1. BASICS

b) Plotting basics

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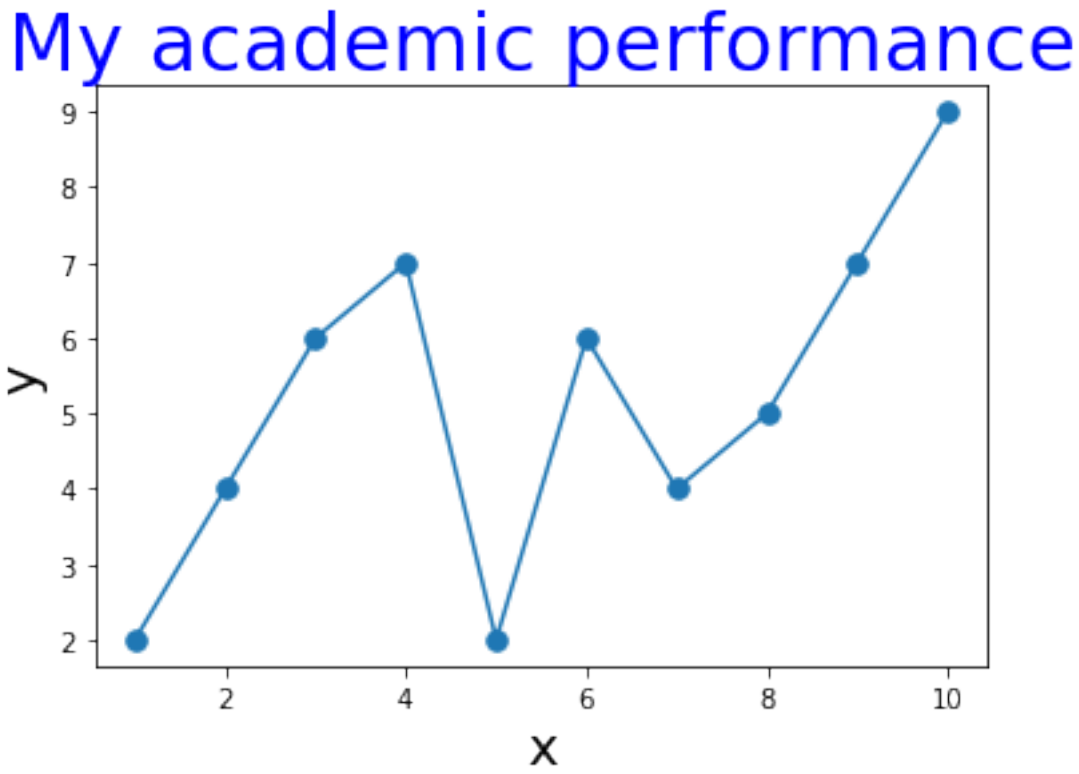
1 AIM

Plotting is one of the most essential tools in visualising data and results of our computations. Here, I will go through the basic forms of plotting, i.e. simple line graphs, scatterplots, bar graphs and histograms.

2 Simple line graph

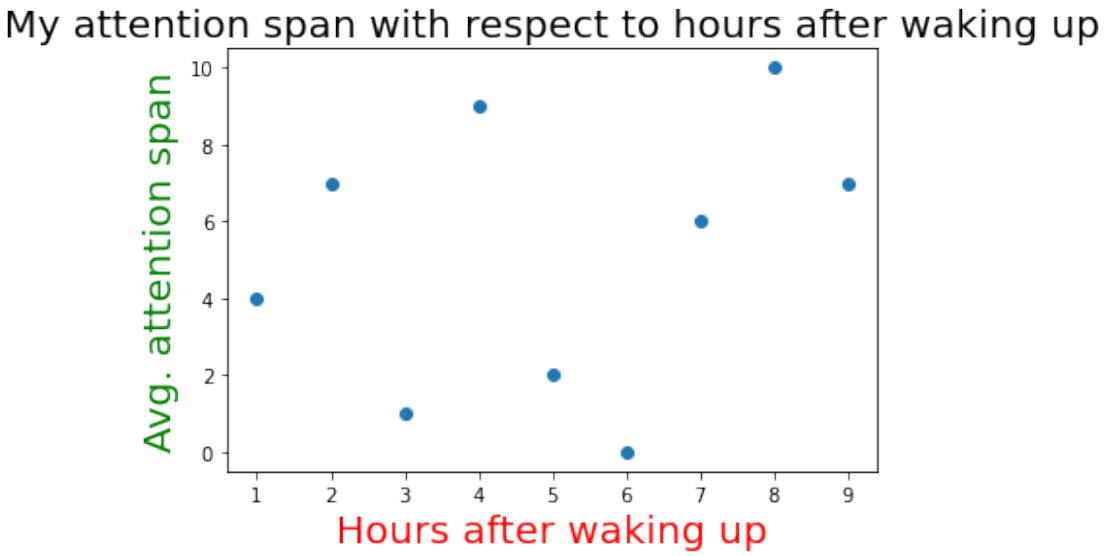
[51]:
```
from matplotlib.pyplot import scatter, plot, hist, xlabel, ylabel, title
from numpy import random
```

[55]:
```
x = range(1, 11)
y = [2, 4, 6, 7, 2, 6, 4, 5, 7, 9]
plot(x, y, marker = ".", markersize = 15)
xlabel("x", size = 20)
ylabel("y", size = 20)
title("My academic performance", size = 30, color = "blue")
None
```



