Exercise 0: Python Tutorials (you may use other programming language/tools of your choice)

a) In this task you have to write a word count program (using IPython). Your program should read a text document. You should save your session and it should include Headings and comments at some important steps to explain the working of code.

In [ ]:
```
#Input: Required File
file="text.txt"

wordCount=0
#Counting Words
with open(file,'r') as file:
    for line in file:
        #Increment the wordCount variable by 1 for each word detected
        wordCount=(wordCount + len(line.split()))

#Output: Word Count
print("There are total ",wordCount," Number of Words in the given file.")
```

```
There are total  91  Number of Words in the given file.
```

b) Create a matrix A of dimensions n × m, where n = 100 and m = 20. Initialize Matrix A. Create a vector v of dimension m × 1. Initialize the matrix with a random values and vector with normal distribution using μ = 2 and σ = 0.01 (use numpy).

In [ ]:
```
import numpy as np
import matplotlib.pyplot as plt

#Input: Number of Rows and Columns of Matrix
rows = int(input("Enter the number of rows: "))
cols = int(input("\nEnter the number of columns: "))

A = np.random.randint(low = 1, high = 100, size = (rows,cols))
V = np.random.normal(loc = 2.0, scale = 0.01, size = (cols,1))

#Storing Elementwise Multiplication of Matrix A and Vector V in Vector C
C = A.dot(V)

#Output: The Resultant Vector, its Mean, Standard Deviation and the Histo
print("\nThe Resultant Vector is:\n",C,"\n")
print("The Mean of the Resultant Vector = ",np.mean(C))
print("\nThe Standard Deviation of the Resultant Vector = ",np.std(C))
plt.style.use('seaborn-whitegrid')
print("\nThe Histogram for the Vector C is as follow:\n", plt.hist(C, bin
plt.show()
```

```
The Resultant Vector is:
 [[201981.98028119]
 [198540.91552939]
 [203819.08276216]
 ...
 [200600.87322011]
 [201552.08421756]
 [198354.38651345]]

The Mean of the Resultant Vector =  200024.91272434662

The Standard Deviation of the Resultant Vector =  2559.281525471748

The Histogram for the Vector C is as follow:
 (array([ 111., 2545., 5912., 1397.,   35.]), array([189943.29838214, 19
4198.75336162, 198454.2083411 , 202709.66332058,
       206965.11830006, 211220.57327954]), <BarContainer object of 5 art
ists>)
```

```
/tmp/ipykernel_4850/1600338010.py:18: MatplotlibDeprecationWarning: The
seaborn styles shipped by Matplotlib are deprecated since 3.6, as they n
o longer correspond to the styles shipped by seaborn. However, they will
remain available as 'seaborn-v0_8-<style>'. Alternatively, directly use
the seaborn API instead.
  plt.style.use('seaborn-whitegrid')
```