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from math import *
Alphabet = 'ABCDEFGHIJKLMNOPQRSTUVWXYZ'
def crypt(message,u0,a = 4, x1=0.2, x2= 0.8):
    u = u0
    code = []
    i = 0
    for k in range(len(message)):
        if message[k] in Alphabet:
            vieuxi = i
            i=i+1
            u= a*u*(1-u)
            inter = Alphabet.index(message[k])
            while ( u< (inter *(x2-x1)/26)+ x1 or u>((inter+1)*(x2-x1)/26)+x1):
                i+=1
                u = a*u*(1-u)
            code += [i-vieuxi]
    return(code)

def cryptbis(message,u0,a = 4, x1=0.2, x2= 0.8):
    u = u0
    code = []
    i = 0
    for k in range(len(message)):
        if message[k] in Alphabet:
            vieuxi = i
            i=i+1
            u= a*u*(1-u)
            inter = Alphabet.index(message[k])
            while i - vieuxi < 60 or( u< (inter *(x2-x1)/26)+ x1 or u>((inter+1)*(x2-
x1)/26)+x1):
                i+=1
                u = a*u*(1-u)
            code += [i-vieuxi]
    return(code)

def decrypt(code,u0,a = 4, x1=0.2, x2= 0.8):
    u = u0
    i = 0
    sortie=''
    for j in range(0,len(code)):
        for i in range(int(code[j])):
            u = a*u*(1-u)
            n = floor(26*(u-x1)/(x2-x1))
            print(u)
            sortie += Alphabet[n]
    return sortie

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