

Foundations of R Software

Lecture 49

Graphics

:::

Scatter Plot and Bar Plots

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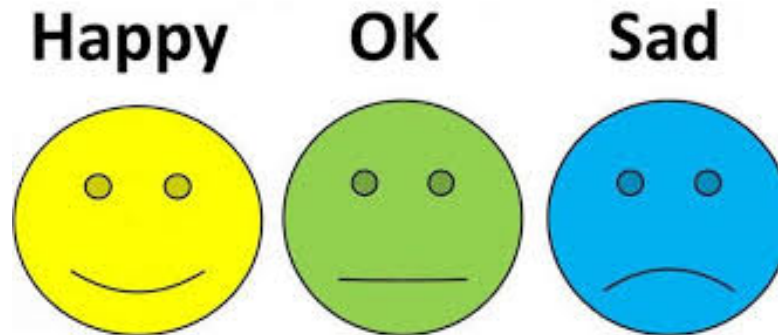
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Graphics:

Graphics summarize the information contained in a data.

For example, the mood of a person may be conveyed very easily by the smilies:



They have an advantage that they convey the information hidden inside the data more compactly

Appropriate number and choice of plots in analysis provides better inferences.

Graphics:

Graphical tools- various type of plots

- 2D & 3D plots,**
- scatter diagram**
- Pie diagram**
- Histogram**
- Bar plot**
- Stem and leaf plot**
- Box plot ...**

Appropriate number and choice of plots in analysis provides better inferences.

Graphics:

In R, Such graphics can be easily created and saved in various formats.

- Bar plot
- Pie chart
- Box plot
- Grouped box plot
- Scatter plot
- Histogram
- Various 3 dimensional plots
- ...

Scatter Plot

Plot command for one variable:

x: Data vector

plot(x)

Scatter Plot

Example

Height of 50 persons are recorded in centimeters as follows:

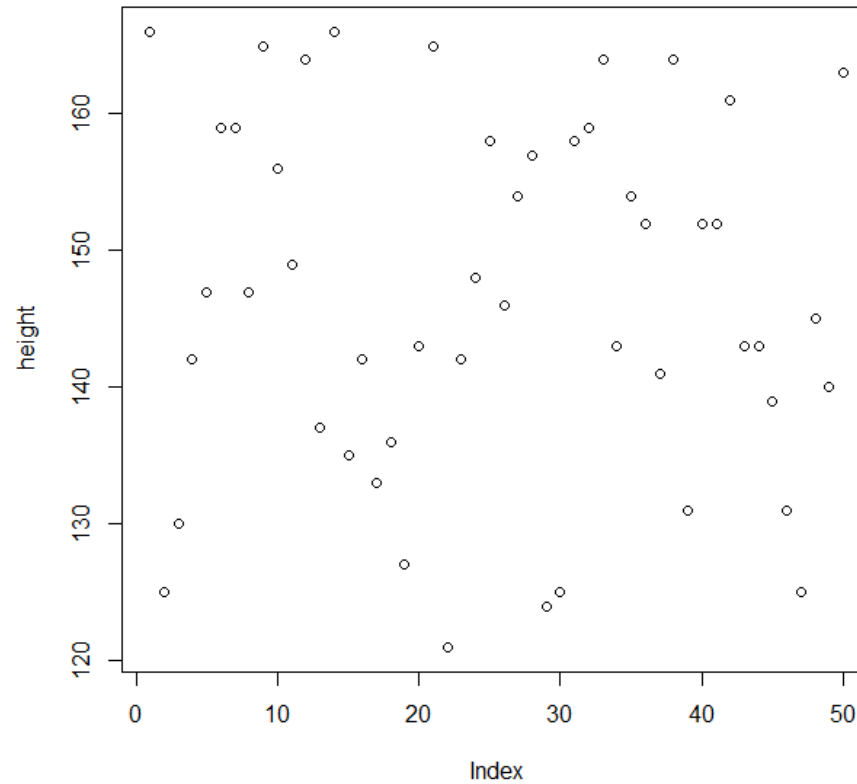
166,125,130,142,147,159,159,147,165,156,149,164,137,166,135,142,
133,136,127,143,165,121,142,148,158,146,154,157,124,125,158,159,
164,143,154,152,141,164,131,152,152,161,143,143,139,131,125,145,
140,163

```
> height = c(166,125,130,142,147,159,159,147,  
165,156,149,164,137,166,135,142,133,136,127,143,  
165,121,142,148,158,146,154,157,124,125,158,159,  
164,143,154,152,141,164,131,152,152,161,143,143,  
139,131,125,145,140,163)
```

