

# Informática

## Búsqueda y Ordenamiento

Franco Di Pietro

Universidad Nacional de Rosario

Facultad de Ciencias Exactas, Ingeniería y Agrimensura

[dipietro@fceia.unr.edu.ar](mailto:dipietro@fceia.unr.edu.ar)

junio 2018

## Informática

Franco Di Pietro

Búsqueda

Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

Selección

Burbuja

## 1 Búsqueda

Búsqueda secuencial

Búsqueda dicotómica

## 2 Ordenamiento

Selección

Burbuja

## Informática

Franco Di Pietro

### Búsqueda

Búsqueda  
secuencial

Búsqueda  
dicotómica

### Ordenamiento

Selección

Burbuja

## 1 Búsqueda

Búsqueda secuencial

Búsqueda dicotómica

## 2 Ordenamiento

Selección

Burbuja

## Búsqueda secuencial

Es un tipo de búsqueda que sirve para buscar en conjuntos(arreglos) desordenados.

|     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
| 412 | 345 | 17  | 115 | 23  | 914 | 19  | 523 | 764 | 817 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 317 | 747 | 2   | 547 | 384 | 317 | 852 | 213 | 887 | 405 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 220 | 101 | 842 | 856 | 966 | 504 | 443 | 175 | 6   | 119 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 14  | 309 | 222 | 964 | 369 | 812 | 5   | 453 | 117 | 419 |

Busco = 19

| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 412 | 345 | 17  | 115 | 23  | 914 | 19  | 523 | 764 | 817 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 317 | 747 | 2   | 547 | 384 | 317 | 852 | 213 | 887 | 405 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 220 | 101 | 842 | 856 | 966 | 504 | 443 | 175 | 6   | 119 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 14  | 309 | 222 | 964 | 369 | 812 | 5   | 453 | 117 | 419 |

Busco = 19

| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 412 | 345 | 17  | 115 | 23  | 914 | 19  | 523 | 764 | 817 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 317 | 747 | 2   | 547 | 384 | 317 | 852 | 213 | 887 | 405 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 220 | 101 | 842 | 856 | 966 | 504 | 443 | 175 | 6   | 119 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 14  | 309 | 222 | 964 | 369 | 812 | 5   | 453 | 117 | 419 |

Busco = 19

| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 412 | 345 | 17  | 115 | 23  | 914 | 19  | 523 | 764 | 817 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 317 | 747 | 2   | 547 | 384 | 317 | 852 | 213 | 887 | 405 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 220 | 101 | 842 | 856 | 966 | 504 | 443 | 175 | 6   | 119 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 14  | 309 | 222 | 964 | 369 | 812 | 5   | 453 | 117 | 419 |

Busco = 19

| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 412 | 345 | 17  | 115 | 23  | 914 | 19  | 523 | 764 | 817 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 317 | 747 | 2   | 547 | 384 | 317 | 852 | 213 | 887 | 405 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 220 | 101 | 842 | 856 | 966 | 504 | 443 | 175 | 6   | 119 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 14  | 309 | 222 | 964 | 369 | 812 | 5   | 453 | 117 | 419 |

Busco = 19

| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 412 | 345 | 17  | 115 | 23  | 914 | 19  | 523 | 764 | 817 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 317 | 747 | 2   | 547 | 384 | 317 | 852 | 213 | 887 | 405 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 220 | 101 | 842 | 856 | 966 | 504 | 443 | 175 | 6   | 119 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 14  | 309 | 222 | 964 | 369 | 812 | 5   | 453 | 117 | 419 |

Busco = 19

| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 412 | 345 | 17  | 115 | 23  | 914 | 19  | 523 | 764 | 817 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 317 | 747 | 2   | 547 | 384 | 317 | 852 | 213 | 887 | 405 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 220 | 101 | 842 | 856 | 966 | 504 | 443 | 175 | 6   | 119 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 14  | 309 | 222 | 964 | 369 | 812 | 5   | 453 | 117 | 419 |

Busco = 19

| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 412 | 345 | 17  | 115 | 23  | 914 | 19  | 523 | 764 | 817 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 317 | 747 | 2   | 547 | 384 | 317 | 852 | 213 | 887 | 405 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 220 | 101 | 842 | 856 | 966 | 504 | 443 | 175 | 6   | 119 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 14  | 309 | 222 | 964 | 369 | 812 | 5   | 453 | 117 | 419 |

Busco = 19

| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 412 | 345 | 17  | 115 | 23  | 914 | 19  | 523 | 764 | 817 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 317 | 747 | 2   | 547 | 384 | 317 | 852 | 213 | 887 | 405 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 220 | 101 | 842 | 856 | 966 | 504 | 443 | 175 | 6   | 119 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 14  | 309 | 222 | 964 | 369 | 812 | 5   | 453 | 117 | 419 |

Busco = 19

| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 412 | 345 | 17  | 115 | 23  | 914 | 19  | 523 | 764 | 817 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 317 | 747 | 2   | 547 | 384 | 317 | 852 | 213 | 887 | 405 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 220 | 101 | 842 | 856 | 966 | 504 | 443 | 175 | 6   | 119 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 14  | 309 | 222 | 964 | 369 | 812 | 5   | 453 | 117 | 419 |

Busco = 19

| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 412 | 345 | 17  | 115 | 23  | 914 | 19  | 523 | 764 | 817 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 317 | 747 | 2   | 547 | 384 | 317 | 852 | 213 | 887 | 405 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 220 | 101 | 842 | 856 | 966 | 504 | 443 | 175 | 6   | 119 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 14  | 309 | 222 | 964 | 369 | 812 | 5   | 453 | 117 | 419 |

Elemento encontrado en posición: 7

Busco = 7

| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 412 | 345 | 17  | 115 | 23  | 914 | 19  | 523 | 764 | 817 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 317 | 747 | 2   | 547 | 384 | 317 | 852 | 213 | 887 | 405 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 220 | 101 | 842 | 856 | 966 | 504 | 443 | 175 | 6   | 119 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 14  | 309 | 222 | 964 | 369 | 812 | 5   | 453 | 117 | 419 |

Busco = 7

| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 412 | 345 | 17  | 115 | 23  | 914 | 19  | 523 | 764 | 817 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 317 | 747 | 2   | 547 | 384 | 317 | 852 | 213 | 887 | 405 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 220 | 101 | 842 | 856 | 966 | 504 | 443 | 175 | 6   | 119 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 14  | 309 | 222 | 964 | 369 | 812 | 5   | 453 | 117 | 419 |

Busco = 7

| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 412 | 345 | 17  | 115 | 23  | 914 | 19  | 523 | 764 | 817 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 317 | 747 | 2   | 547 | 384 | 317 | 852 | 213 | 887 | 405 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 220 | 101 | 842 | 856 | 966 | 504 | 443 | 175 | 6   | 119 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 14  | 309 | 222 | 964 | 369 | 812 | 5   | 453 | 117 | 419 |

Busco = 7

| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 412 | 345 | 17  | 115 | 23  | 914 | 19  | 523 | 764 | 817 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 317 | 747 | 2   | 547 | 384 | 317 | 852 | 213 | 887 | 405 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 220 | 101 | 842 | 856 | 966 | 504 | 443 | 175 | 6   | 119 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 14  | 309 | 222 | 964 | 369 | 812 | 5   | 453 | 117 | 419 |

Busco = 7

| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 412 | 345 | 17  | 115 | 23  | 914 | 19  | 523 | 764 | 817 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 317 | 747 | 2   | 547 | 384 | 317 | 852 | 213 | 887 | 405 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 220 | 101 | 842 | 856 | 966 | 504 | 443 | 175 | 6   | 119 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 14  | 309 | 222 | 964 | 369 | 812 | 5   | 453 | 117 | 419 |

Elemento no encontrado

## Algoritmo BúsquedaSecuencial

### Variables

entero:  $n$ ,  $i$ ,  $\text{valor}$ ,  $\text{cont}$ ,  $X[10000]$

### Inicio

**Leer**( $n$ ) // cantidad de elementos

**Repetir Para**  $i \leftarrow 1, n$

**Leer**( $X[i]$ ) // leer cada componente

**fin para**

// comienza la búsqueda

**Escribir**("Ingrese un valor a buscar")

**Leer**( $\text{valor}$ )

$\text{cont} \leftarrow 1$  // contador de pos

**Repetir mientras**( $\text{cont} < n \ \&\& \ X[\text{cont}] \neq \text{valor}$ )

$\text{cont} \leftarrow \text{cont} + 1$

**fin mientras**

**Si**( $X[\text{cont}] = \text{valor}$ ) **entonces**

**Escribir**("Primera coincidencia de",  $\text{valor}$ , " en  
        pos",  $\text{cont}$ )

**sino**

**Escribir**( $\text{valor}$ , "no presente en el conjunto")

**fin si**

**Fin**

## Búsqueda dicotómica

Es un tipo de búsqueda que sirve para buscar en conjuntos(arreglos) ordenados.

Busco = 19

| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2   | 5   | 6   | 14  | 17  | 19  | 23  | 101 | 115 | 117 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 119 | 175 | 213 | 220 | 222 | 309 | 317 | 327 | 345 | 369 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 384 | 405 | 412 | 419 | 445 | 453 | 504 | 523 | 547 | 747 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 764 | 812 | 817 | 842 | 852 | 856 | 887 | 914 | 964 | 966 |

Busco = 19

| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2   | 5   | 6   | 14  | 17  | 19  | 23  | 101 | 115 | 117 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 119 | 175 | 213 | 220 | 222 | 309 | 317 | 327 | 345 | 369 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 384 | 405 | 412 | 419 | 445 | 453 | 504 | 523 | 547 | 747 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 764 | 812 | 817 | 842 | 852 | 856 | 887 | 914 | 964 | 966 |

Inf=1

Sup=40

Med=(40+1)/2=20

Busco = 19

| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2   | 5   | 6   | 14  | 17  | 19  | 23  | 101 | 115 | 117 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 119 | 175 | 213 | 220 | 222 | 309 | 317 | 327 | 345 | 369 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 384 | 405 | 412 | 419 | 445 | 453 | 504 | 523 | 547 | 747 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 764 | 812 | 817 | 842 | 852 | 856 | 887 | 914 | 964 | 966 |

Inf=1

Sup=40

Med=(40+1)/2=20

19<369

Busco = 19

| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2   | 5   | 6   | 14  | 17  | 19  | 23  | 101 | 115 | 117 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 119 | 175 | 213 | 220 | 222 | 309 | 317 | 327 | 345 | 369 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 384 | 405 | 412 | 419 | 445 | 453 | 504 | 523 | 547 | 747 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 764 | 812 | 817 | 842 | 852 | 856 | 887 | 914 | 964 | 966 |

Inf=1

Sup=19

Med=(19+1)/2=10

Busco = 19

| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2   | 5   | 6   | 14  | 17  | 19  | 23  | 101 | 115 | 117 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 119 | 175 | 213 | 220 | 222 | 309 | 317 | 327 | 345 | 369 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 384 | 405 | 412 | 419 | 445 | 453 | 504 | 523 | 547 | 747 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 764 | 812 | 817 | 842 | 852 | 856 | 887 | 914 | 964 | 966 |

Inf=1

Sup=19

Med=(19+1)/2=10

19<117

Busco = 19

| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2   | 5   | 6   | 14  | 17  | 19  | 23  | 101 | 115 | 117 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 119 | 175 | 213 | 220 | 222 | 309 | 317 | 327 | 345 | 369 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 384 | 405 | 412 | 419 | 445 | 453 | 504 | 523 | 547 | 747 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 764 | 812 | 817 | 842 | 852 | 856 | 887 | 914 | 964 | 966 |

Inf=1

Sup=9

Med=(9+1)/2=5

Busco = 19

| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2   | 5   | 6   | 14  | 17  | 19  | 23  | 101 | 115 | 117 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 119 | 175 | 213 | 220 | 222 | 309 | 317 | 327 | 345 | 369 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 384 | 405 | 412 | 419 | 445 | 453 | 504 | 523 | 547 | 747 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 764 | 812 | 817 | 842 | 852 | 856 | 887 | 914 | 964 | 966 |

Inf=1

Sup=9

Med=(9+1)/2=5

19>17

Busco = 19

| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2   | 5   | 6   | 14  | 17  | 19  | 23  | 101 | 115 | 117 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 119 | 175 | 213 | 220 | 222 | 309 | 317 | 327 | 345 | 369 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 384 | 405 | 412 | 419 | 445 | 453 | 504 | 523 | 547 | 747 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 764 | 812 | 817 | 842 | 852 | 856 | 887 | 914 | 964 | 966 |

Inf=6

Sup=9

Med=(9+6)/2=7

Busco = 19

| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2   | 5   | 6   | 14  | 17  | 19  | 23  | 101 | 115 | 117 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 119 | 175 | 213 | 220 | 222 | 309 | 317 | 327 | 345 | 369 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 384 | 405 | 412 | 419 | 445 | 453 | 504 | 523 | 547 | 747 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 764 | 812 | 817 | 842 | 852 | 856 | 887 | 914 | 964 | 966 |

Inf=6

Sup=9

Med=(9+6)/2=7

19<23

Busco = 19

| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2   | 5   | 6   | 14  | 17  | 19  | 23  | 101 | 115 | 117 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 119 | 175 | 213 | 220 | 222 | 309 | 317 | 327 | 345 | 369 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 384 | 405 | 412 | 419 | 445 | 453 | 504 | 523 | 547 | 747 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 764 | 812 | 817 | 842 | 852 | 856 | 887 | 914 | 964 | 966 |

Inf=6

Sup=6

Med=(6+6)/2=6

Busco = 19

| 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2   | 5   | 6   | 14  | 17  | 19  | 23  | 101 | 115 | 117 |
| 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
| 119 | 175 | 213 | 220 | 222 | 309 | 317 | 327 | 345 | 369 |
| 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
| 384 | 405 | 412 | 419 | 445 | 453 | 504 | 523 | 547 | 747 |
| 31  | 32  | 33  | 34  | 35  | 36  | 37  | 38  | 39  | 40  |
| 764 | 812 | 817 | 842 | 852 | 856 | 887 | 914 | 964 | 966 |

