

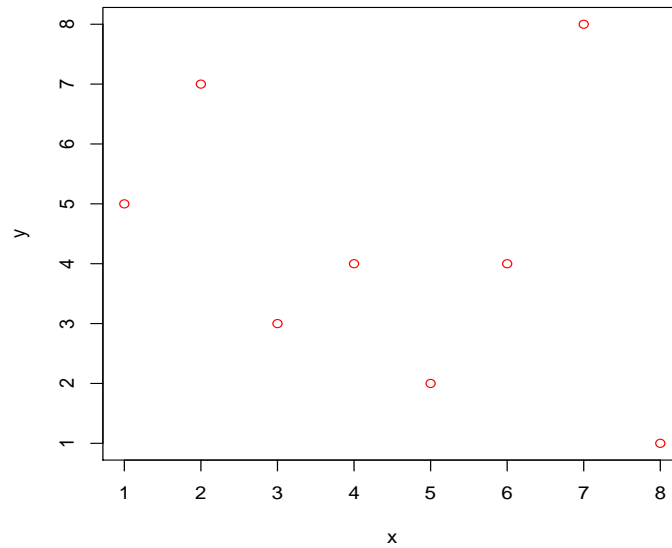
A Very Basic Introduction to R – Part II

Vectors

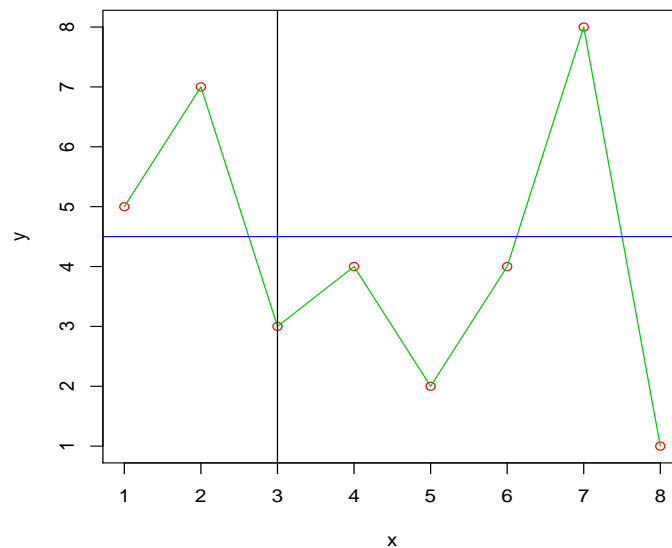
```
> y <- c(5, 7, 3, 4, 2, 4, 8, 1)
> max(y)
[1] 8
> min(y)
[1] 1
> which.min(y) # which element of y is the minimum?
[1] 8
> which.max(y)
[1] 7
> sort(y) # sort y in increasing order
[1] 1 2 3 4 4 5 7 8
> sort(y, decreasing=FALSE)
[1] 1 2 3 4 4 5 7 8
> y < 6
[1] TRUE FALSE TRUE TRUE TRUE TRUE FALSE TRUE
> y[y < 6] # list all elements smaller than 6
[1] 5 3 4 2 4 1
```

Basic Scatterplots

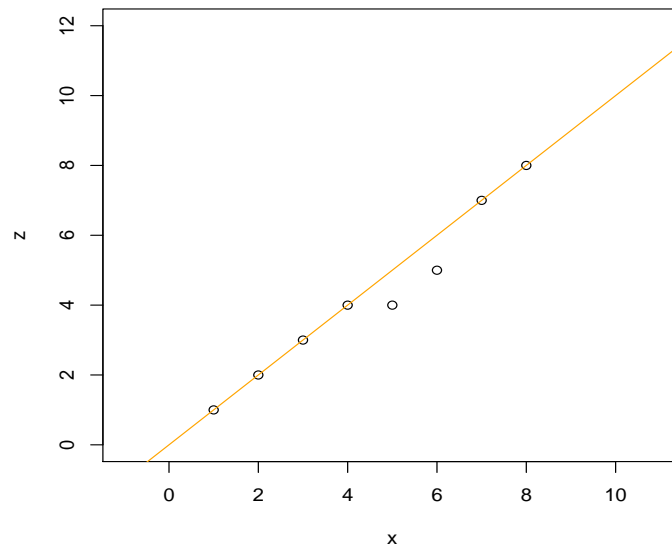
```
> x <- 1:8  
> plot(x, y, col="red") # plot y against x
```



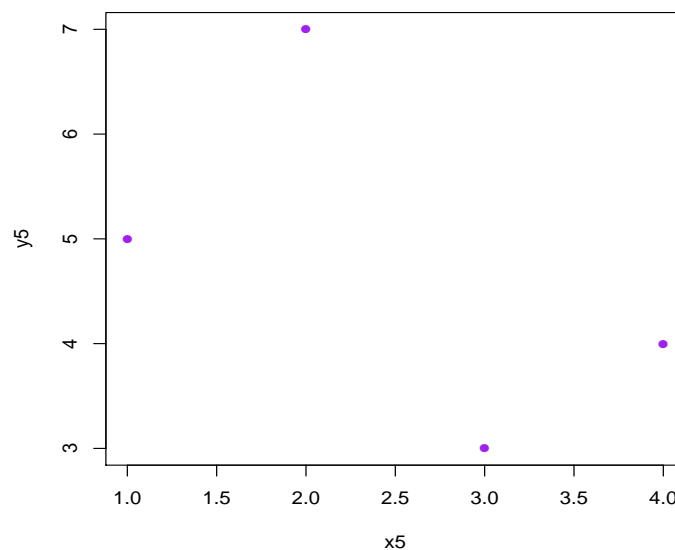
```
> plot(y ~ x, col=2) # plot y against x  
> lines(y ~ x, col=3) # add a broken line to the plot  
> abline(h=4.5, col=4) # add a horizontal line through x=4.5  
> abline(v=3, col=1) # add a vertical line through y=3
```



```
> z <- sort(y)
> # changing range of x and y axes:
> plot(z ~ x, ylim=c(0, 12), xlim=c(-1, 11))
> abline(0, 1, col="orange") # line of slope 1 and intercept 0
```



```
> x5 <- x[x < 5]
> y5 <- y[x < 5]
> # change plotting character to a dot:
> plot(y5 ~ x5, col="purple", pch=16)
```



Exercises

1. Assign the data 1, 4, 3, 7, 8, 15, 22, 18, 19 to a vector called z .
2. Find the maximum and minimum of z .
3. Which element is the maximum?
4. Sort z in increasing order.
5. Sort z in decreasing order.
6. Assign 1, 3, 5, 7, 2, 4, 6, 8, 9 to a vector called y .
7. Plot z against y , with z on the vertical axis and y on the horizontal axis. Re-do the plot using green plotting characters.
8. Overlay the plot with a red horizontal line through $z = 2$.
9. Overlay the plot with a blue line having intercept 3 and slope 1.5.
10. Assign 21, 3, 17, 9, 11 to x and 2, 5, 4, 5, 9 to the vector y .
11. Obtain a scatterplot of y against x , using red for the plotting characters.
12. Overlay the plot with a black line having intercept 11.5 and slope 0.3.
13. Assign the sorted values of x to z , and plot y against z , using yellow plotting characters.
14. Assign the elements of z that are larger than 3 to a vector called $z3$. Assign the corresponding elements of y to a vector called $y3$.
15. Plot $z3$ against $y3$, using a black dot as the plotting character.
16. Repeat the previous plot, but this time, ensure that the range of the vertical axis is from 0 through 25 and the range of the horizontal axis from -5 through 15.