3 Scatterplot

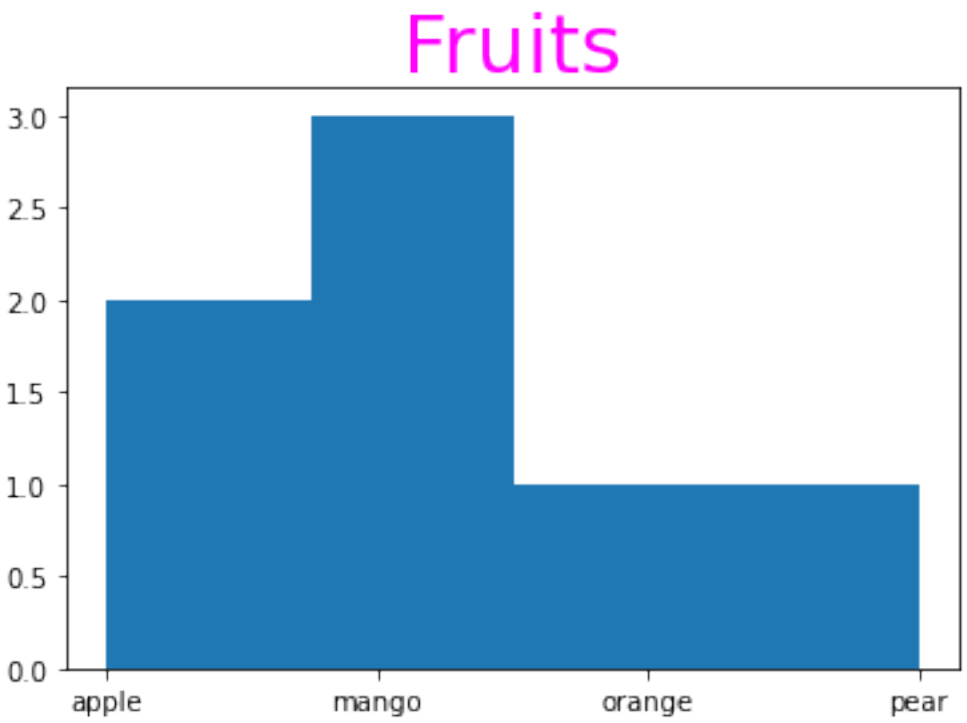
[68]:
```
x = range(1, 10)
y = [4, 7, 1, 9, 2, 0, 6, 10, 7]
scatter(x, y)
xlabel("Hours after waking up", size = 20, color = "red")
ylabel("Avg. attention span", size = 20, color = "green")
title("My attention span with respect to hours after waking up", size = "20")
None
```



4 Bar graph

While this is technically a histogram, its usage here is closer to that of a bar graph...

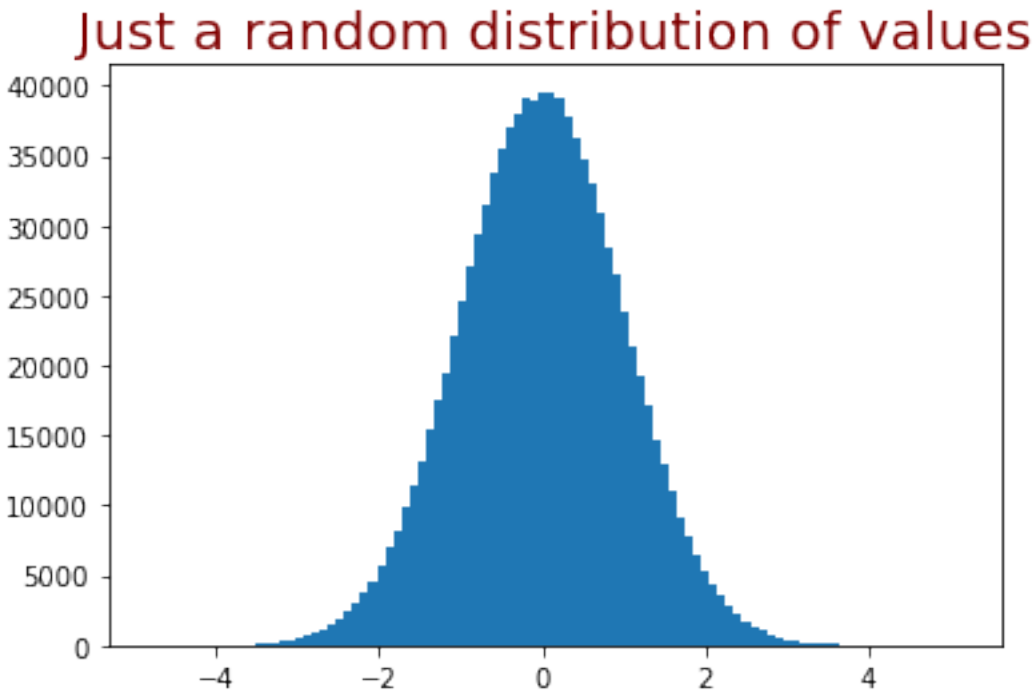
[69]:
```
# Histogram gives you the frequency of each value in the array
values = ["apple", "apple", "mango", "orange", "mango", "mango", "pear"]
hist(values, bins = 4)
# "bins" is the option for the number of different values you want to allow for
# Note that values are attached to frequencies
title("Fruits", size = "30", color = "magenta")
None
```



5 Histogram

Visualising a normally distributed random sample of numbers...

[66]:
```
x = range(1, 51)
# Creating a random normal distribution of some number of points
y = random.randn(1000000)
# As the number of points increases, the distribution becomes closer to the␣
 ↪normal curve
hist(y, bins = 100)
title("Just a random distribution of values", size = 20, color = "maroon")
None
```



6 CONCLUSION

Python provides a wide variety of plots and plotting options, and the demonstration here only showcases a limited number of these. Regardless, the above concepts will form the basis of our more advanced plotting assignments.