Encontrado en posición: 6

**Algoritmo** BusquedaDicotomica

**Variables**

entero:  $X[1000]$ ,  $n$ ,  $i$ , **min**, **max**, medio, valor

**Inicio**

**Leer**( $n$ )

**Repetir para**  $i \leftarrow 1, n$

**Leer**( $x[i]$ )

**fin para**

**Leer**(valor) // valor a buscar

**min**  $\leftarrow 1$

**max**  $\leftarrow n$

medio  $\leftarrow (\text{min} + \text{max})/2$

**Repetir mientras** ( $X[\text{medio}] \neq \text{valor} \ \&\& \ \text{min} \leq \text{max}$ )

**Si** ( $\text{valor} < X[\text{medio}]$ ) **entonces** **max**  $\leftarrow \text{medio} - 1$

**sino** **min**  $\leftarrow \text{medio} + 1$

**fin si**

medio  $\leftarrow (\text{min} + \text{max})/2$

**fin mientras**

**Si** ( $X[\text{medio}] = \text{valor}$ ) **entonces** **Escribir** (valor, "en pos"  
, medio)

**sino** **Escribir** (valor, "no presente")

**fin si**

**Fin**

## Informática

Franco Di Pietro

Búsqueda

Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

Selección

Burbuja

## 1 Búsqueda

Búsqueda secuencial

Búsqueda dicotómica

## 2 Ordenamiento

Selección

Burbuja

## Informática

Franco Di Pietro

Búsqueda

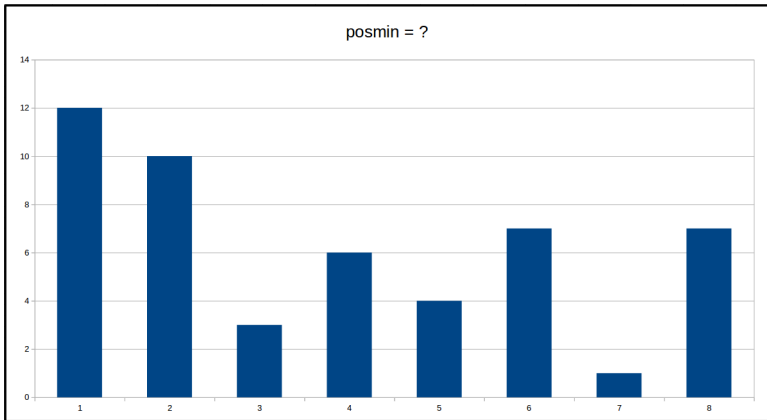
Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja



Informática

Franco Di Pietro

Búsqueda

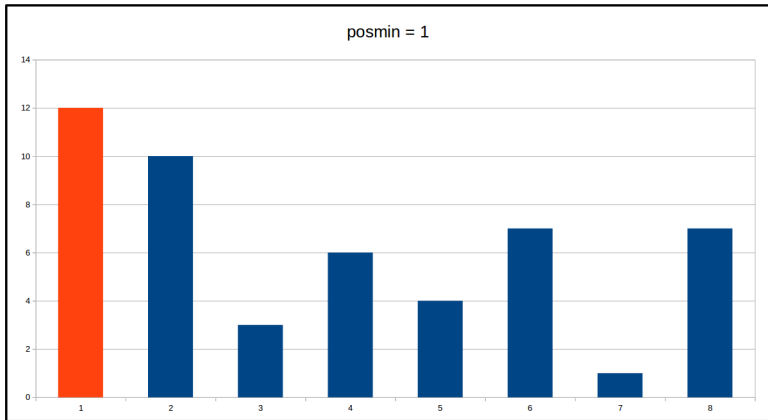
Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja



Informática

Franco Di Pietro

Búsqueda

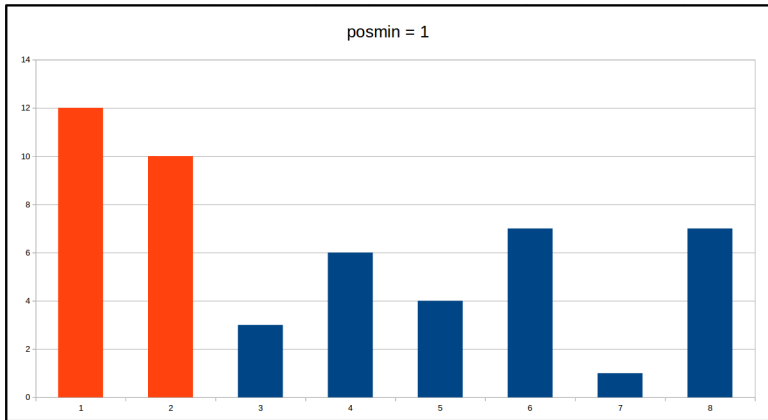
Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja



Informática

Franco Di Pietro

Búsqueda

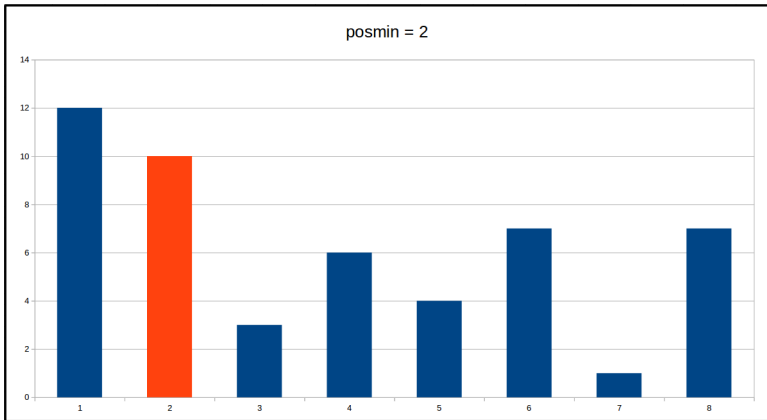
Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja



Informática

Franco Di Pietro

Búsqueda

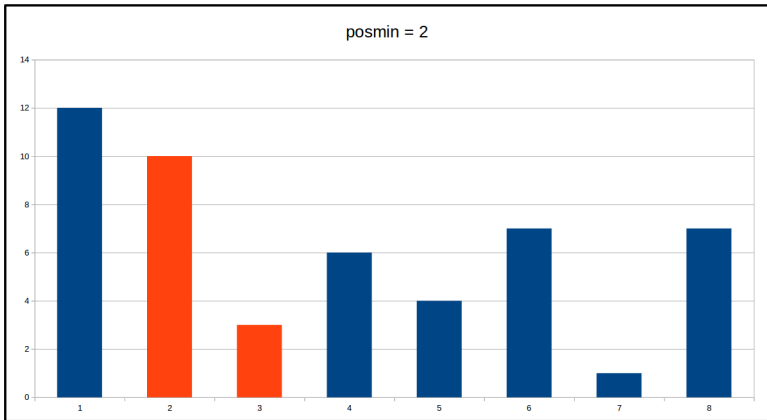
Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja



Informática

Franco Di Pietro

Búsqueda

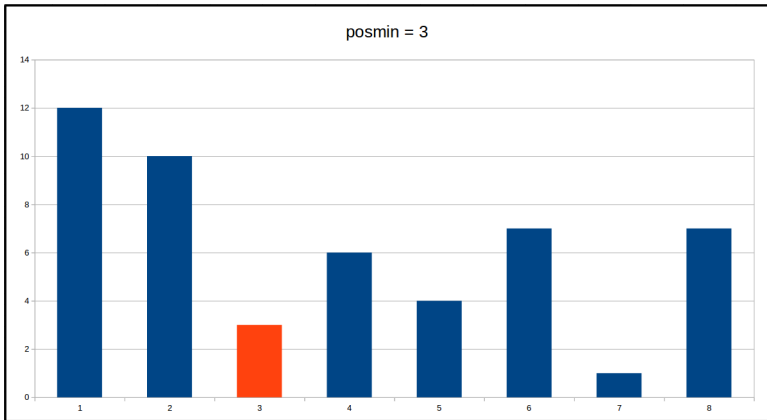
Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja



Informática

Franco Di Pietro

Búsqueda

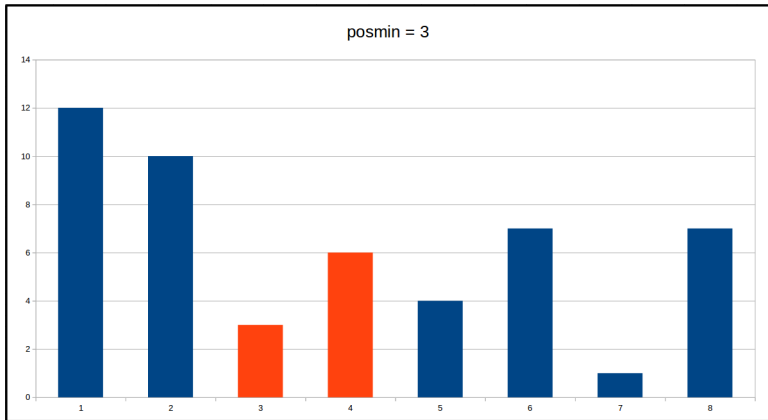
Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja



Informática

Franco Di Pietro

Búsqueda

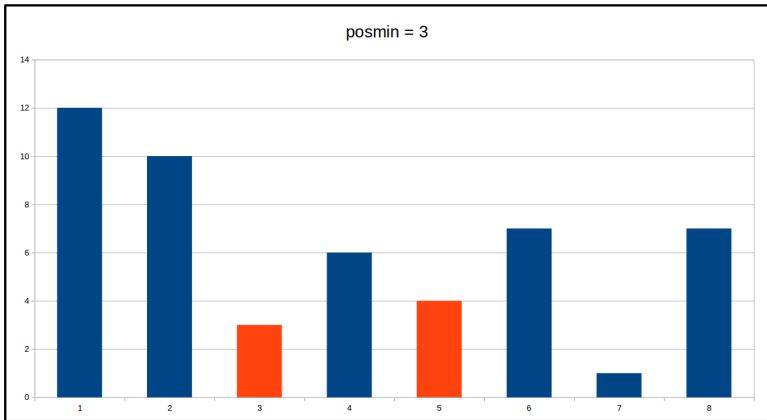
Búsqueda  
secuencial

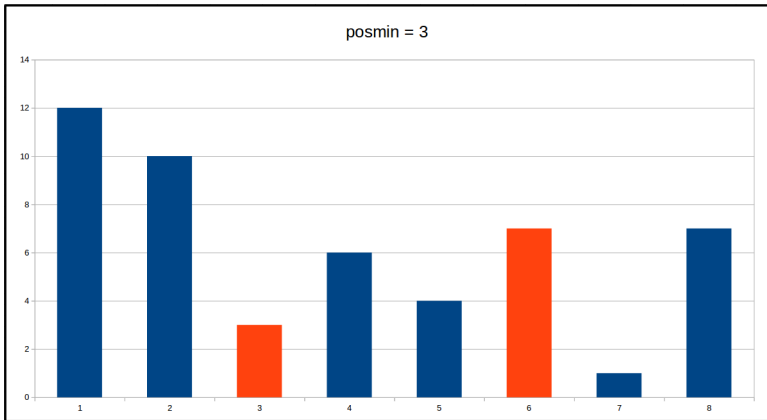
Búsqueda  
dicotómica

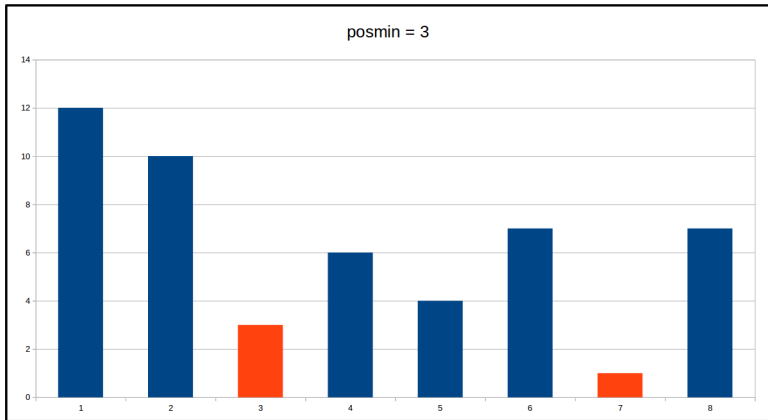
Ordenamiento

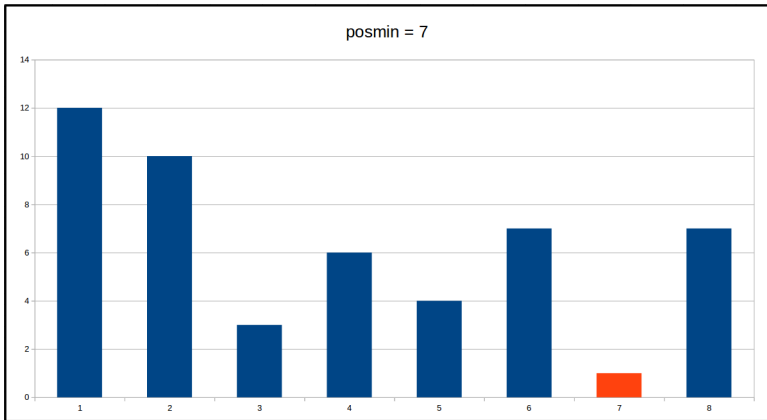
**Selección**

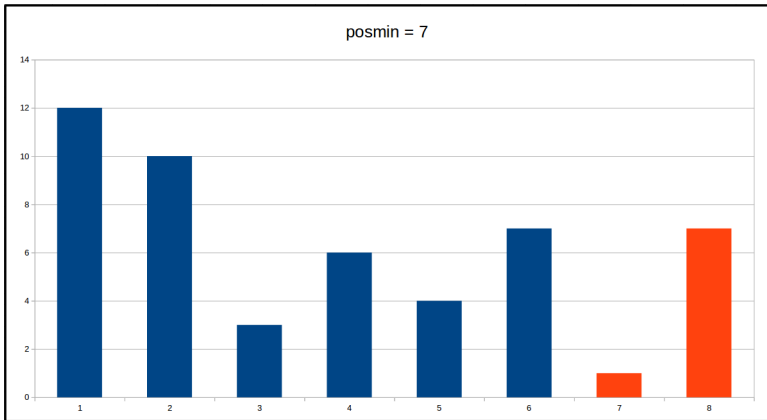
Burbuja











Informática

Franco Di Pietro

Búsqueda

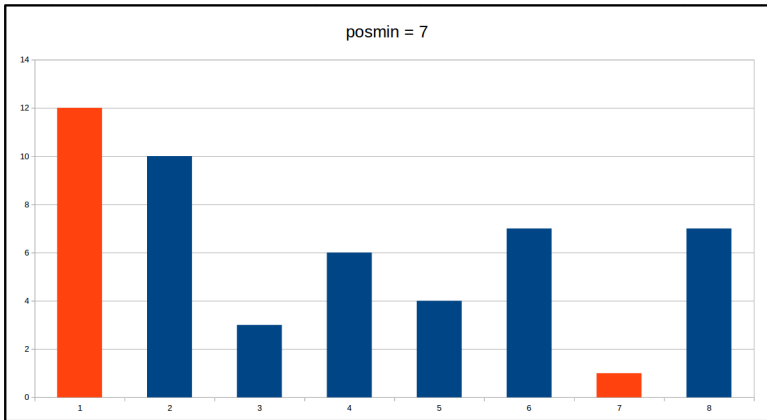
Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja



