Ejercicios con bucles PROJECT EULER - 22-10-2017

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0.1 Algunos ejercicios de bucles con primos - 22-10-2017 - Alejandro Santorum Varela

EJERCICIO 1 - Existen enteros, por ejemplo 145, que son iguales a la suma de los factoriales de sus dígitos. Determina todos los enteros con esta propiedad.

```
In [1]: for n in srange(1, 1000000):
            L = n.digits()
            l = len(L)
            a=0
            for i in xsrange (0,l):
                a += factorial(L[i])

            if n==a:
                print(n)
```

```
1
2
145
40585
```

EJERCICIO 2(Project Euler) - Each new term in the Fibonacci sequence is generated by adding the previous two terms. By starting with 1 and 2, the first 10 terms will be:

1, 2, 3, 5, 8, 13, 21, 34, 55, 89, ...

By considering the terms in the Fibonacci sequence whose values do not exceed four million, find the sum of the even-valued terms.

```
In [2]: a = 0
        i=0
        total = 0
        while 1:
            a = fibonacci(i)
            if a>4000000:
                break

            if is_even(a):
                total += a
            i = i+1
```

```
        print("Result: "+str(total))
```

```
Result: 4613732
```

EJERCICIO 4(Project Euler) - A palindromic number reads the same both ways. The largest palindrome made from the product of two 2-digit numbers is 9009 = 91 Œ 99.

Find the largest palindrome made from the product of two 3-digit numbers.

```
In [3]: LR = list()

        for i in xsrange(100, 1000):
            for j in xsrange(100, 1000):
                a = i*j  #calculamos número a evaluar si es un palíndromo o no

                L = a.digits()
                LL=list(L)
                LL.reverse()
                flag = 0
                l=len(L)
                for k in xsrange(0, l):
                    if L[k] != LL[k]:
                        flag = 1
                        break

                if flag == 0:
                    LR.append(a)

        ll = len(LR)
        maximo = 0
        for m in xsrange(0, ll):
            if maximo < LR[m]:
                maximo = LR[m]

        print("Palíndromo más grande que cumpla los requisitos pedidos:"+str(maximo))
        print(" ")
```

```
Palíndromo más grande que cumpla los requisitos pedidos:906609
```

EJERCICIO 421(Proyect Euler) - Numbers of the form n15+1 are composite for every integer n > 1. For positive integers n and m let s(n,m) be defined as the sum of the distinct prime factors of n15+1 not exceeding m.

E.g. 215+1 = 3Œ3Œ11Œ331. So s(2,10) = 3 and s(2,1000) = 3+11+331 = 345.

Also 1015+1 = 7Œ11Œ13Œ211Œ241Œ2161Œ9091. So s(10,100) = 31 and s(10,1000) = 483. Find s(n,108) for 1 n 1011.

```
In [4]: def s(n, tope):                    #Función s(n,m) definida en ProjectEuler
            nn = n^15+1
            L = list(nn.factor())
            l = len(L)
            LL = list()
            for i in xsrange(0, l):
                a = L[i][0]
                if a <= tope:
                    LL.append(a)
                elif a > tope:
                    break

            ll=len(LL)
            suma=0
            for j in xsrange(0, ll):
                suma += LL[j]
            return suma


        #Lo que se pide calcular en ProjectEuler es demasiado grande. La solución de abajo es

        total = 0
        for n in xsrange(1, 1001):
            total += s(n, 100)

        print("Resultado:"+str(total))
```

```
Resultado:82359
```