Introduction to R Software

Swayam Prabha

Lecture 35

Graphics, Plots and Central Tendency of Data

Shalabh

Department of Mathematics and Statistics

Indian Institute of Technology Kanpur

Slides can be downloaded from

http://home.iitk.ac.in/~shalab/sp

Pie diagram:

Pie charts visualize the absolute and relative frequencies.

A pie chart is a circle partitioned into segments where each of the segments represents a category.

The size of each segment depends upon the relative frequency and is determined by the angle (frequency X 360^0).

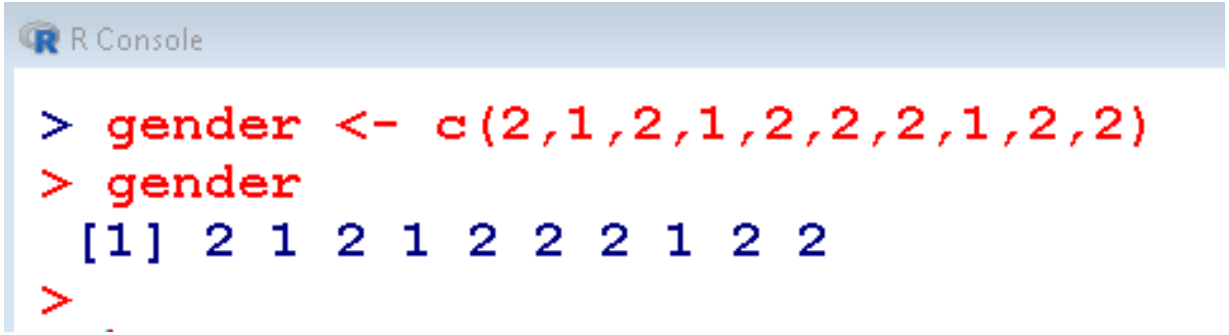
```
pie(x, labels = names(x), …)
```

Example:

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

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

```
> gender <- c(2,1,2,1,2,2,2,1,2,2)
> gender
 [1] 2 1 2 1 2 2 2 1 2 2
```



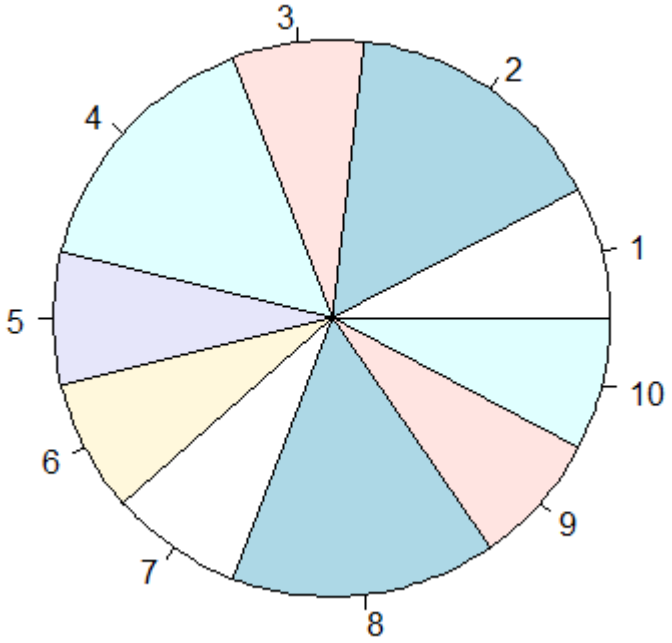
Pie diagram:

Example

```
> gender <- c(1, 2, 1, 2, 1, 1, 1, 2, 1, 1)
> gender
 [1] 1 2 1 2 1 1 1 2 1 1

> pie(gender)
```