Scatter Plot

Example

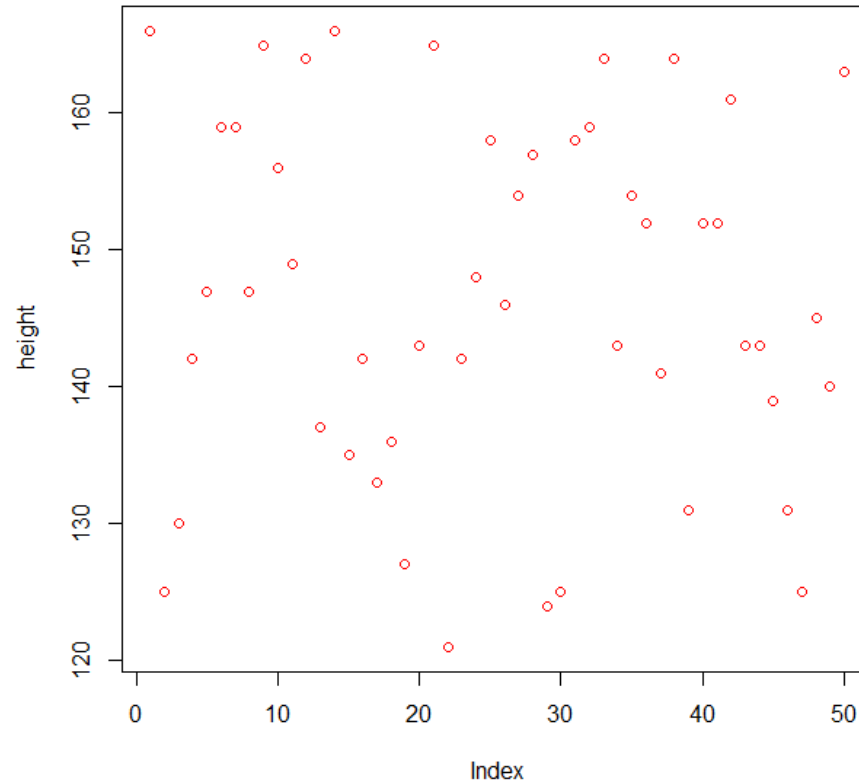
`plot(height)`



Scatter Plot

Example

```
plot(height, col = "red")
```



Bar plots:

Visualize the relative or absolute frequencies of observed values of a variable.

Used for categorical variables only.

It consists of one bar for each category.

The height of each bar is determined by either the absolute frequency or the relative frequency of the respective category and is shown on the *y-axis*.

Bar plots:

Visualize the relative or absolute frequencies of observed values of a variable.

```
barplot(x, width = 1, space = NULL,...)
```

Bar plot with absolute frequencies

```
barplot(table(x)) # Absolute frequencies
```

Bar plot with relative frequencies

```
barplot(table(x)/length(x))
```

Bar plots:

```
> help("barplot")
```

```
barplot(height, width = 1, space = NULL,  
names.arg = NULL, legend.text = NULL, beside  
= FALSE, horiz = FALSE, density = NULL, angle  
= 45, col = NULL, border = par("fg"), main =  
NULL, sub = NULL, xlab = NULL, ylab = NULL,  
xlim = NULL, ylim = NULL, xpd = TRUE, log =  
"", axes = TRUE, axisnames = TRUE, cex.axis =  
par("cex.axis"), cex.names = par("cex.axis"),  
inside = TRUE, plot = TRUE, axis.lty = 0,  
offset = 0, add = FALSE, args.legend = NULL,  
...)
```

Bar plots:

Example:

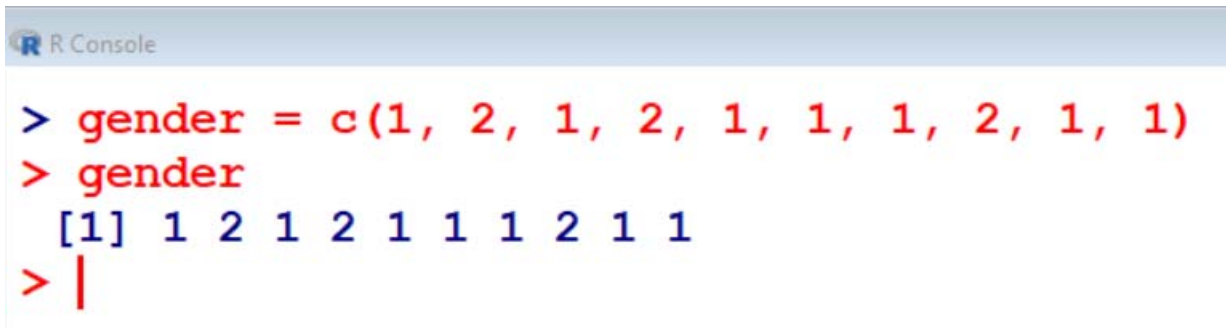
Code the 10 persons by using, say 1 for male (M) and 2 for female (F).

M, F, M, F, M, M, M, F, M, M
1, 2, 1, 2, 1, 1, 1, 2, 1, 1

```
> gender = c(1, 2, 1, 2, 1, 1, 1, 2, 1, 1)
```

```
> gender
```

```
[1] 1 2 1 2 1 1 1 2 1 1
```



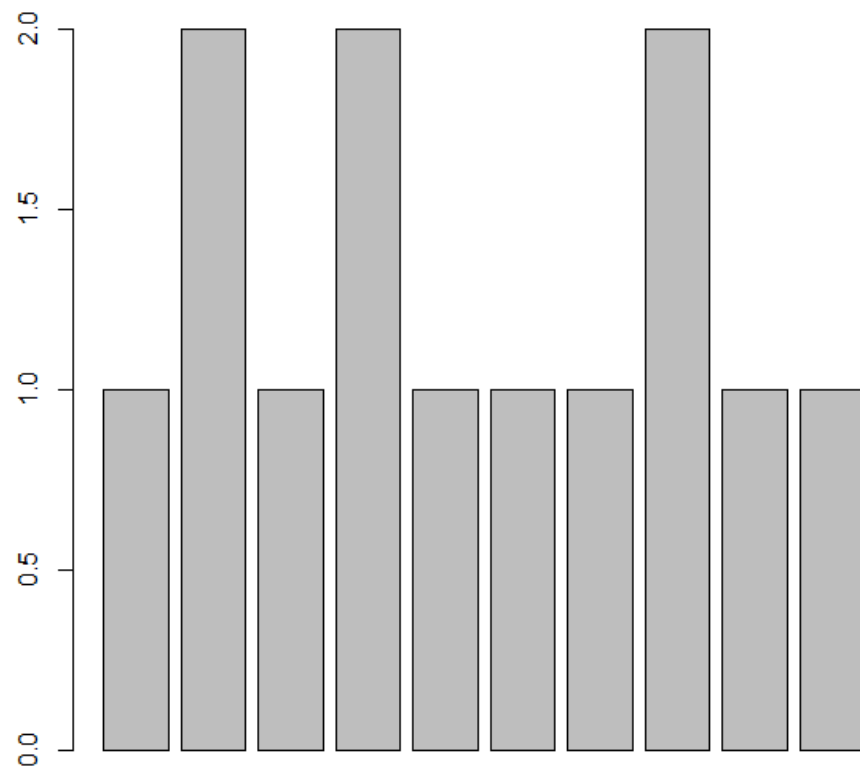
```
R Console  
> gender = c(1, 2, 1, 2, 1, 1, 1, 2, 1, 1)  
> gender  
[1] 1 2 1 2 1 1 1 2 1 1  
> |
```

Bar plots:

Example:

```
> barplot(gender)
```

Do you want this?



