

```
java -Xint p11.Vector4 1
```

| N        | T   |
|----------|-----|
| 10000    | 1   |
| 20000    | 0   |
| 40000    | 0   |
| 80000    | 1   |
| 160000   | 1   |
| 320000   | 3   |
| 640000   | 5   |
| 1280000  | 11  |
| 2560000  | 22  |
| 5120000  | 45  |
| 10240000 | 87  |
| 20480000 | 175 |
| 40960000 | 357 |
| 81920000 | 695 |

```
java -Xint p11.Vector4 10
```

| N        | T    |
|----------|------|
| 10000    | 1    |
| 20000    | 1    |
| 40000    | 4    |
| 80000    | 7    |
| 160000   | 13   |
| 320000   | 28   |
| 640000   | 57   |
| 1280000  | 111  |
| 2560000  | 220  |
| 5120000  | 440  |
| 10240000 | 884  |
| 20480000 | 1750 |
| 40960000 | 3510 |
| 81920000 | 7023 |

java -Xint p11.Vector4 100

| N        | T     |
|----------|-------|
| 10000    | 9     |
| 20000    | 17    |
| 40000    | 35    |
| 80000    | 68    |
| 160000   | 134   |
| 320000   | 274   |
| 640000   | 547   |
| 1280000  | 1086  |
| 2560000  | 2201  |
| 5120000  | 4357  |
| 10240000 | 8652  |
| 20480000 | 17455 |
| 40960000 | 34872 |
| 81920000 | 69908 |

java -Xint p11.Vector4 1000

| N        | T      |
|----------|--------|
| 10000    | 85     |
| 20000    | 168    |
| 40000    | 334    |
| 80000    | 678    |
| 160000   | 1359   |
| 320000   | 2705   |
| 640000   | 5477   |
| 1280000  | 10946  |
| 2560000  | 21658  |
| 5120000  | 44104  |
| 10240000 | 87495  |
| 20480000 | 172186 |
| 40960000 | 349995 |
| 81920000 | 697507 |

```
java -Xint p11.Vector4 100000
```

| N        | T        |
|----------|----------|
| 10000    | 8326     |
| 20000    | 17398    |
| 40000    | 34513    |
| 80000    | 68993    |
| 160000   | 137210   |
| 320000   | 270531   |
| 640000   | 547811   |
| 1280000  | 1094734  |
| 2560000  | 2165845  |
| 5120000  | 4410391  |
| 10240000 | 8749612  |
| 20480000 | 17218623 |
| 40960000 | 34999562 |
| 81920000 | 69750721 |

```
java -Xint p11.Vector5 10
```

| N        | T    |
|----------|------|
| 10000    | 1    |
| 20000    | 2    |
| 40000    | 4    |
| 80000    | 8    |
| 160000   | 16   |
| 320000   | 31   |
| 640000   | 63   |
| 1280000  | 120  |
| 2560000  | 238  |
| 5120000  | 490  |
| 10240000 | 949  |
| 20480000 | 1898 |
| 40960000 | 3816 |
| 81920000 | 7643 |

java -Xint p11.Vector6 1

| N        | T      |
|----------|--------|
| 10000    | 692    |
| 20000    | 2797   |
| 40000    | 11239  |
| 80000    | 45246  |
| 160000   | 182280 |
| 320000   | 734343 |
| 640000   | Fdt    |
| 1280000  | Fdt    |
| 2560000  | Fdt    |
| 5120000  | Fdt    |
| 10240000 | Fdt    |
| 20480000 | Fdt    |
| 40960000 | Fdt    |
| 81920000 | Fdt    |

java -Xint p11.Vector7 1

| N        | T   |
|----------|-----|
| 10000    | 0   |
| 20000    | 0   |
| 40000    | 0   |
| 80000    | 1   |
| 160000   | 2   |
| 320000   | 3   |
| 640000   | 6   |
| 1280000  | 13  |
| 2560000  | 24  |
| 5120000  | 48  |
| 10240000 | 99  |
| 20480000 | 194 |
| 40960000 | 385 |
| 81920000 | 761 |

java p11.Vector5 10

| N        | T   |
|----------|-----|
| 10000    | 1   |
| 20000    | 2   |
| 40000    | 1   |
| 80000    | 1   |
| 160000   | 0   |
| 320000   | 0   |
| 640000   | 2   |
| 1280000  | 5   |
| 2560000  | 8   |
| 5120000  | 16  |
| 10240000 | 33  |
| 20480000 | 62  |
| 40960000 | 126 |
| 81920000 | 250 |

java p11.Vector6 1

| N        | T     |
|----------|-------|
| 10000    | 42    |
| 20000    | 158   |
| 40000    | 623   |
| 80000    | 2508  |
| 160000   | 9955  |
| 320000   | 39820 |
| 640000   | Fdt   |
| 1280000  | Fdt   |
| 2560000  | Fdt   |
| 5120000  | Fdt   |
| 10240000 | Fdt   |
| 20480000 | Fdt   |
| 40960000 | Fdt   |
| 81920000 | Fdt   |

java p11.Vector7 1

| N        | T  |
|----------|----|
| 10000    | 0  |
| 20000    | 0  |
| 40000    | 0  |
| 80000    | 0  |
| 160000   | 0  |
| 320000   | 0  |
| 640000   | 1  |
| 1280000  | 0  |
| 2560000  | 1  |
| 5120000  | 3  |
| 10240000 | 5  |
| 20480000 | 11 |
| 40960000 | 24 |
| 81920000 | 47 |

¿Qué pasa con el tiempo si el tamaño del problema se multiplica por 2?

-Si la función es  $O(n)$  se multiplicaría por 2, si es  $O(n^2)$  se multiplicaría por 4

¿Qué pasa con el tiempo si el tamaño del problema se multiplica por otro k que no sea 2? (Pruebe, por ejemplo, para  $k=3$  y  $k=4$  y compruebe los tiempos obtenidos.)?

Pues en  $O(n)$  se multiplicaría por k y en  $O(n^2)$  se multiplicaría por  $k^2$

¿Razone si los tiempos obtenidos son los que se esperaban de la complejidad lineal  $O(n)$ ?

Si ya que va aproximadamente lineal y cada vez se multiplica por 2