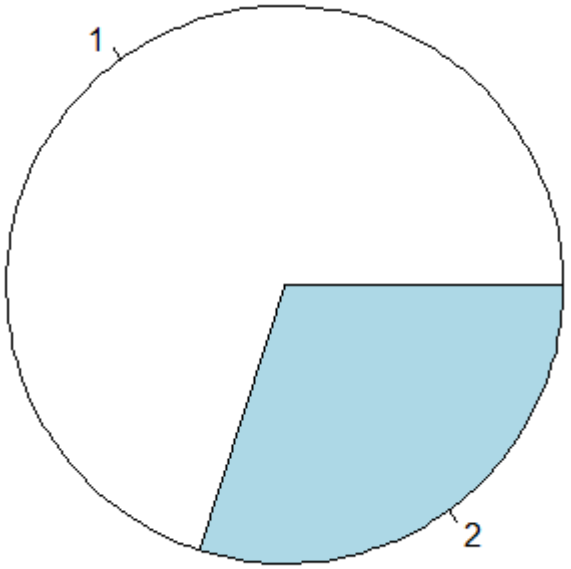
Do you want this?



Pie diagram:

Example

```
> pie(table(gender))
```



Example

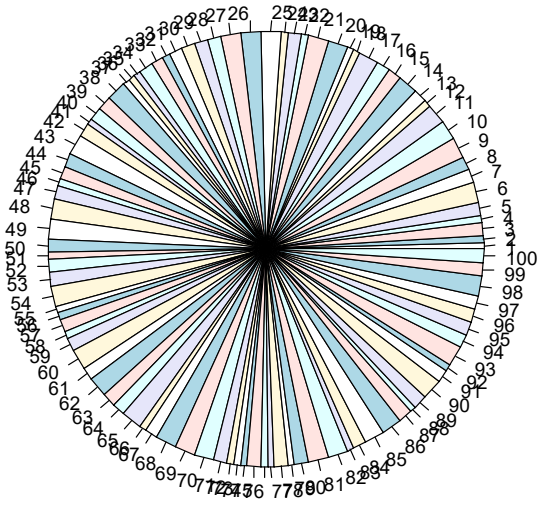
Consider a data set on home delivery of grocery items. The home delivery is centrally managed over phone and delivered by one of the three branches (East- denoted as 1, West- denoted as 2, Central- denoted as 3) of the shop and the 100 data values are recorded on the directions where the grocery items are delivered.

```
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)
```

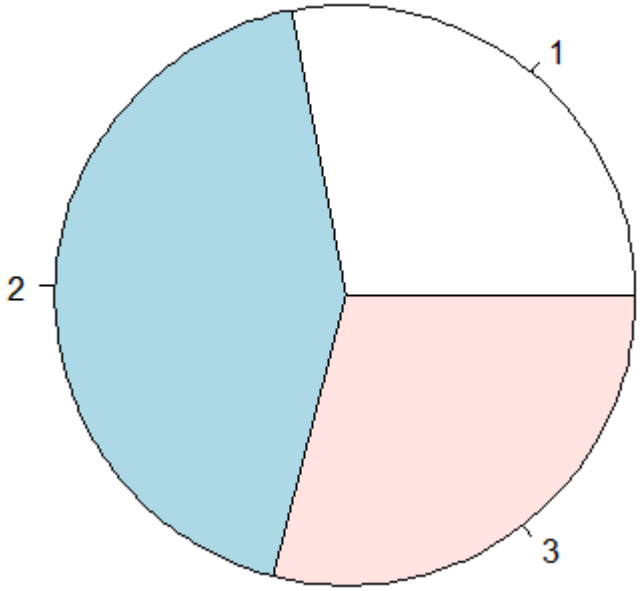
Pie diagram:

Example

```
> pie(direction)
```



```
> pie(table(direction))
```



Histogram:

Histogram is based on the idea to categorize the data into different groups and plot the bars for each category with height.

The area of the bars (= height X width) is proportional to the relative frequency.