Informática

Franco Di Pietro

Búsqueda

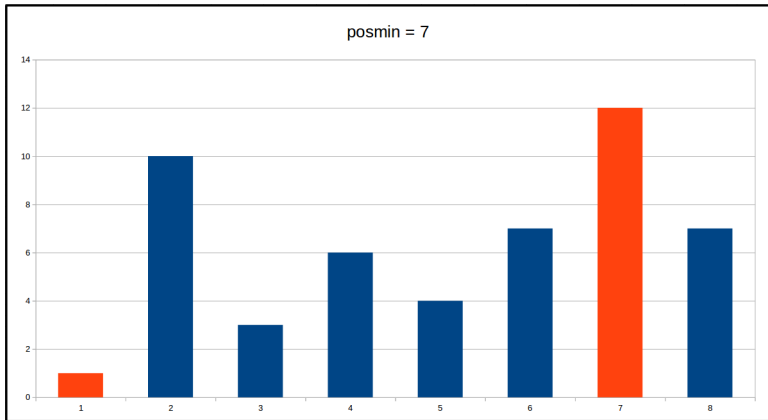
Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja



## Informática

Franco Di Pietro

Búsqueda

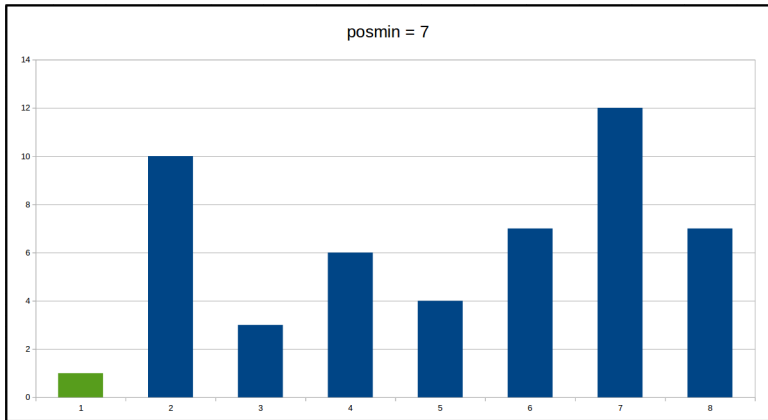
Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja



Informática

Franco Di Pietro

Búsqueda

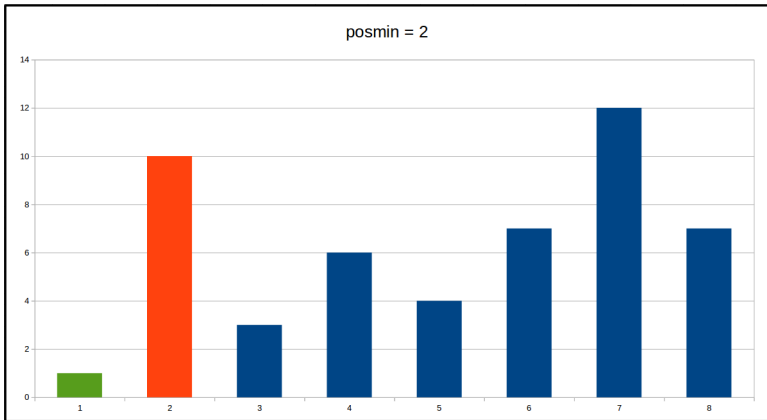
Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja



Informática

Franco Di Pietro

Búsqueda

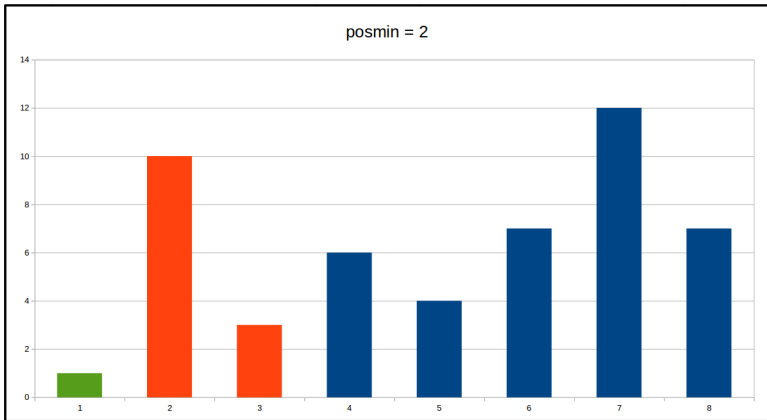
Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja



Informática

Franco Di Pietro

Búsqueda

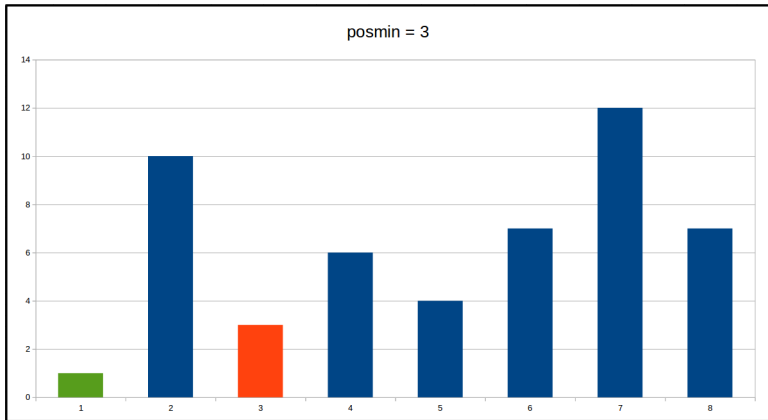
Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja



Informática

Franco Di Pietro

Búsqueda

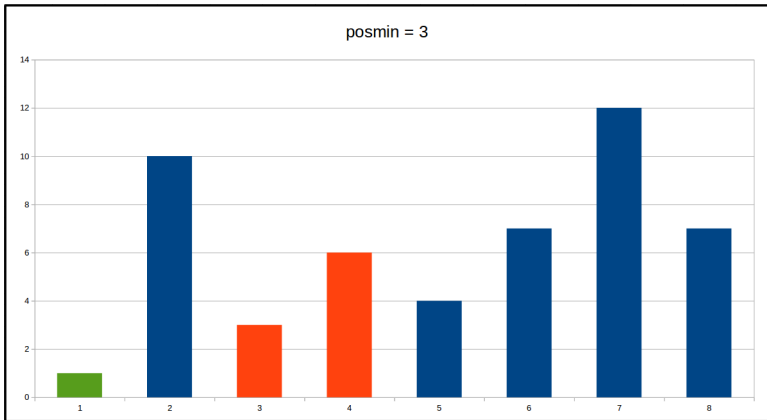
Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja



Informática

Franco Di Pietro

Búsqueda

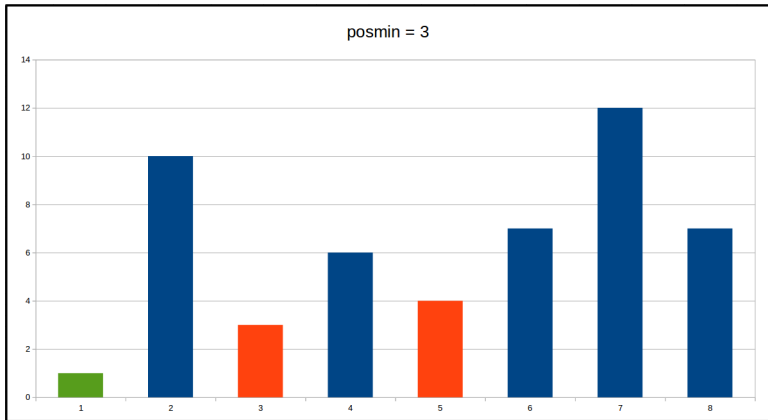
Búsqueda  
secuencial

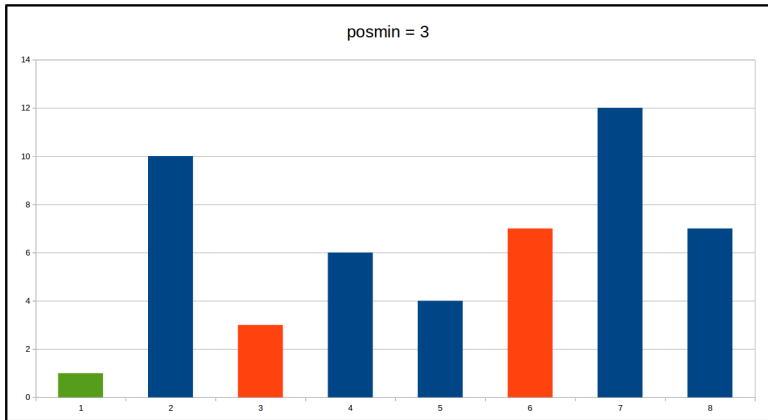
Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja





Informática

Franco Di Pietro

Búsqueda

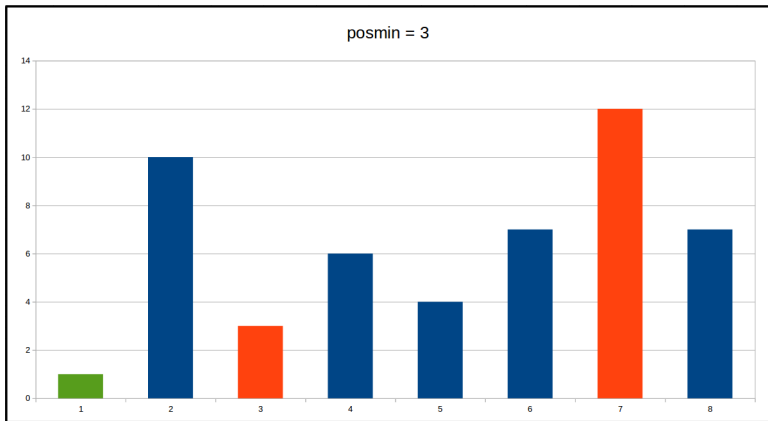
Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja



Informática

Franco Di Pietro

Búsqueda

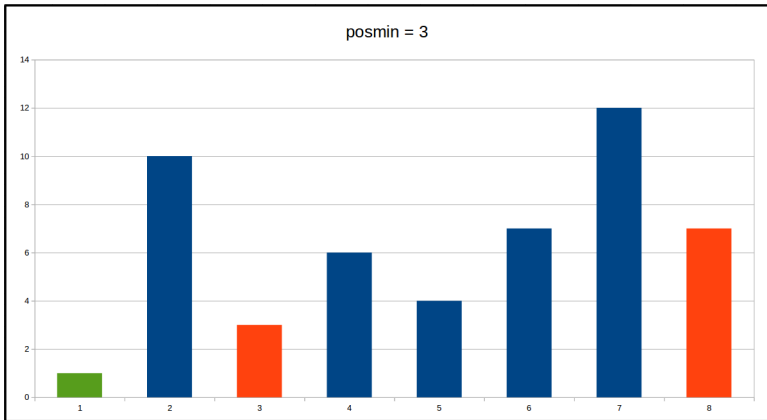
Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja



## Informática

Franco Di Pietro

Búsqueda

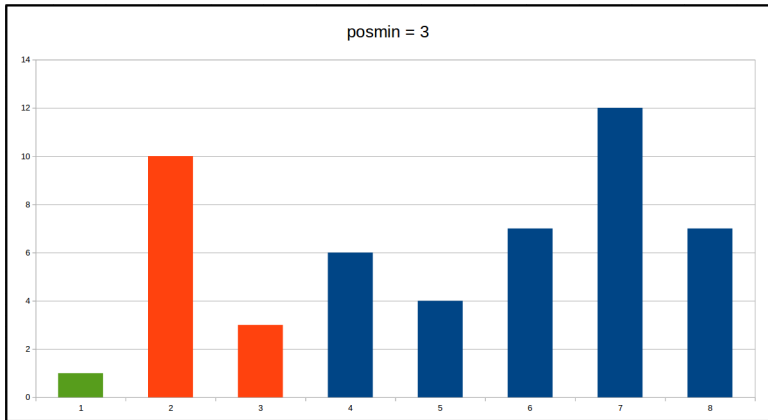
Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja



Informática

Franco Di Pietro

Búsqueda

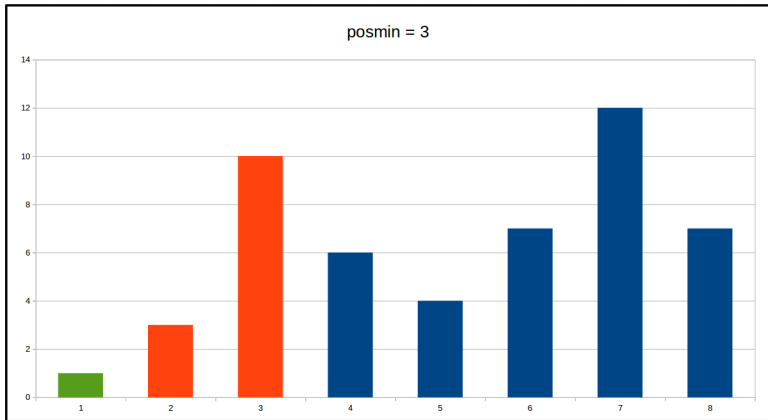
Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja



Informática

Franco Di Pietro

Búsqueda

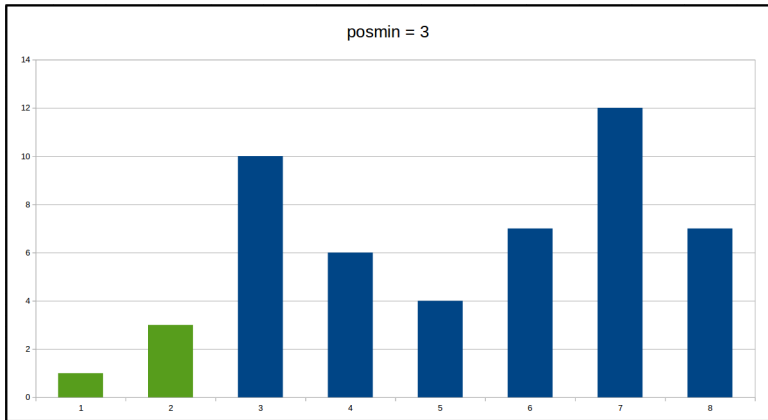
Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja



Informática

Franco Di Pietro

Búsqueda

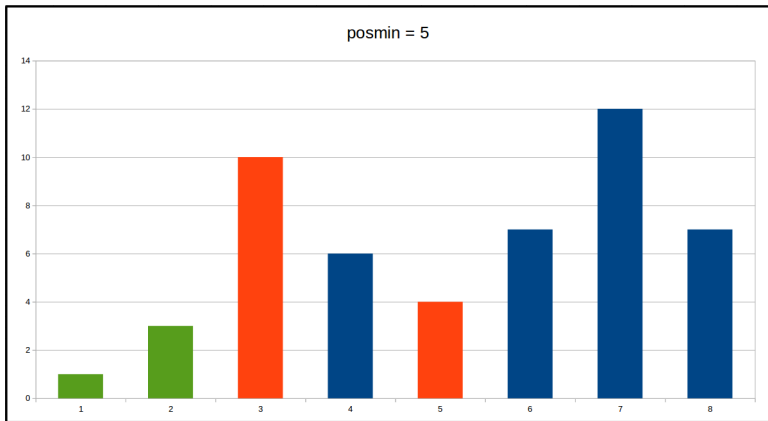
Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja



