**INSTALLASION DES LIBRAIRIES (NUMPY,SCIPY ET MATPLOTLIB)**



**EXO1 (Algebre lineaire):**

import numpy as np

import numpy.linalg as nl

A = np.random.rand(3,3)

b = np.array([3.,4.,5.],float)

Aprime=A.transpose()

r = np.ndim(A)

Ainv = nl.inv(A)

x = nl.solve(A,b) nl.eig(A)

n1 = nl.norm(A,np.inf) ; n2 = nl.norm(A,−np.inf ) ;

n2 = nl.norm(A,− np.inf ) ;

n3 = n1 = nl.norm (A,2) ;

n4 = n1 = nl.norm(A,'fro' ) ;

print(A)

print(b)

print (Aprime)

print (Ainv)

print (x)

print (n1)

print(n3)

print(n4)

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**EXO2 (Les intégrales):**

from scipy.integrate import simps

from numpy import trapz

import numpy as np

def function(x):

return x\*\*2

x = np.arange(1,10,0.1)

y = function(x)

print x

print y

# Methode trapeze:

area = trapz(y,x)

print 'area: ',area

# Methode Simpson:

area = simps(y,x)

print 'area: ',area

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**EXO3 (Les courbes):**

import matplotlib.pyplot as plt import numpy as np

t1= np.linspace(1 ,5 ,10)

t2=np.linspace(1 ,5 ,20)

plt.plot( t1 , t1 , 'r--' , t1 , t1\*\*2 , 'bs ' , t2 , np.log(t2)\*\*3,'g^-' )

plt.xlabel(" Abcisses ")

plt.ylabel('fonctions')

plt.legend([' courbe 1' , ' courbe 2 ' , ' courbe 3 ' ] , loc='best' )

plt.title( "Zoulies courbes" )

plt.show()

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**EXO4 (MATRICES):**

import numpy as np

A = np.random.rand(3,3)

B=np.diag([1.,2.,3.])

v = np.array([3.,4.,5.],float)

C1 = A+B

C2 = 2.+A

D1 = 2\*A

D2 = B\*\*3

D3 = A\*B

D4 = np.dot(A,B)

D5 = np.dot(A,v)

print(C1)