So the widths of the bars need not necessarily to be the same

Histogram:

```
hist(x) # show absolute frequencies
hist(x, freq=F) # show relative frequencies
```

See `help("hist")` for more details

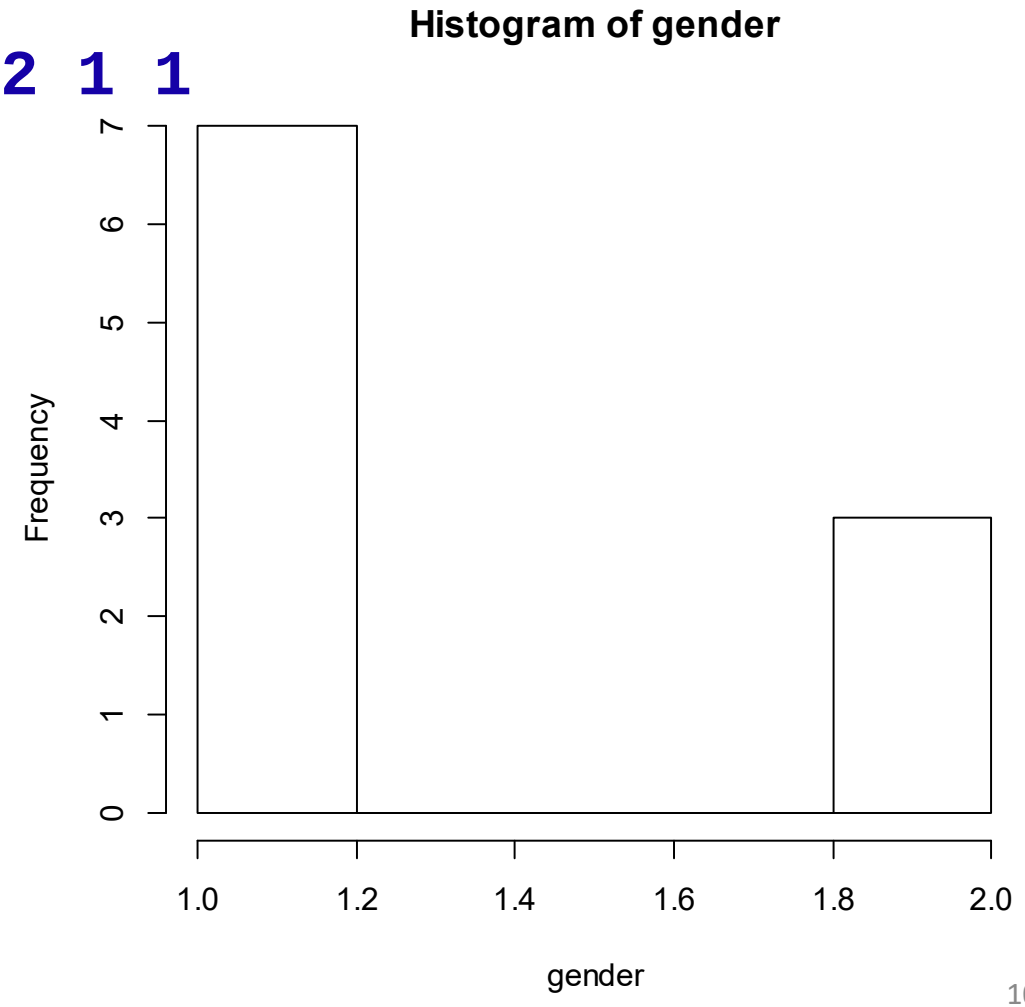
Histogram:

Example

```
> gender <- c(1, 2, 1, 2, 1, 1, 1, 2, 1, 1)
> gender
 [1] 1 2 1 2 1 1 1 2 1 1

> hist(gender)
```

What do you think?