Informática

Franco Di Pietro

Búsqueda

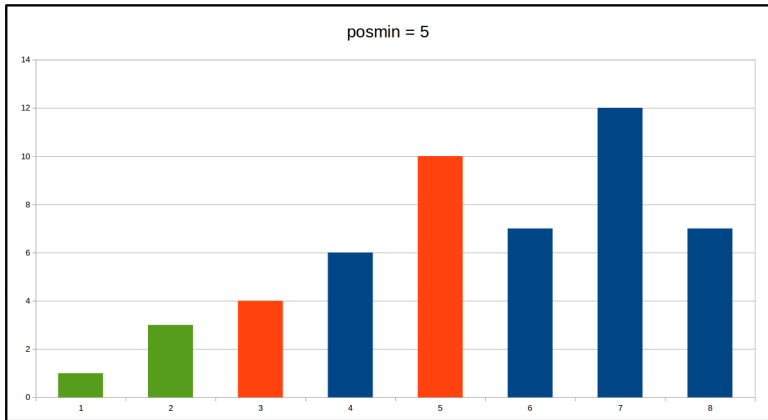
Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja



## Informática

Franco Di Pietro

Búsqueda

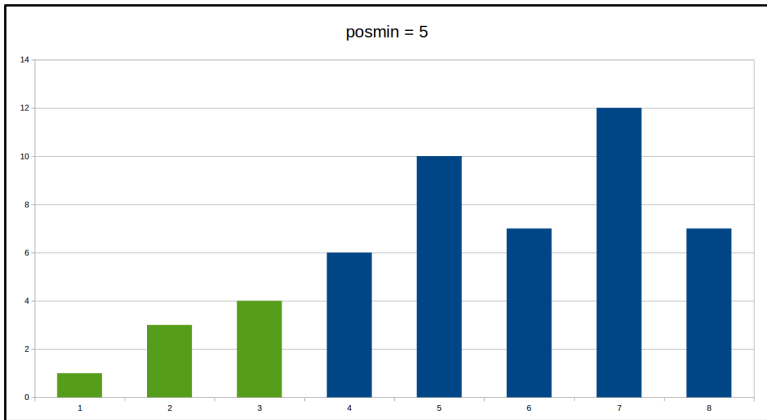
Búsqueda  
secuencial

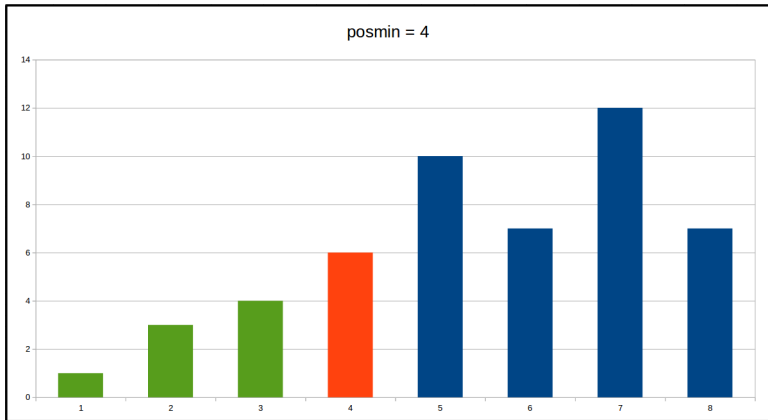
Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja





## Informática

Franco Di Pietro

Búsqueda

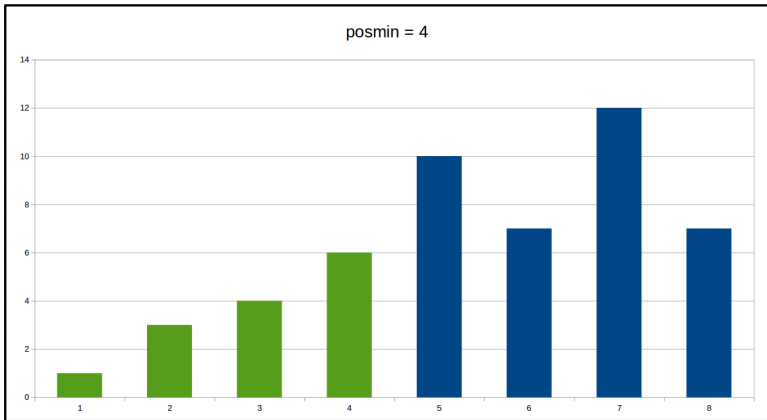
Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja



Informática

Franco Di Pietro

Búsqueda

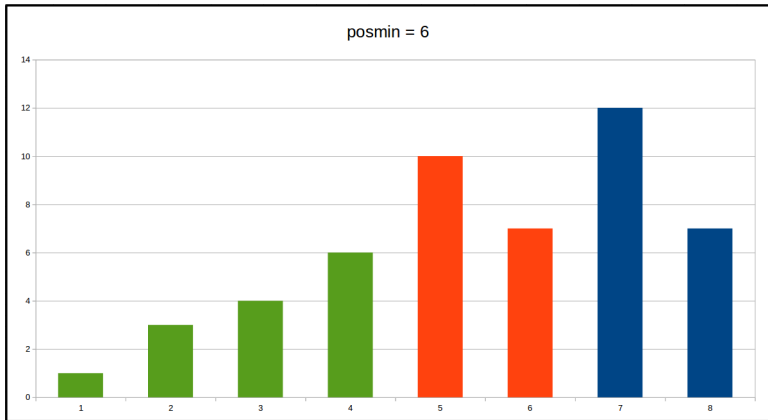
Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja



Informática

Franco Di Pietro

Búsqueda

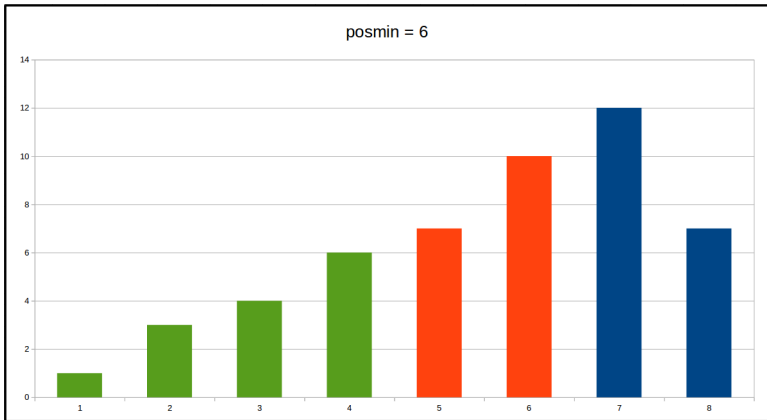
Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja



## Informática

Franco Di Pietro

Búsqueda

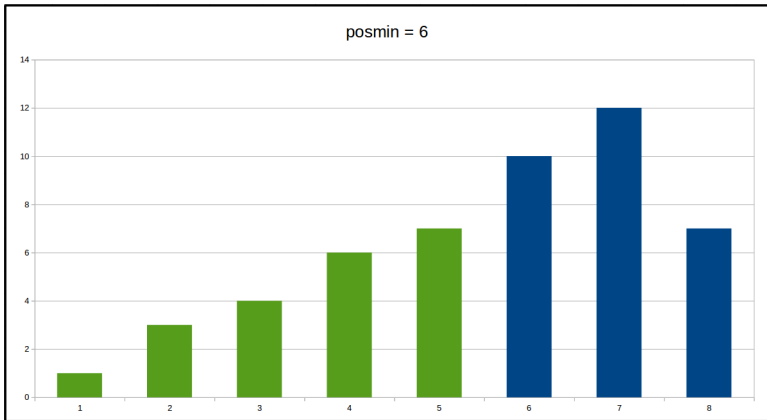
Búsqueda  
secuencial

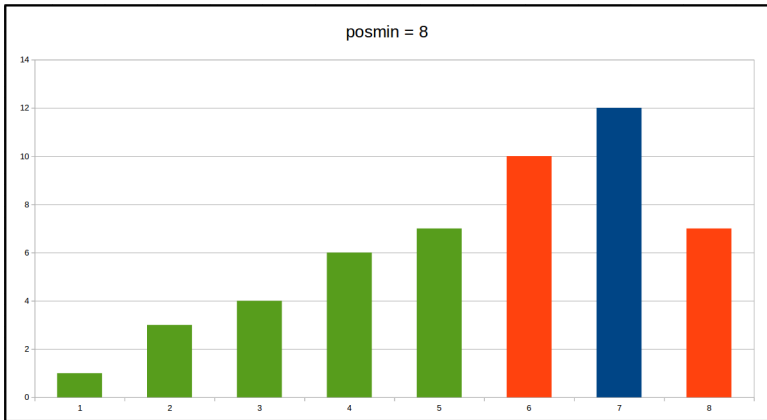
Búsqueda  
dicotómica

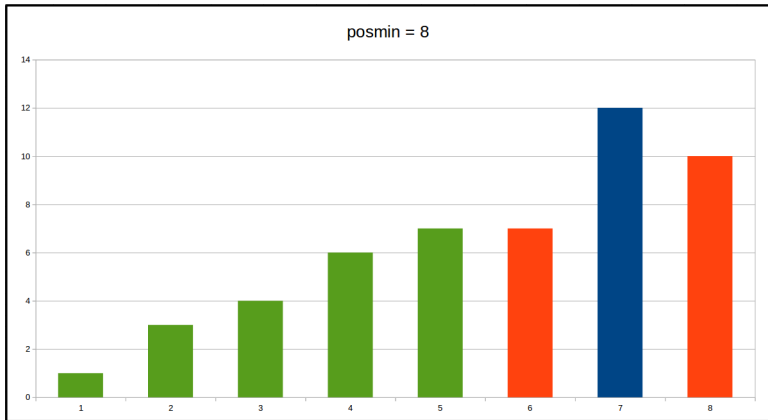
Ordenamiento

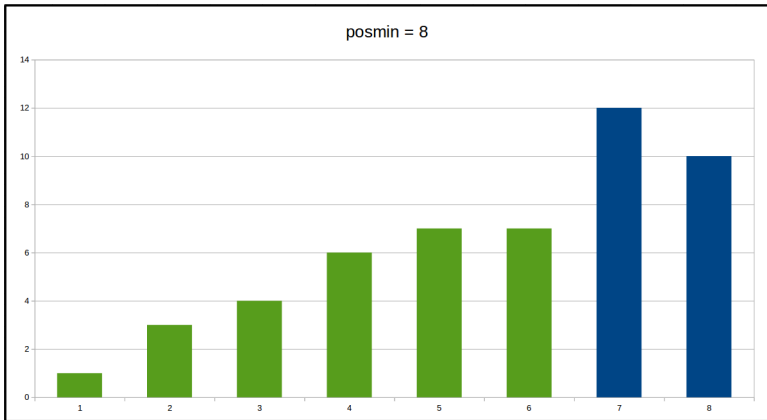
**Selección**

Burbuja









## Informática

Franco Di Pietro

Búsqueda

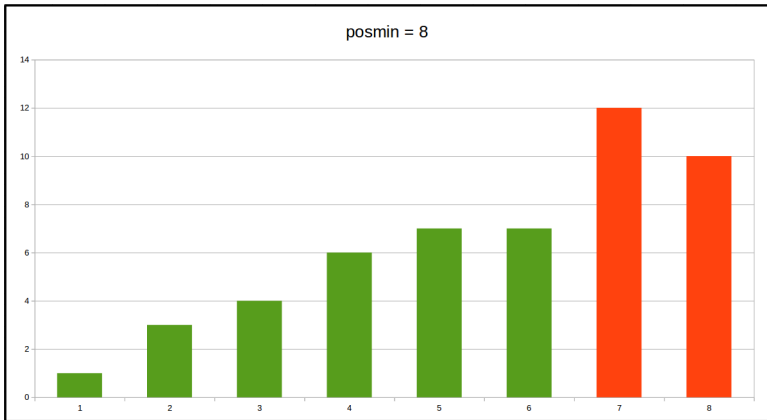
Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja



## Informática

Franco Di Pietro

Búsqueda

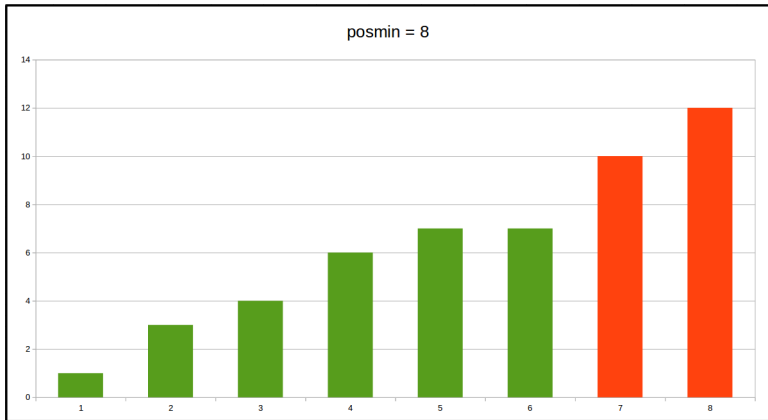
Búsqueda  
secuencial

Búsqueda  
dicotómica

Ordenamiento

**Selección**

Burbuja



## Informática

Franco Di Pietro

Búsqueda

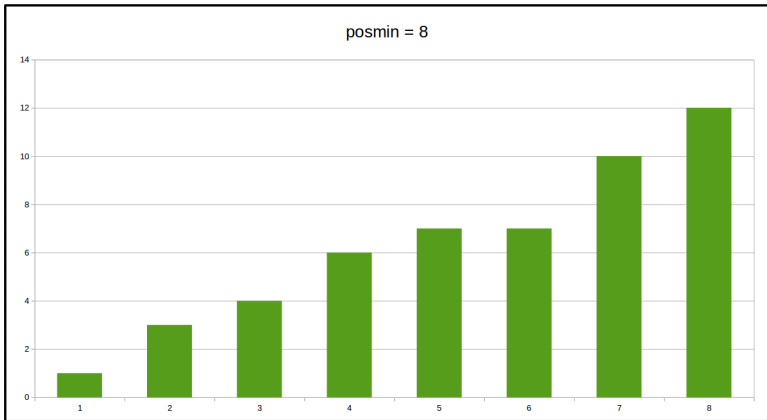
Búsqueda  
secuencial

Búsqueda  
dicotómica

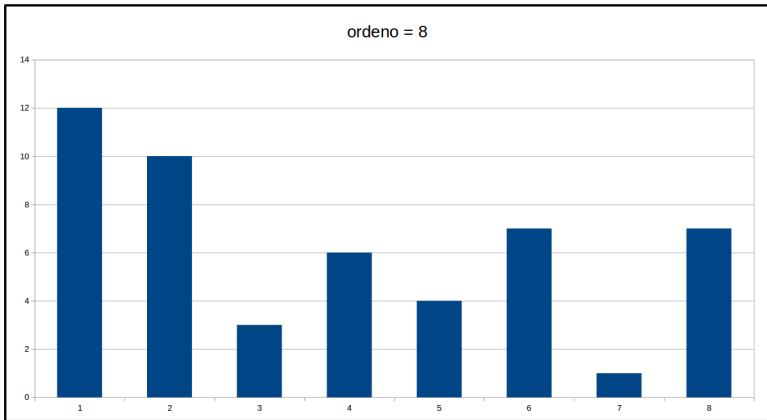
Ordenamiento

**Selección**

Burbuja



**Algoritmo** Selección**Variables**entero:  $n, i, j, \text{posmin}$ real:  $V[10000], \text{aux}$ **Inicio****Leer** ( $n$ ) // cantidad de elementos**Repetir para**  $i \leftarrow 1, n$     **Leer** ( $V[i]$ )    **fin para****Repetir para**  $i \leftarrow 1, n-1$  // ordenamiento     $\text{posmin} \leftarrow i$     **Repetir Para**  $j \leftarrow i+1, n$         **Si** ( $V[j] < V[\text{posmin}]$ ) **entonces**             $\text{posmin} \leftarrow j$         **fin si**    **fin para**     $\text{aux} \leftarrow V[\text{posmin}]$  // intercambiar     $V[\text{posmin}] \leftarrow V[i]$      $V[i] \leftarrow \text{aux}$     **fin para****Repetir Para**  $i \leftarrow 1, n$  // Mostrar vector ordenado    **Escribir** ( $V[i]$ )    **fin para****Fin**



