

Correction TP noté 2016/2017

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from random import *

# Exo 1

def couleur(N):
    if (N%2==0 and N>10):
        return "rouge"
    elif (N%2==1 and N<=25):
        return "vert"
    else:
        return "bleu"

# Exo 2

def polynome(n):
    return n*(4*n*n-1)/3

def sci(n):
    res=0
    for i in range(1,n+1):
        res+=(2*i-1)**2
    return res

def test_formule(N):
    res=True
    for i in range(1,N+1):
        if polynome(i)!=sci(i):
            res=False
    return res

# Exo 3

def compte(chaine, char):
    cpt=0
    for x in chaine:
        if x==char:
            cpt+=1
    return cpt

def frequence(chaine):
    return [compte(chaine, 'a')/len(chaine),
            compte(chaine, 'b')/len(chaine),
            compte(chaine, 'c')/len(chaine),
            compte(chaine, 'd')/len(chaine)]

# Exo 4

def genere_char(L):
    x=randrange(100)
    if x<L[0]:
        return 'a'
    elif x<L[0]+L[1]:
        return 'b'
    elif x<L[0]+L[1]+L[2]:
        return 'c'
    else:
        return 'd'

def genere(N,L):
    t=""
    for i in range(N):
        t+=genere_char(L)
    return t

# Exo 5

def code(texte, L):
    new=""
    for char in texte:
        if char=='a':
            new+=L[0]
        elif (char=='b'):
            new+=L[1]
        elif (char=='c'):
            new+=L[2]
        elif (char == 'd'):
            new+=L[3]
    return new

def decode(codage):
    res=""
    texte=codage
```

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while (texte!=""):
    if texte[0]=='0':
        res+='a'
        texte=texte[1:]
    elif (texte[0:3]=='100'):
        res+='b'
        texte=texte[3:]
    elif (texte[0:3] == '101'):
        res+='c'
        texte = texte[3:]
    elif (texte[0:3] == '110'):
        res+='d'
        texte=texte[3:]
    else:
        return False
return res
```