Práctica 0: vectorización

Alberto Díaz

Pedro Antonio González Calero

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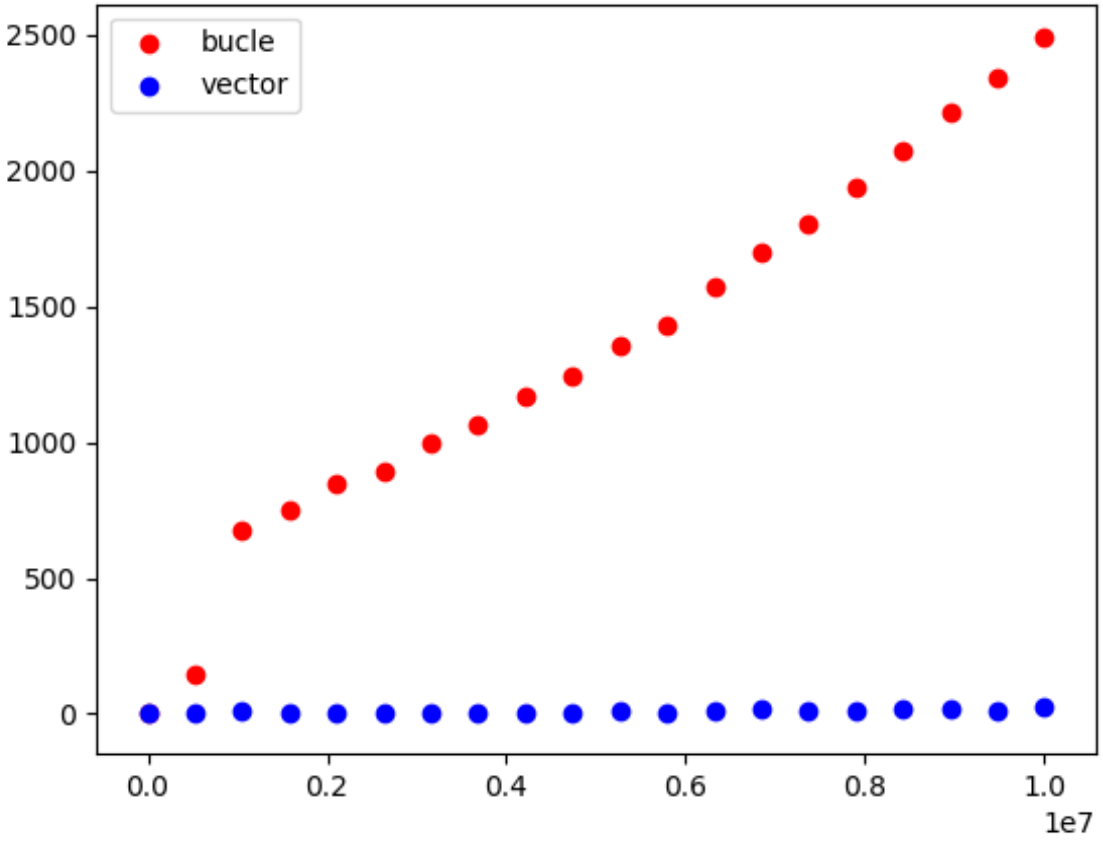
Vectorización

```
import time
import numpy as np


def dot_product(x1, x2):
    """Calcula el producto escalar con un bucle"""
    dot = 0
    for i in range(len(x1)):
        dot += x1[i] * x2[i]
    return dot


def fast_dot_product(x1, x2):
    """Calcula el producto escalar vectorizado"""
    dot = np.dot(x1, x2)
    return dot
```

Vectorización

```
import matplotlib.pyplot as plt


def compara_tiempos_dot():
    sizes = np.linspace(100, 10000000, 20)

    times_dot = []
    times_fast_dot = []

    for size in sizes:
        x1 = np.random.uniform(1, 100, int(size))
        x2 = np.random.uniform(1, 100, int(size))

        tic = time.process_time()
        dot = dot_product(x1, x2)
        toc = time.process_time()
        times_dot += [1000 * (toc - tic)]

        tic = time.process_time()
        fast_dot = fast_dot_product(x1, x2)
        toc = time.process_time()
        times_fast_dot += [1000 * (toc - tic)]


    plt.figure()
    plt.scatter(sizes, times_dot, c='red', label='bucle')
    plt.scatter(sizes, times_fast_dot, c='blue', label='vector')
    plt.legend()
    plt.savefig('compara tiempos dot.png')
```

Vectorización



Práctica 0: Pista cálculo vectorizado

```
import numpy as np

a = np.array([1,2,3,4,5])
b = np.array([3,3,3,3,3])

a < b
Out[6]: array([ True, True, False, False, False])

In [7]: sum(a < b)
Out[7]: 2
```