In [11]:
```
#возьмём распределение Парето с параметром k = 5, тогда заданное условие на момент

import numpy
import random
import matplotlib.pyplot as plt
%matplotlib inline

k = 5
N = 10**4
Arr = []
for i in range (N):
    Arr += [numpy.random.pareto(k)]
h = []
for i in range (N):
    h += [0]



def plot(n):
    x = range(n)
    Y = []
    for i in range(n):
         Y += [countDencity(i)]
    plt.plot(x, Y, color = 'm', label = "density graph N = " + str(n))

    plt.plot(Arr, h, color = 'b', label  = "sample")


    legend = plt.legend(loc='upper center', shadow=True, fontsize='x-large')
    legend.get_frame().set_facecolor('#00FFCC')
    plt.ylim(0, 0.01)
    plt.show()


def countDencity(n):
    if n <= 0:
        return 0
    else:
        return k/n**(k+1)


def countS1(n,s1, arr):
    s1 += arr[n]
    return s1

def countS2(n, s2, arr):
    s2 += arr[n]**2
    return s2

def countRealDispersion(n, s1, s2, arr):
    return (s2 / (n+1) - s1**2 / (n+1)**2)

def countTeorDispersion():
    return (1/(k - 1)**2 * k / (k-2))

def plotDispersion(n, arr):
    x = range(n)
    S1 = 0
    S2 = 0
    Y = []
    disp =  countTeorDispersion()
    for i in range(n):
```