Example

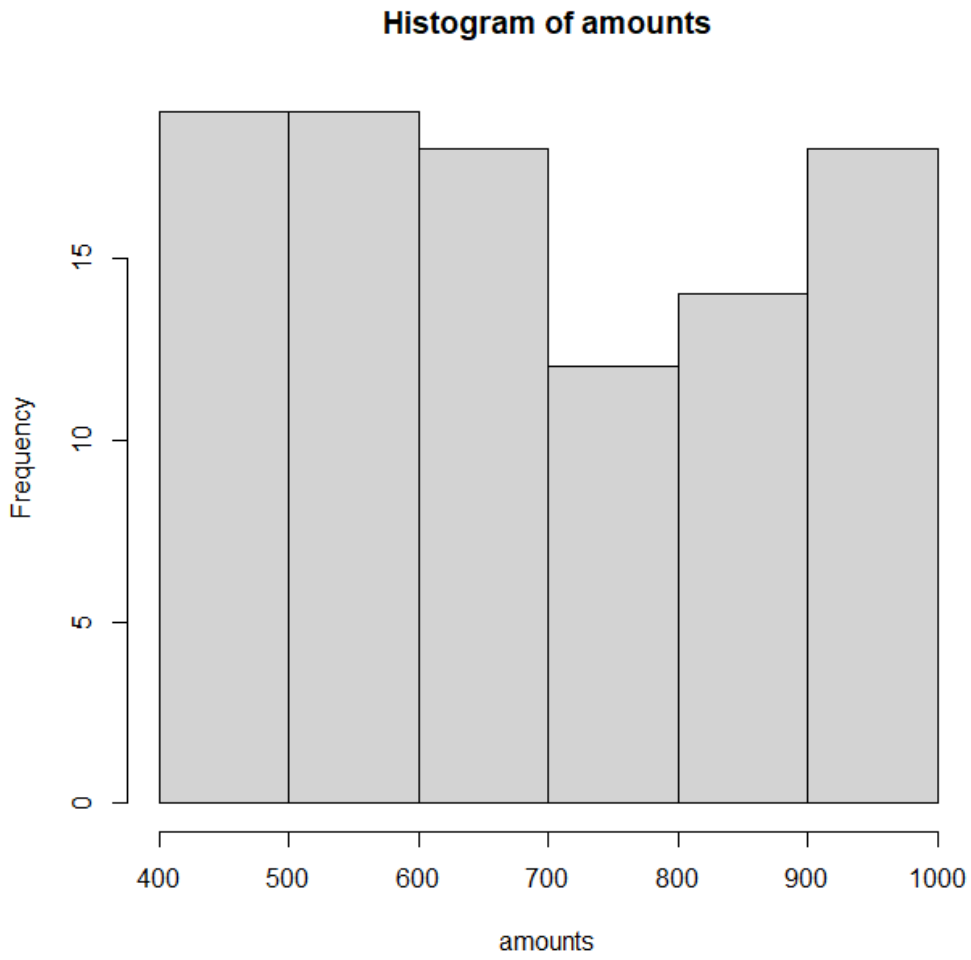
Consider a data set on home delivery of grocery items. Following are the amounts of 100 orders in INR:

```
amounts <-c(903, 491, 493, 949, 621, 578, 841,
696, 601, 906, 561, 665, 838, 770, 734, 819,
496, 590, 424, 577, 876, 908, 694, 517, 993,
558, 722, 763, 579, 797, 440, 678, 627, 982,
971, 981, 871, 987, 950, 486, 864, 545, 884,
595, 708, 935, 794, 975, 450, 415, 462, 543,
638, 873, 928, 526, 727, 652, 816, 997, 799,
902, 659, 606, 542, 441, 410, 446, 640, 620,
785, 411, 444, 422, 855, 868, 793, 964, 843,
560, 673, 552, 589, 676, 604, 955, 914, 850,
509, 709, 594, 487, 483, 443, 499, 857, 639,
597, 695, 565)
```

Histogram:

Example

```
> hist(amounts)
```



Descriptive statistics:

First hand tools which gives first hand information.

- **Central tendency of data (Mean, median, mode, geometric mean, harmoninc mean etc.)**

- **Variation in data (variance, standard deviation, standard error, mean deviation etc.)**