Informática

Franco Di Pietro

Búsqueda

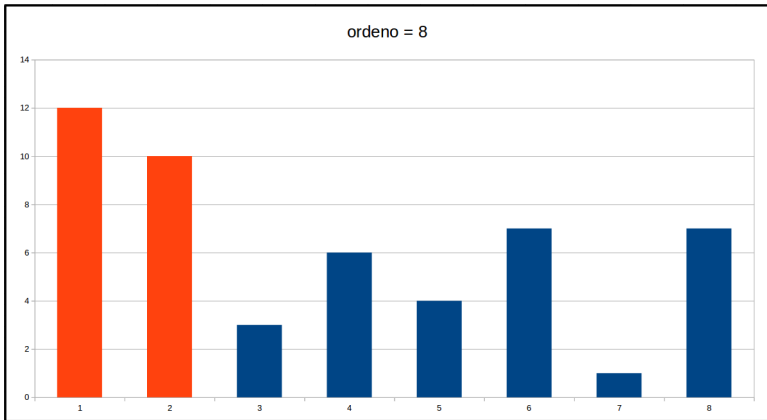
Búsqueda  
secuencial

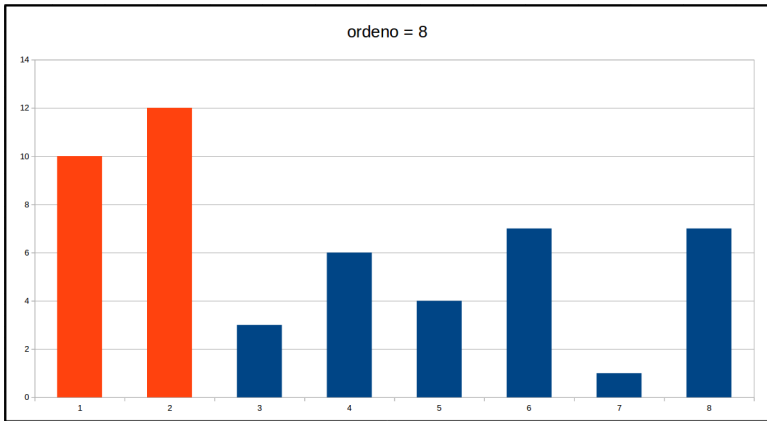
Búsqueda  
dicotómica

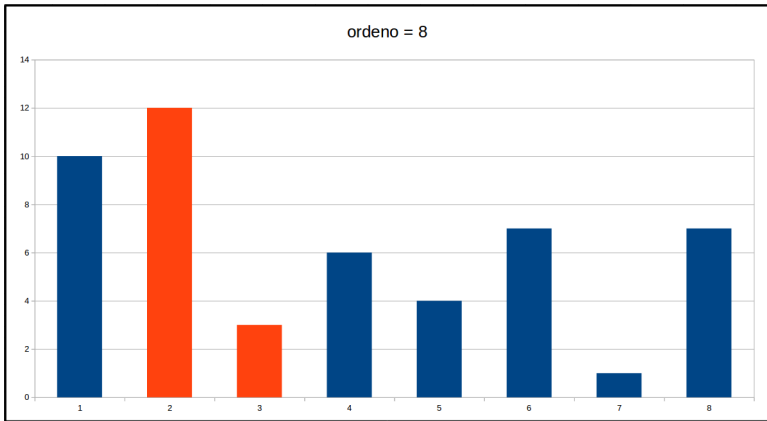
Ordenamiento

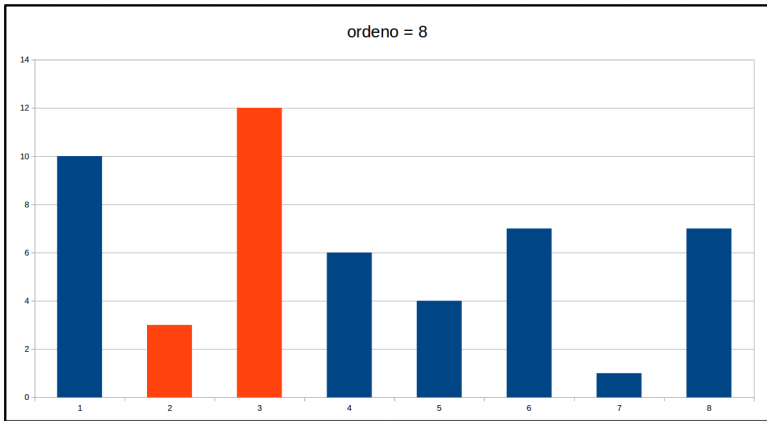
Selección

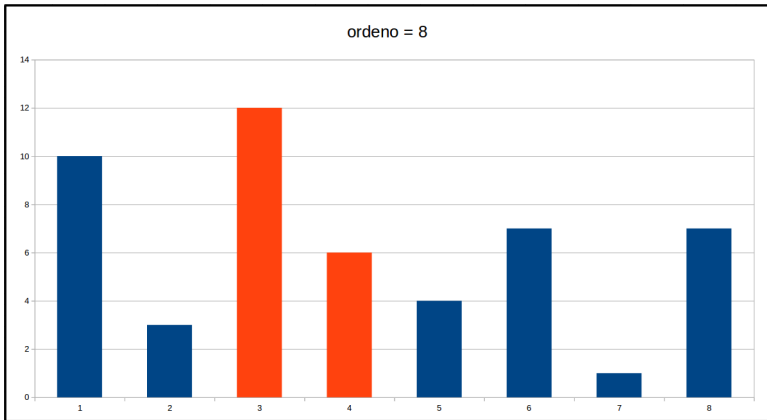
Burbuja

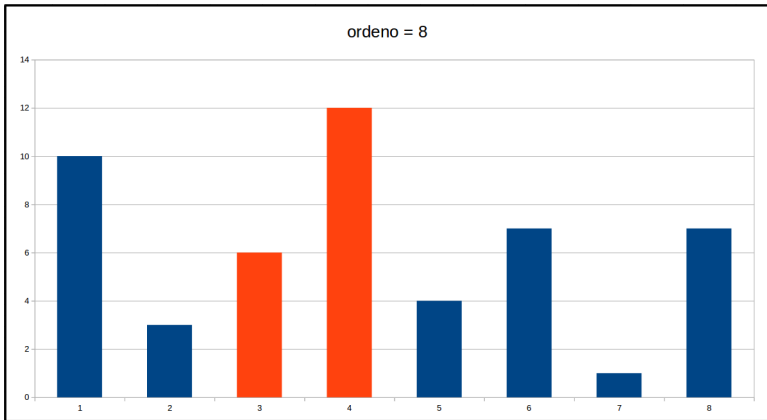


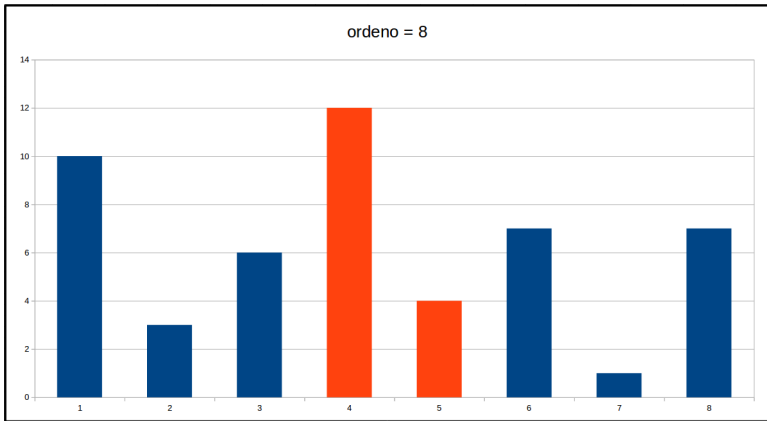












Informática

Franco Di Pietro

Búsqueda

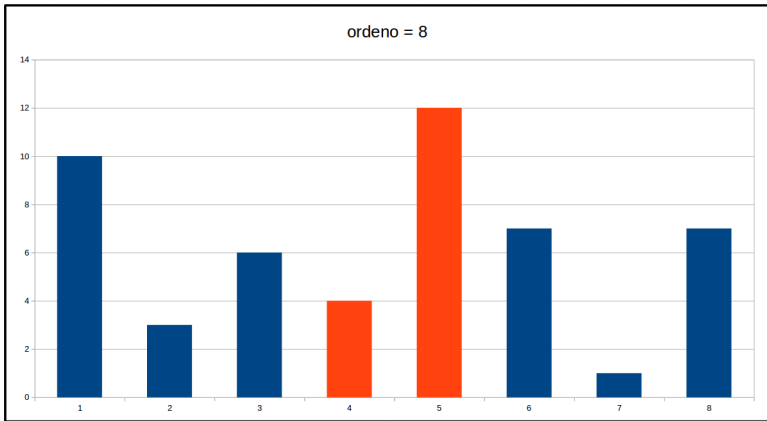
Búsqueda  
secuencial

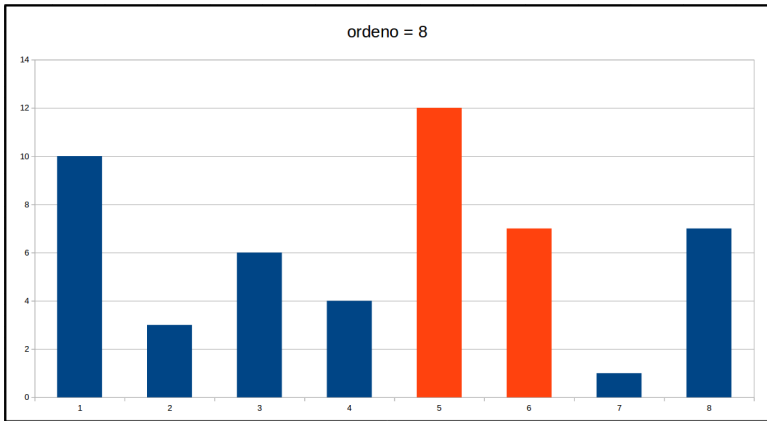
Búsqueda  
dicotómica

Ordenamiento

Selección

Burbuja





Informática

Franco Di Pietro

Búsqueda

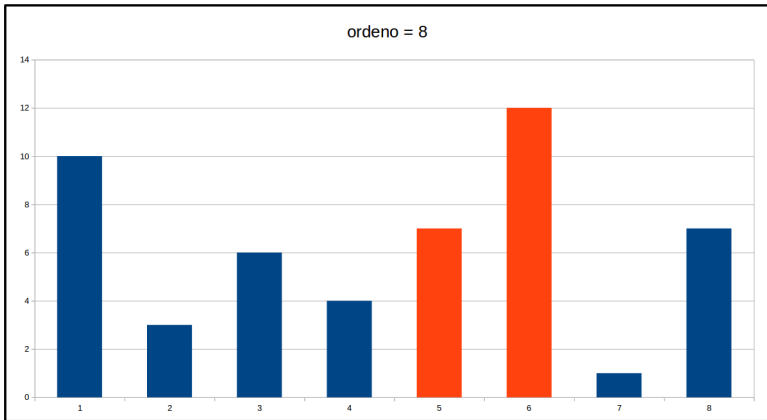
Búsqueda  
secuencial

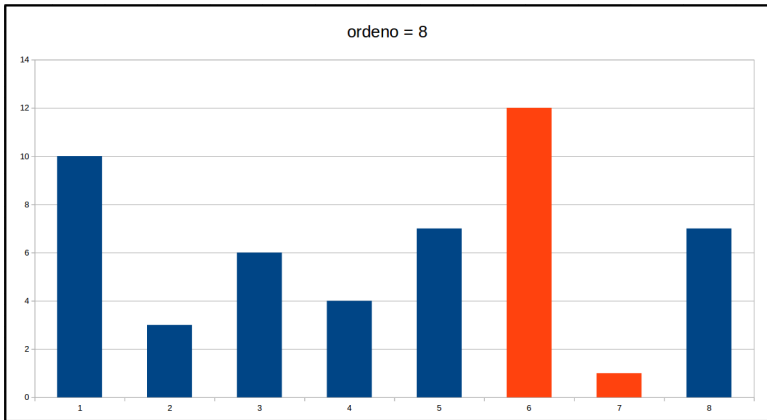
Búsqueda  
dicotómica

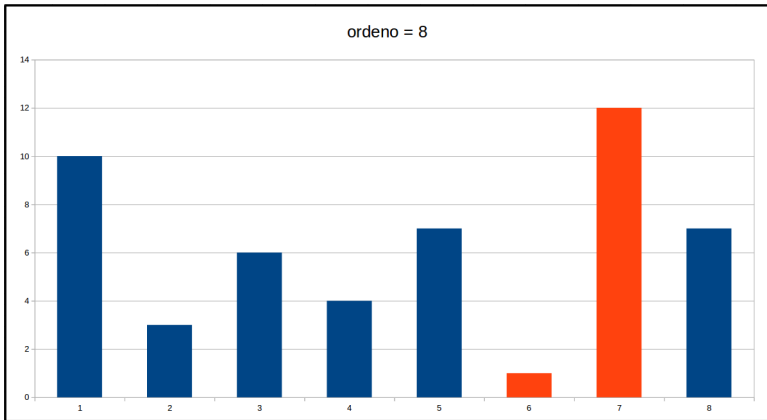
Ordenamiento

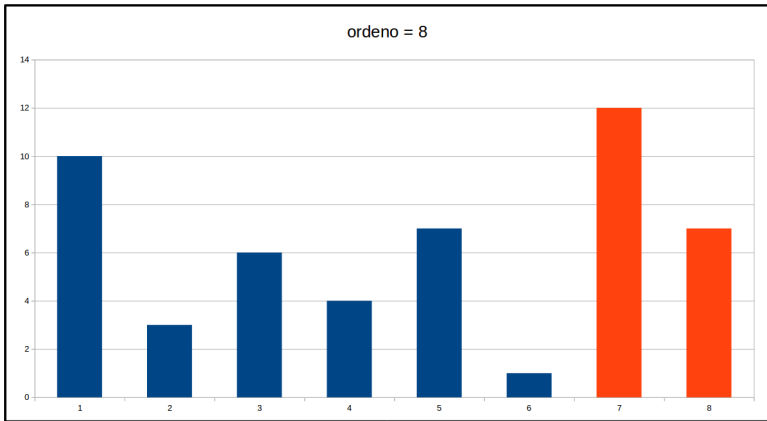