Bar plots:

Example:

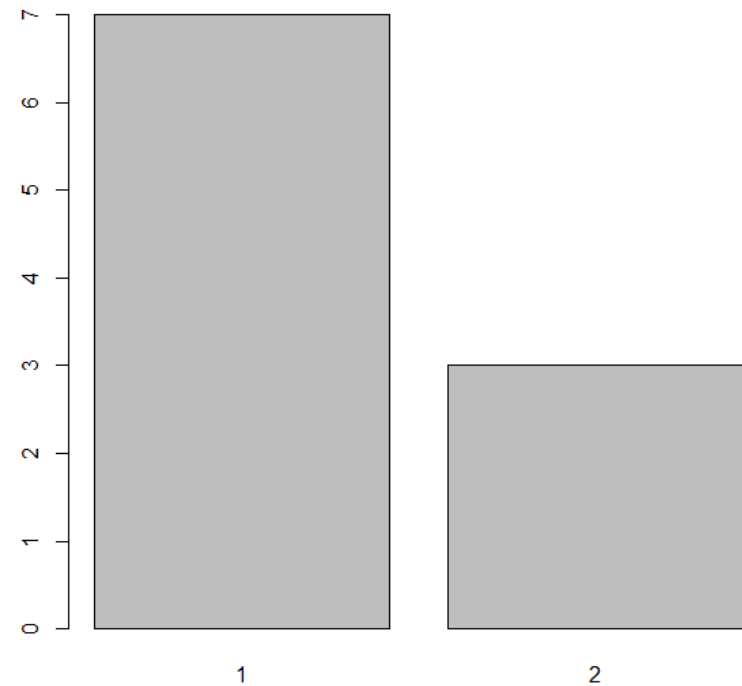
```
> table(gender)
```

```
gender
```

```
1 2
```

```
7 3
```

```
> barplot(table(gender))
```



Bar plots:

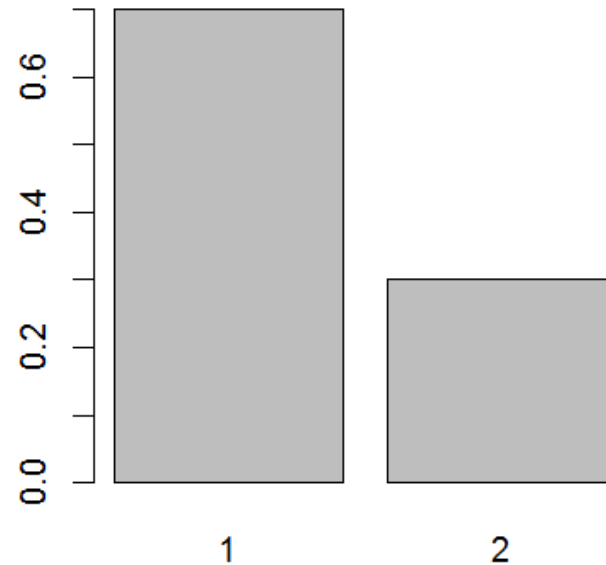
Example:

```
> table(gender)/length(gender)
```

```
gender
```

```
  1    2
```

```
0.7 0.3
```



```
> barplot(table(gender)/length(gender))
```

Bar plots:

Example:

Consider the following data on pizza home delivery. There are three branches (East - coded as 1, West - coded as 2, Central - coded as 3) of the restaurant.

The 100 values from code Directions are as follows:

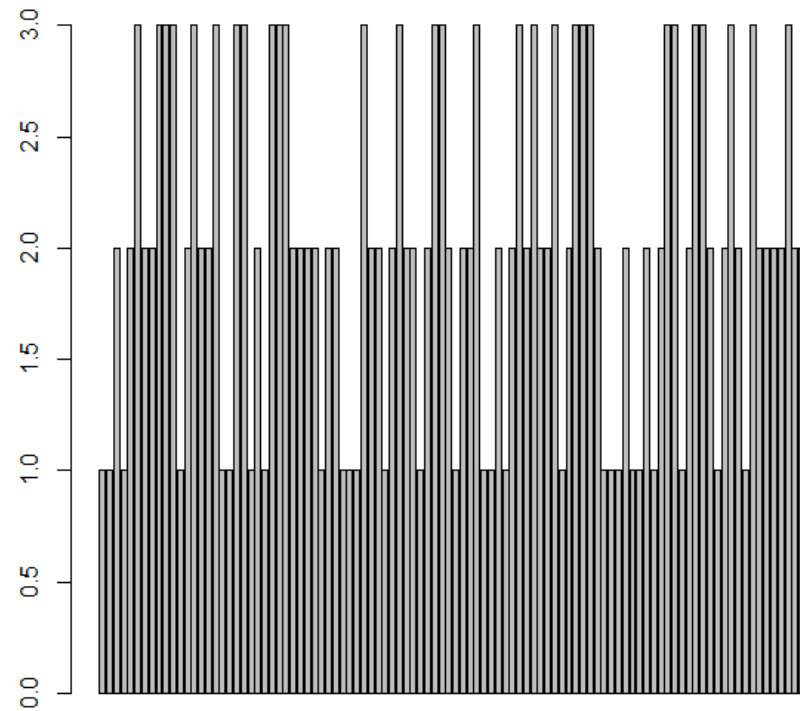
```
direction =  
c(1,1,2,1,2,3,2,2,3,3,3,1,2,3,2,2,3,1,1,3,3,1,2  
,1,3,3,3,2,2,2,2,1,2,2,1,1,1,3,2,2,1,2,3,2,2,1,  
2,3,3,2,1,2,2,3,1,1,2,1,2,3,2,3,2,2,3,1,2,3,3,3  
,2,1,1,1,2,1,1,2,1,2,3,3,1,2,3,3,2,1,2,3,2,1,3,  
2,2,2,2,3,2,2)
```

Bar plots:

Example:

`barplot(direction)`

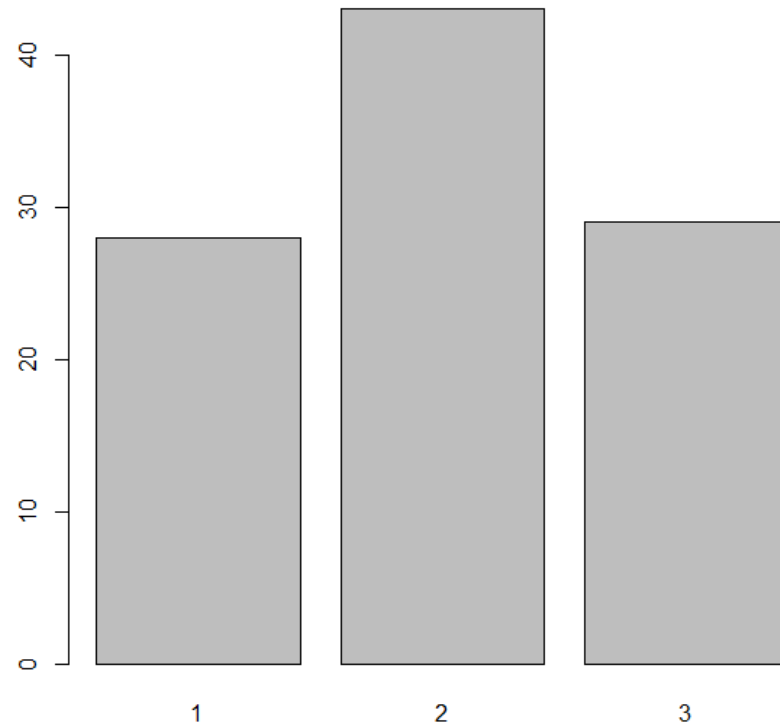
Do you want this?



