R.
- Create boxplots for each type of spray with the colours for the boxplot A, B, C, D, E and F are plum, royalblue, rosybrown, seagreen,yellowgreen and lightcoral respectively.
- Add a stripchart to each boxplot with point style equal to 19 and the colour slategray.
- Give labels to the plot.

Example

```
data(InsectSprays)
attach(InsectSprays)
boxplot(count~spray,
col=c("plum","royalblue","rosybrown","seagreen",
"yellowgreen","lightcoral"),
xlab="Type of Spray",ylab="Count of Insects")
stripchart(count~spray,add=T,vertical=T,pch=19,
col="slategray")
```

Example



THANK YOU