Selección

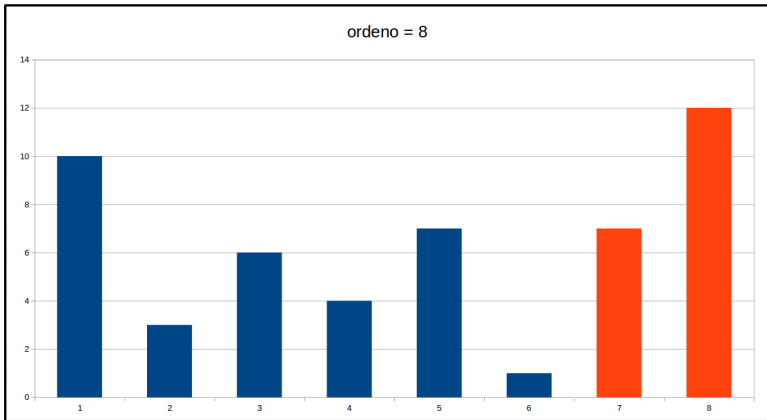
Burbuja

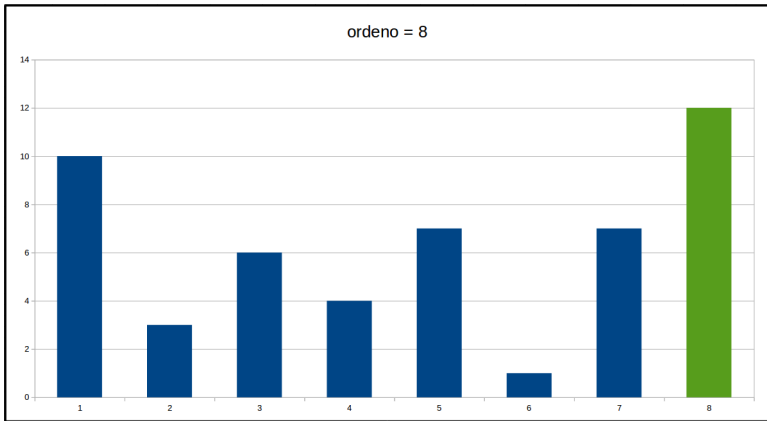


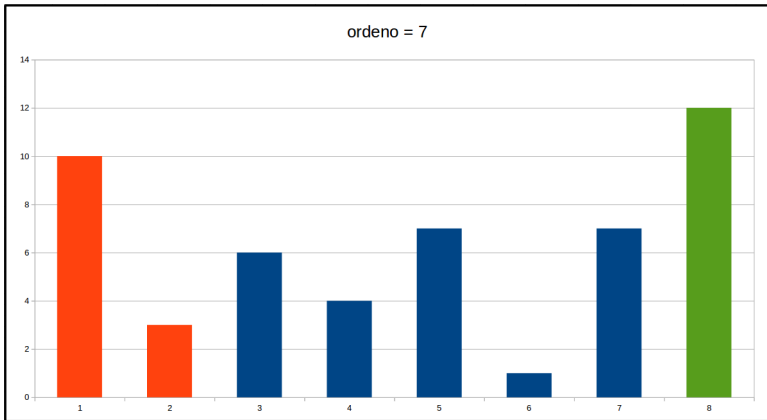


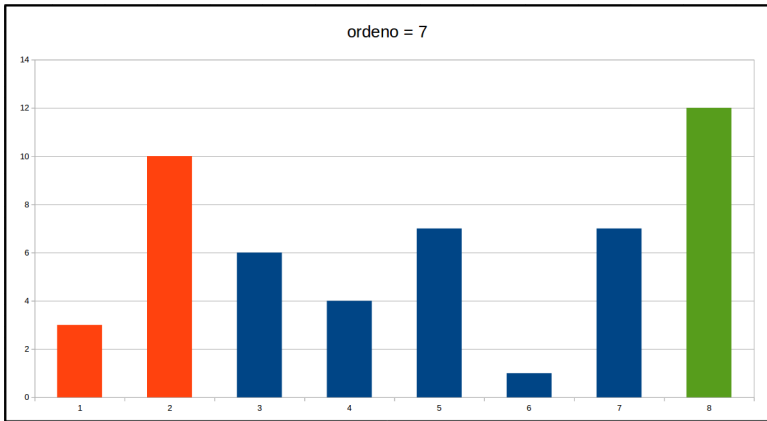


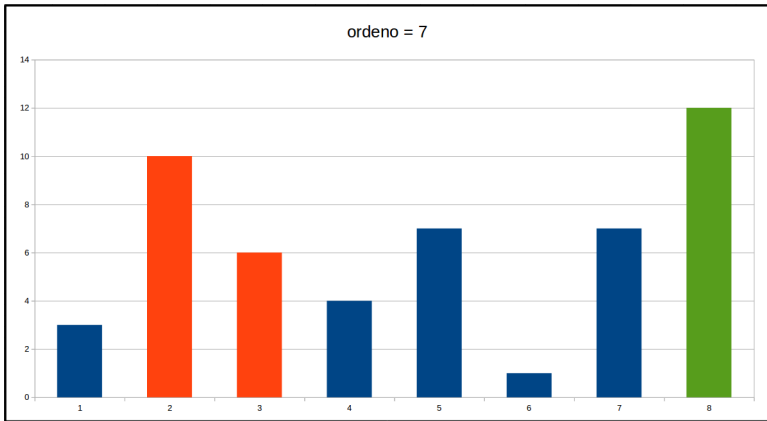


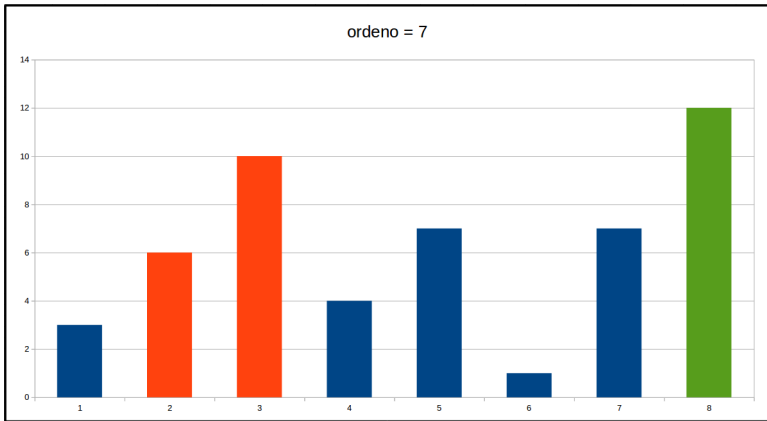


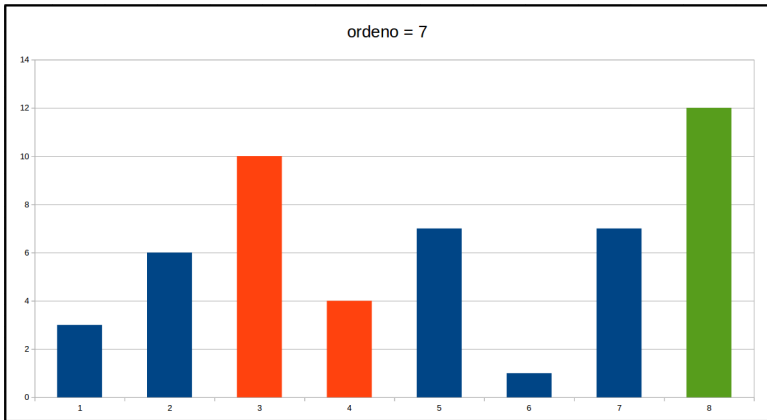


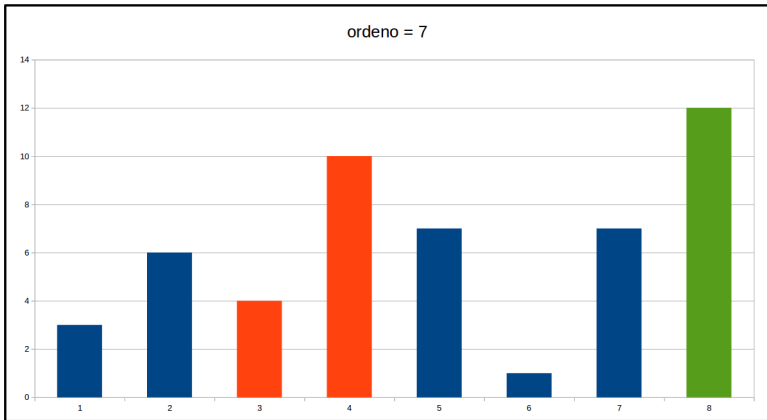












Informática

Franco Di Pietro

Búsqueda

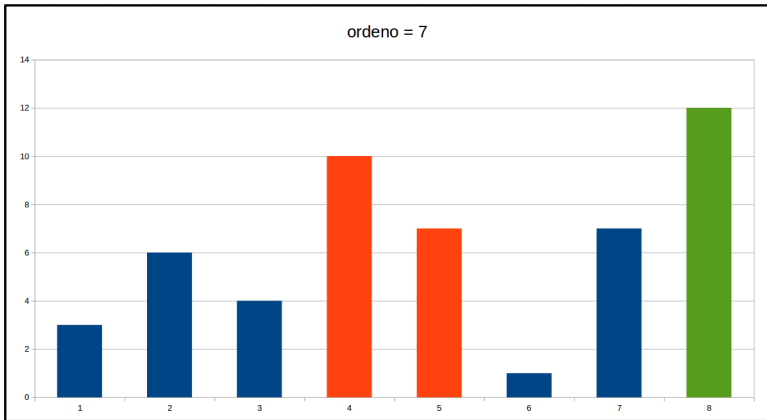
Búsqueda  
secuencial

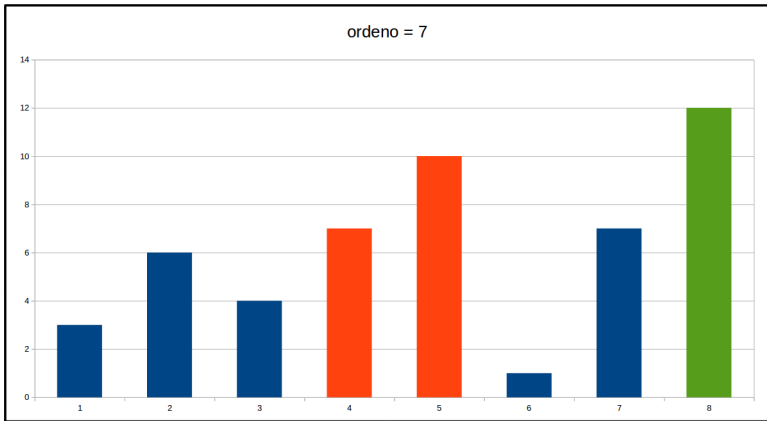
Búsqueda  
dicotómica

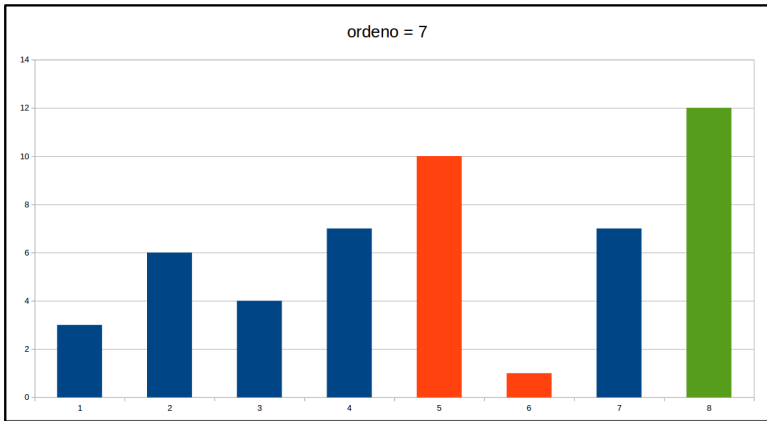
Ordenamiento

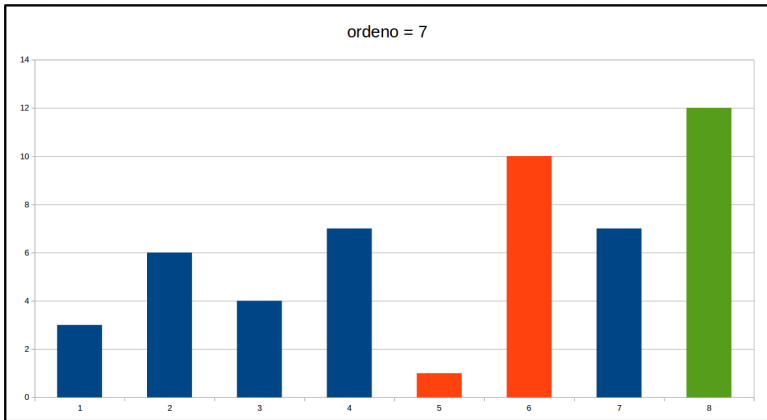
Selección

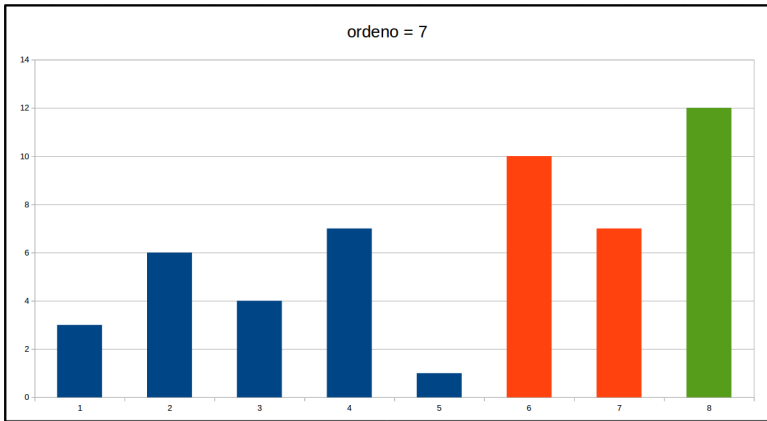
Burbuja

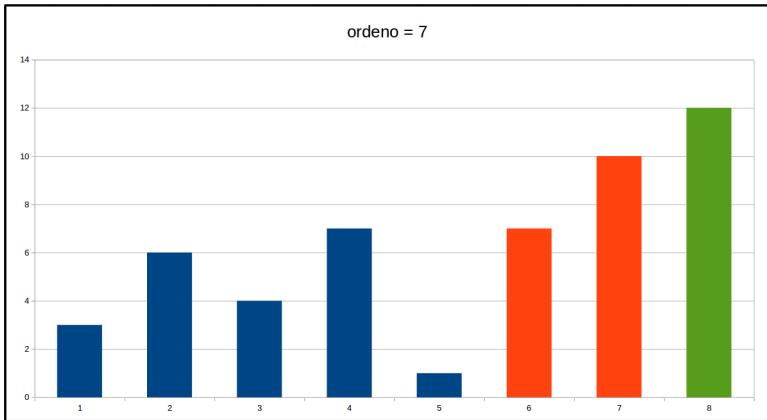












## Informática

Franco Di Pietro

Búsqueda

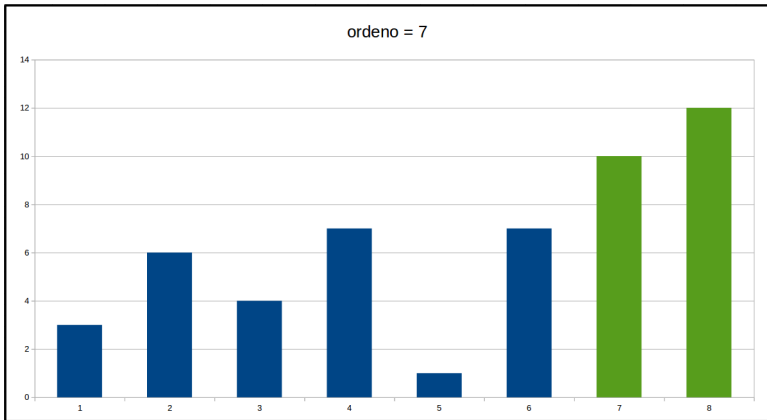
Búsqueda  
secuencial

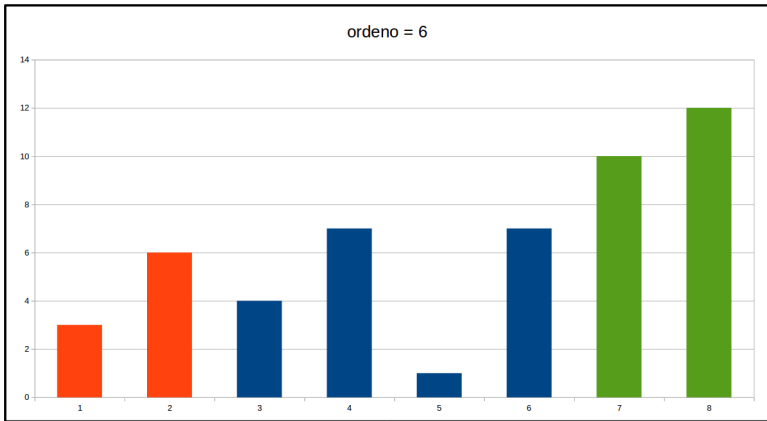