Bar plots:

Example

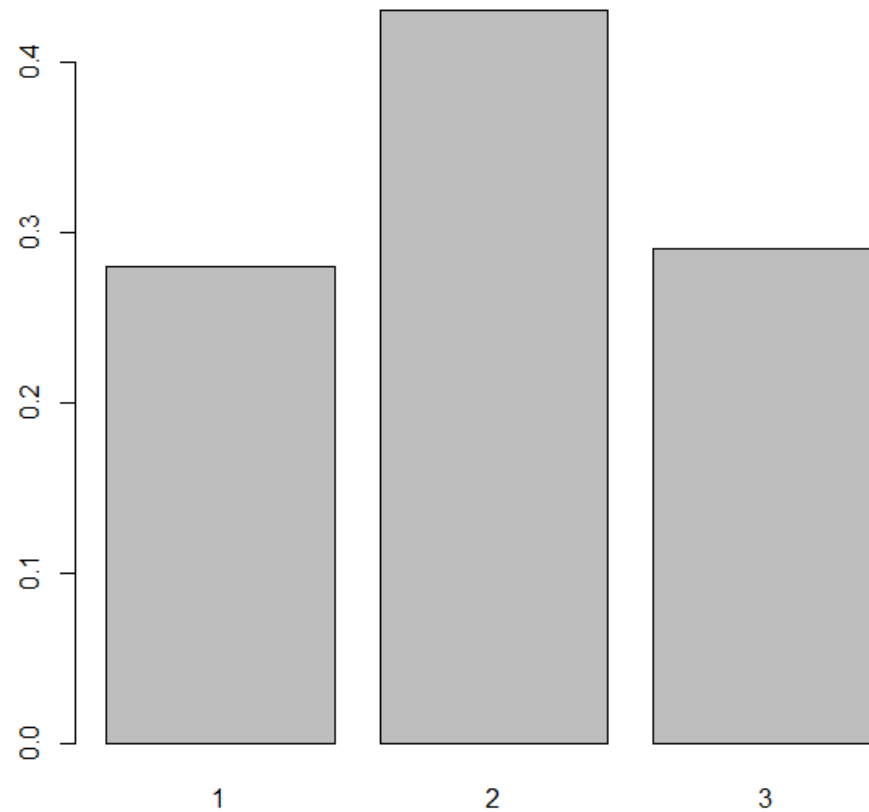
```
barplot(table(direction))
```



Bar plots:

Example

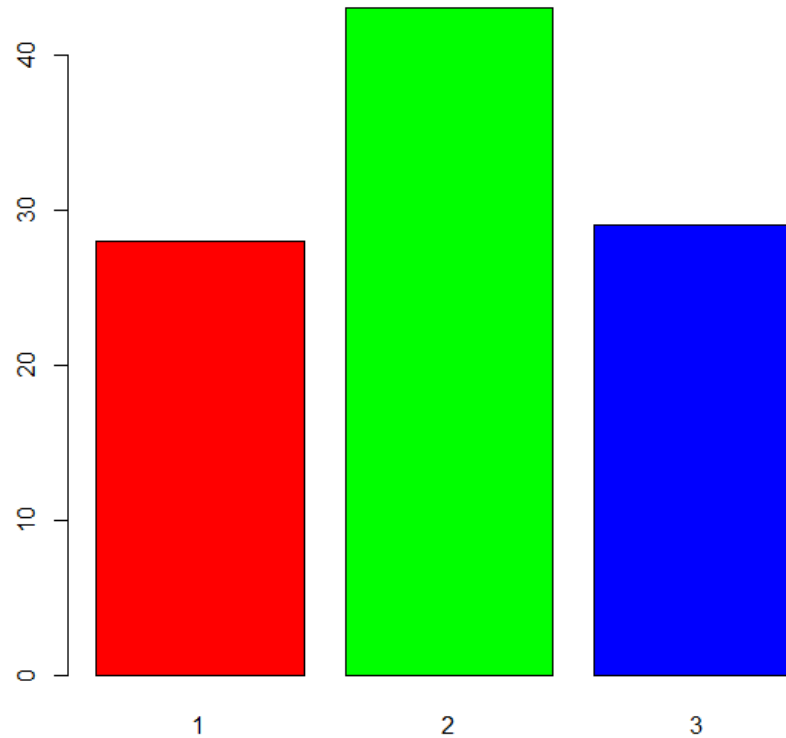
```
barplot(table(direction)/length(direction))
```



Bar plots:

Example: Adding colours

```
barplot(table(direction), col=c("red", "green",  
"blue"))
```



Bar plots:

Example: Adding title

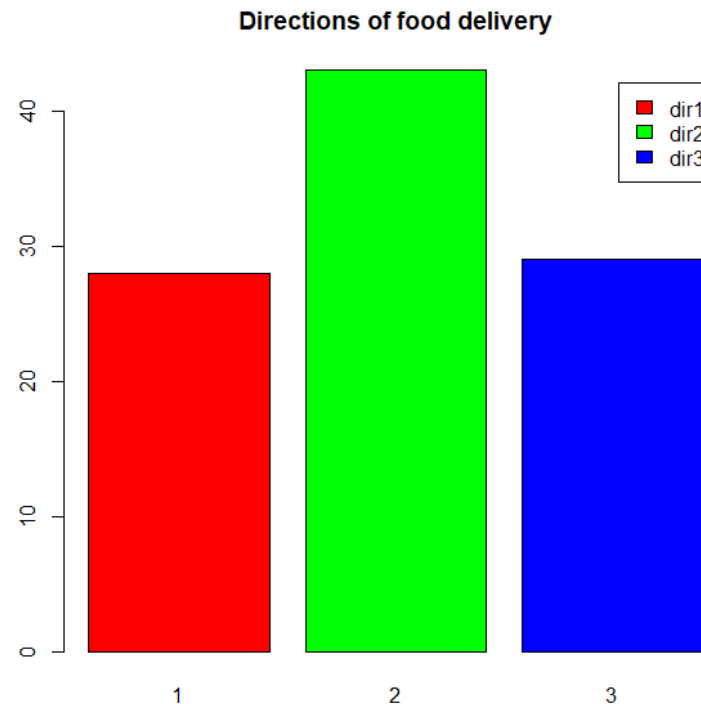
```
barplot(table(direction), col=c("red", "green",  
"blue"), main="Directions of food delivery" )
```



Bar plots:

Example: Adding legends

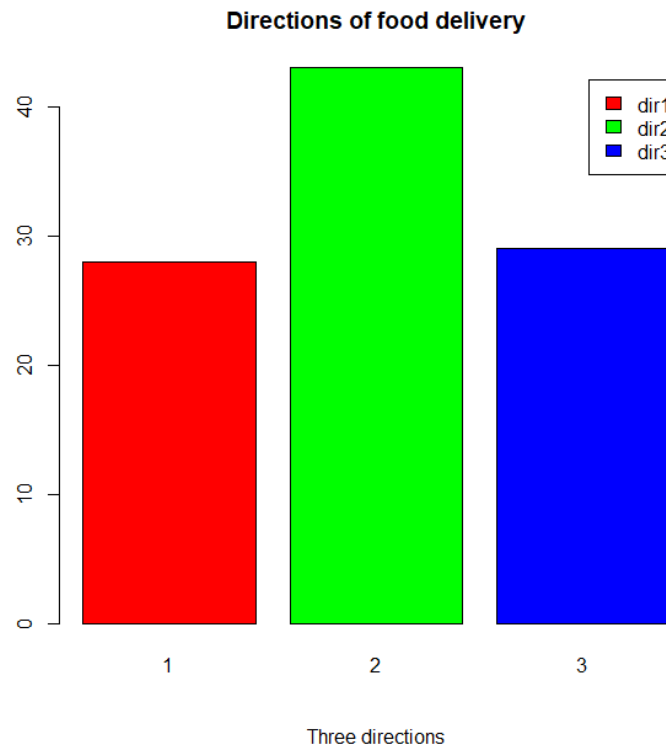
```
barplot(table(direction), col=c("red", "green",  
"blue"), main="Directions of food delivery",  
legend.text=c("dir1", "dir2", "dir3"))
```



Bar plots:

Example: Adding Subtitle

```
barplot(table(direction), col=c("red", "green",  
"blue"), main="Directions of food delivery",  
legend.text=c("dir1", "dir2", "dir3"),  
sub="Three directions" )
```



Bar plots:

Example: Adding Subtitle

```
barplot(table(direction), col=c("red", "green",  
"blue"), main="Directions of food delivery",  
legend.text=c("dir1", "dir2", "dir3"),  
sub="Three directions", xlab="Food Delivery  
Directions", ylab="Number of Deliveries" )
```