Búsqueda  
dicotómica

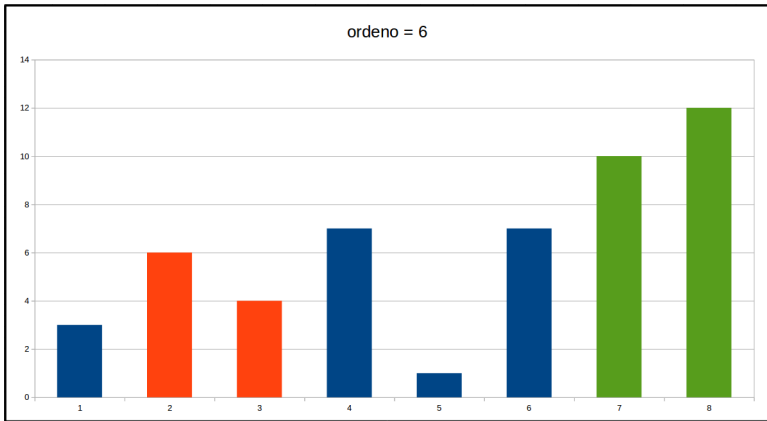
Ordenamiento

Selección

**Burbuja**







## Informática

Franco Di Pietro

Búsqueda

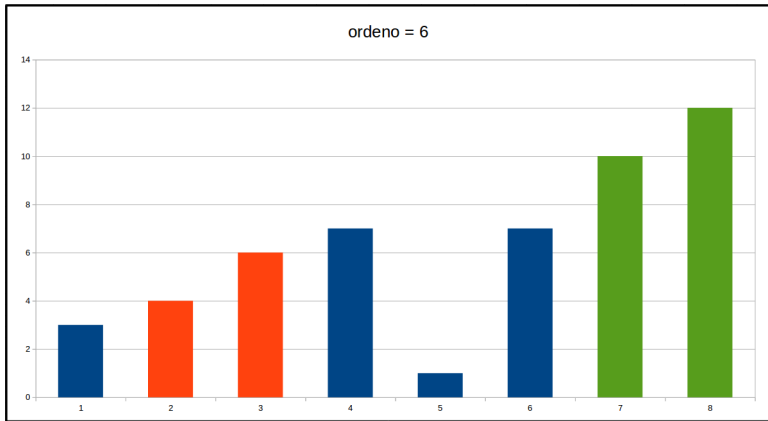
Búsqueda  
secuencial

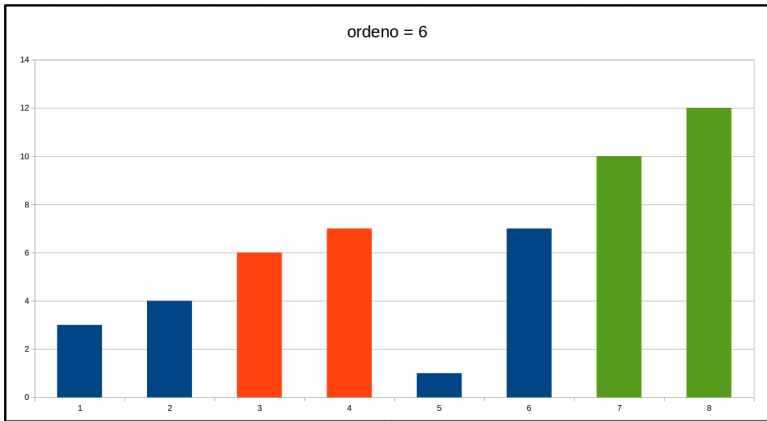
Búsqueda  
dicotómica

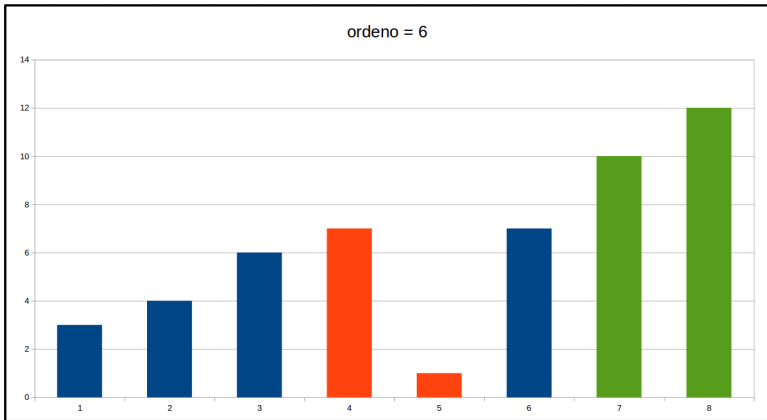
Ordenamiento

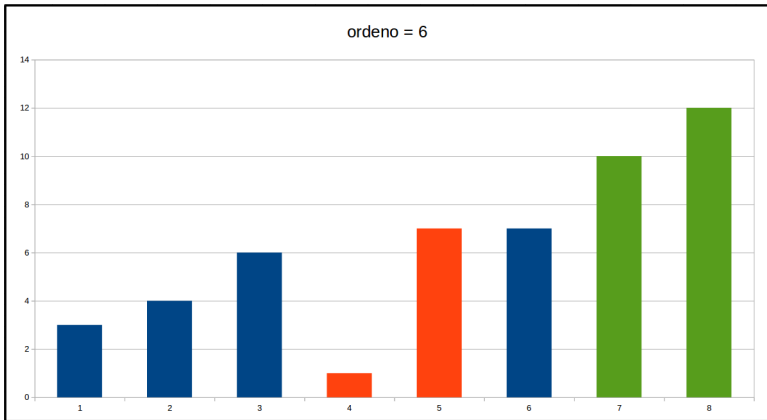
Selección

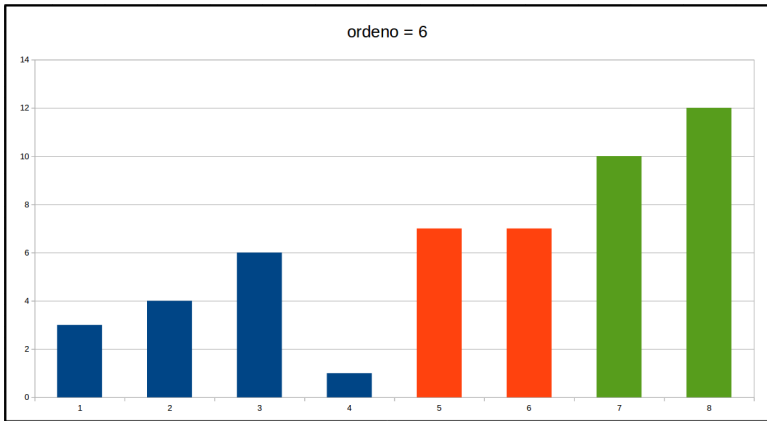
**Burbuja**

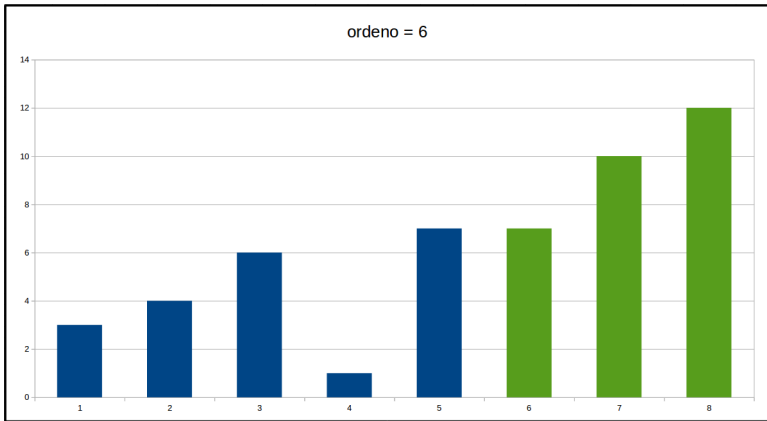


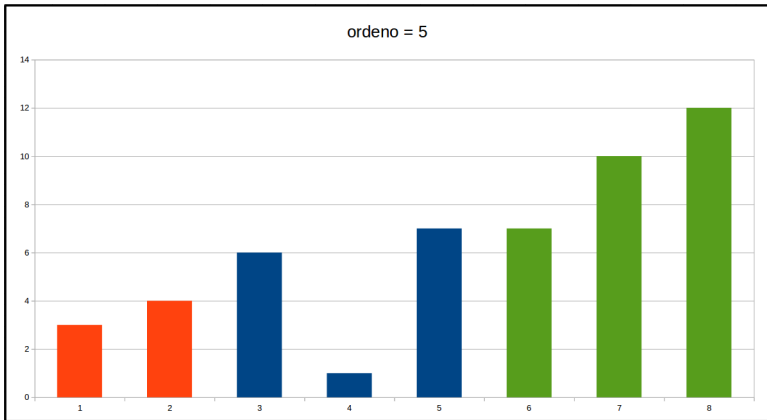


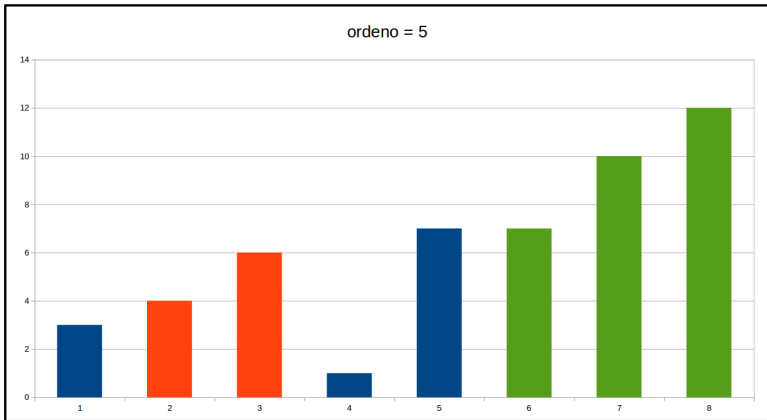


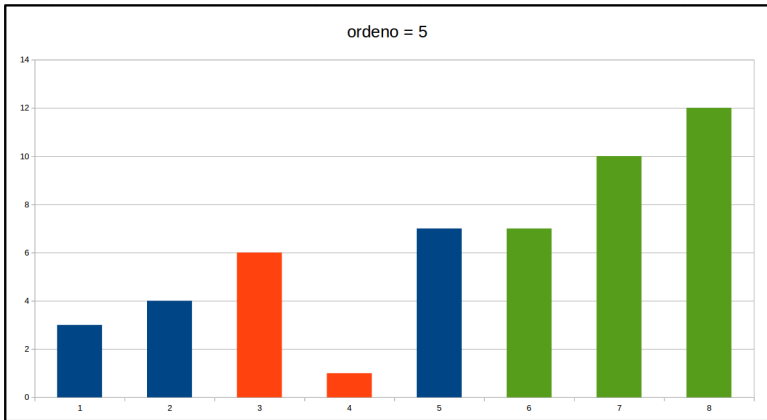


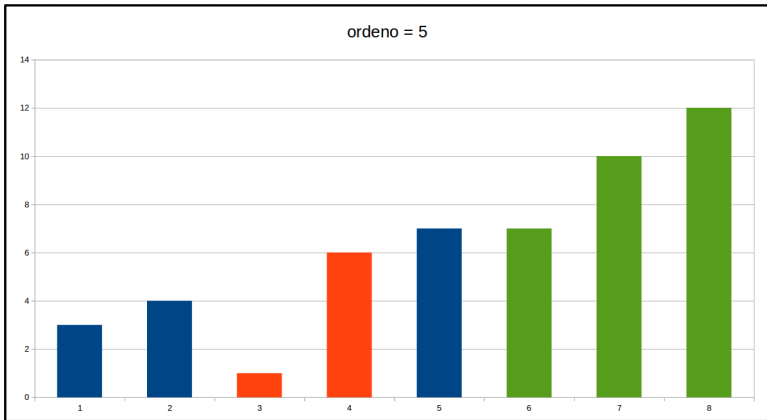


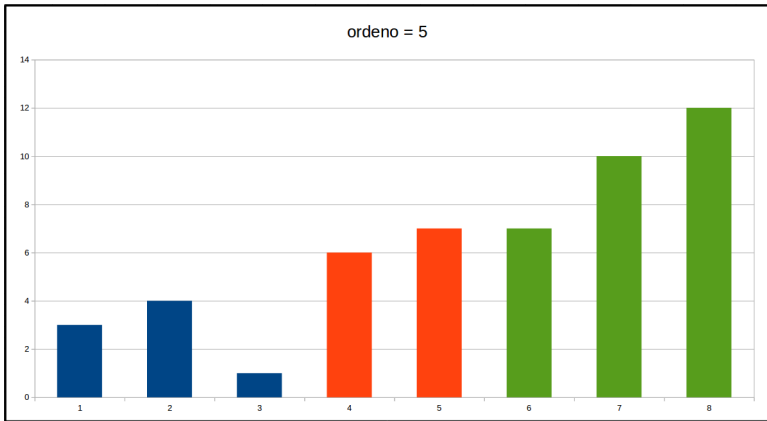


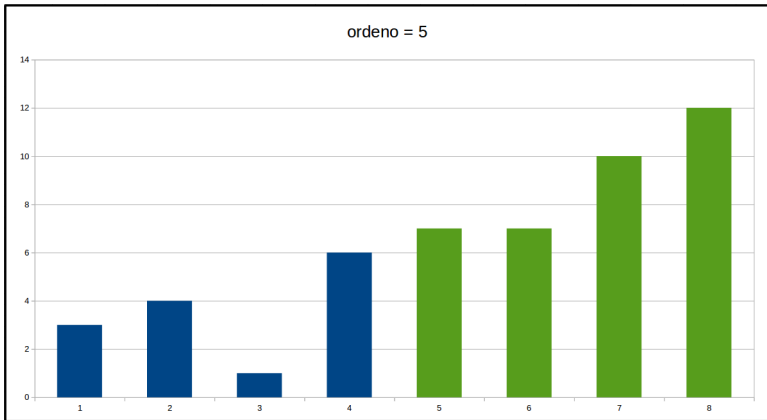


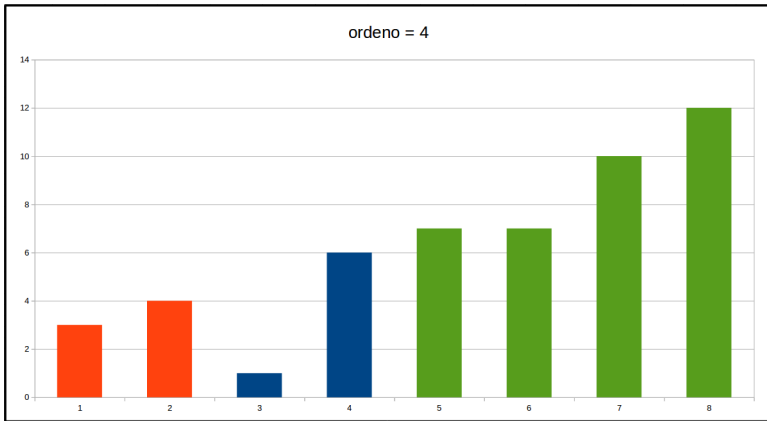


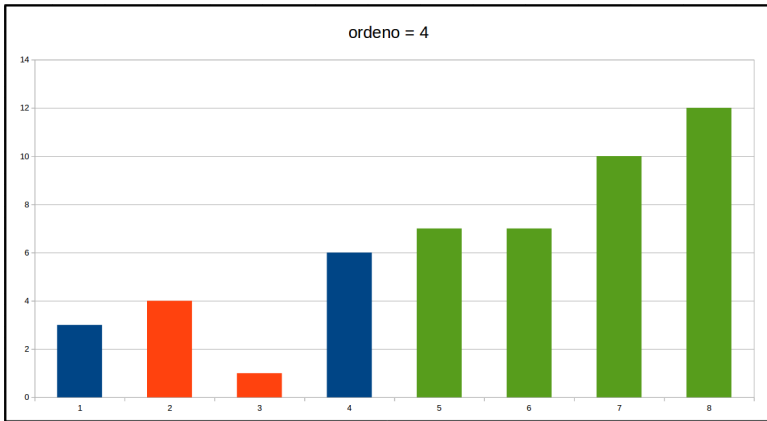


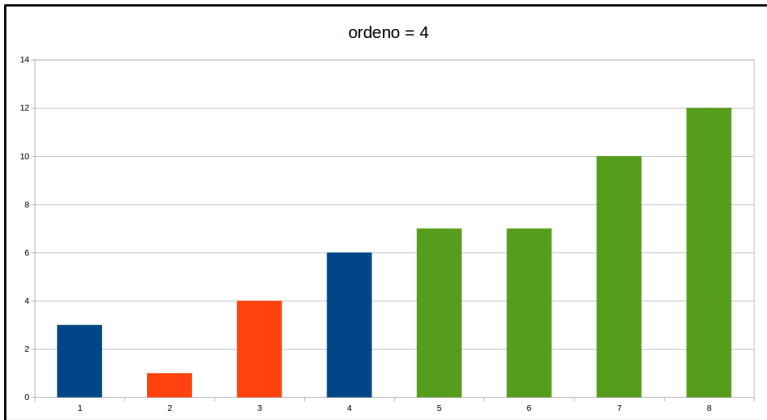


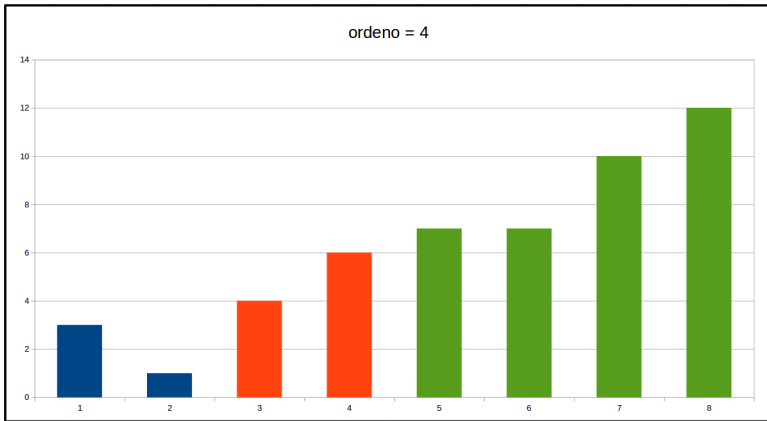


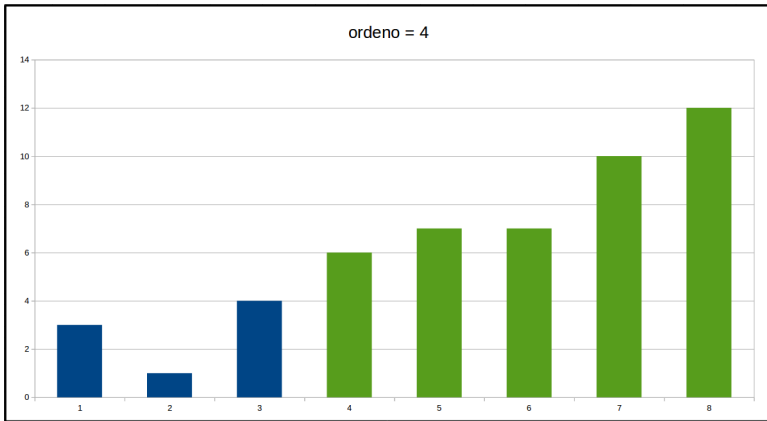


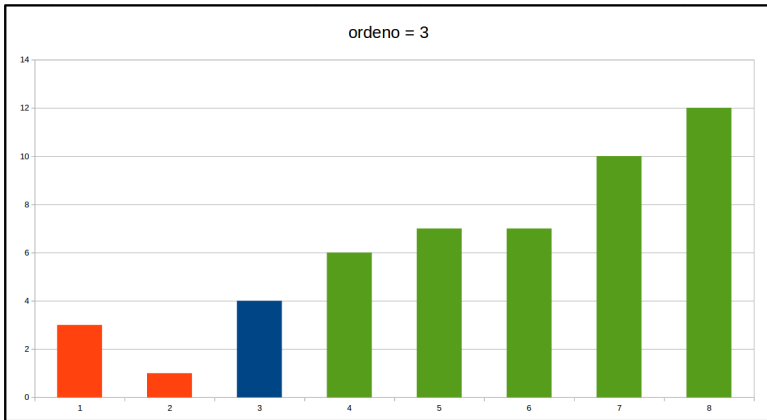


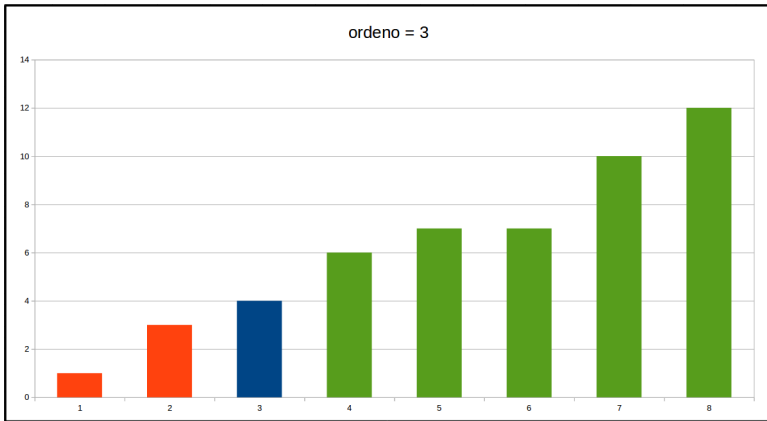


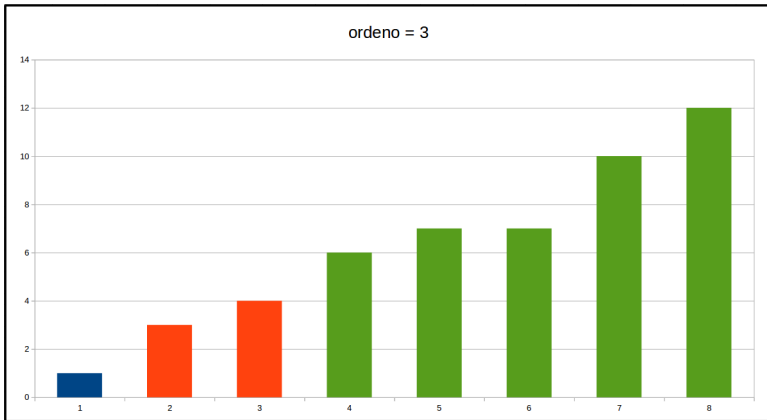


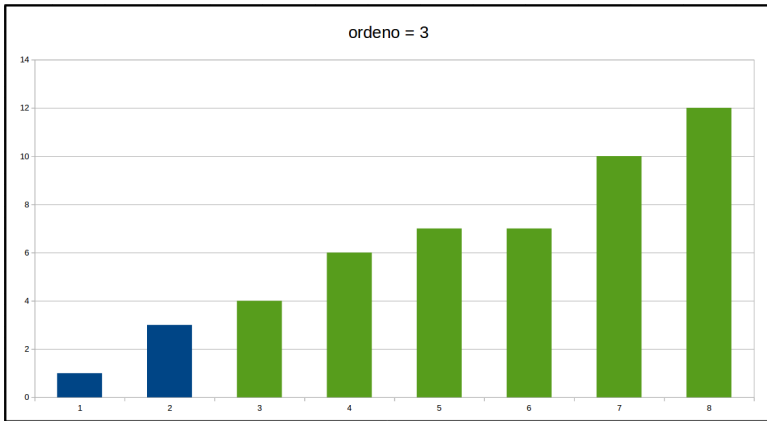


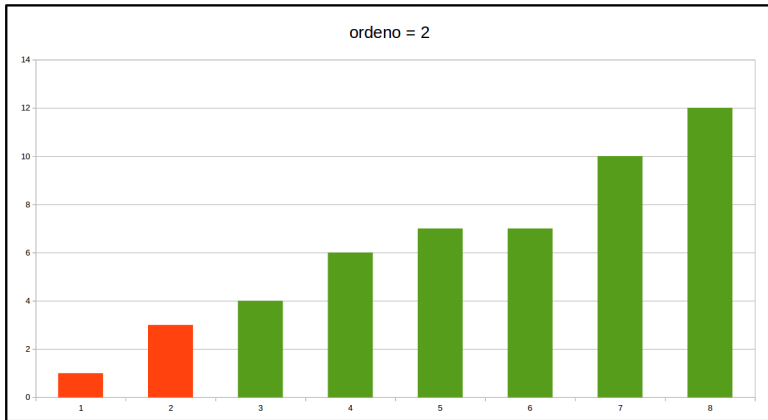


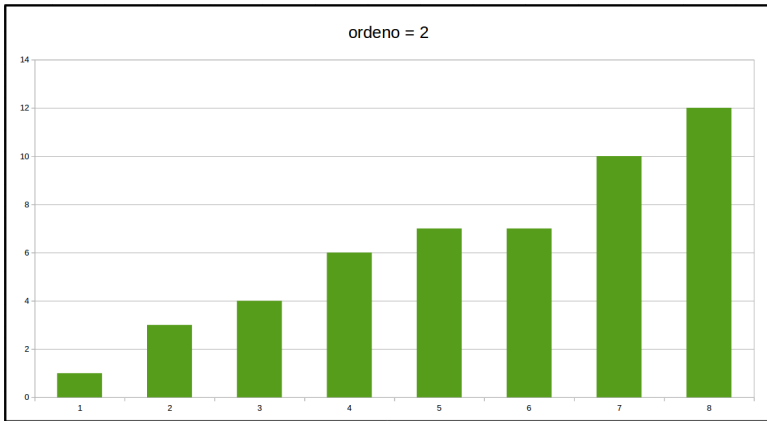












## Algoritmo Burbuja

### Variables

entero:  $n, i, j$   
real:  $V[10000], aux$

### Inicio

Leer ( $n$ ) // cantidad de elementos

Repetir para  $i \leftarrow 1, n$

Leer ( $V[i]$ )

fin para

Repetir para  $i \leftarrow n, 2, -1$  // ordenamiento

Repetir Para  $j \leftarrow 1, i-1$

Si ( $V[j] > V[j+1]$ ) entonces

aux  $\leftarrow V[j]$  // intercambiar

$V[j] \leftarrow V[j+1]$

$V[j+1] \leftarrow aux$

fin si

fin para

fin para

Repetir Para  $i \leftarrow 1, n$  // Mostrar vector ordenado

Escribir ( $V[i]$ )

fin para

Fin