LPG0001 – Linguagem de Programação

Ordenação usando SelectionSort

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 Ordenação (ou classificação) consiste em organizar os dados de um vetor em <u>ordem</u> <u>crescente</u> (ou decrescente);

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- Há dezenas de algortimos de ordenação, utilizados como base para análise de desempenho;
 - Complexidade de algoritmos;

- SelectionSort;
- BubbleSort;
- InsertionSort;
- QuickSort;
- MergeSort;
- •

SelectionSort

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SelectionSort

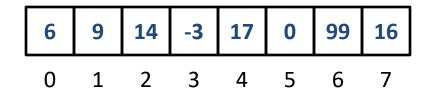
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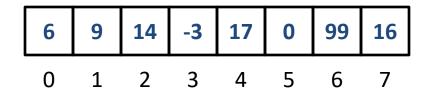
• O processo se repete com *i* de *0 até n-1*.

Exemplo 3: SelectionSort

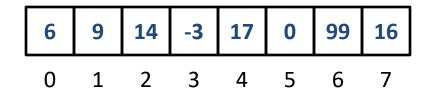
```
int vet[8] = \{6, 9, 14, -3, 17, 0, 99, 16\};
int n = 8;
int i, j;
for(i = 0; i < n-1; i++){
  int i menor = i;
  for(j = i+1 ; j < n ; j++)
    if( vet[j] < vet[i menor] )</pre>
      i menor = j;
  int aux = vet[i];
  vet[i] = vet[i menor];
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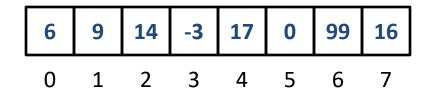
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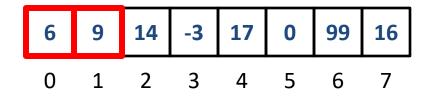
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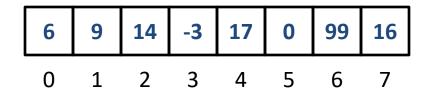


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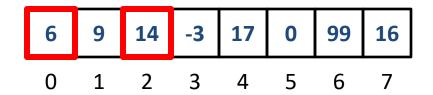
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0 i_menor
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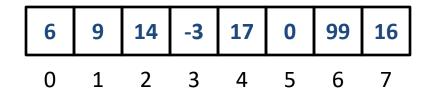
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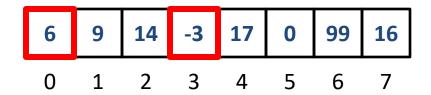
0 i_menor

2 | j

aux

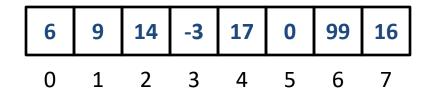


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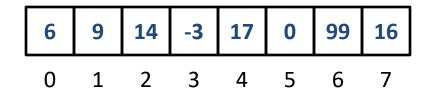
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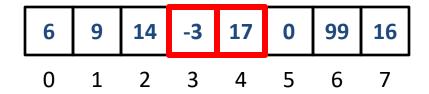


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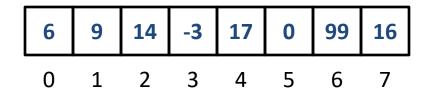


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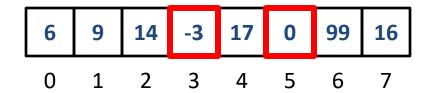


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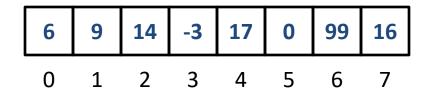
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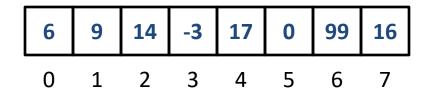
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aux



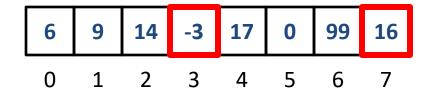
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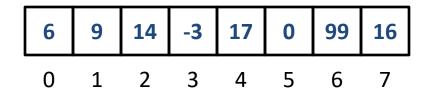
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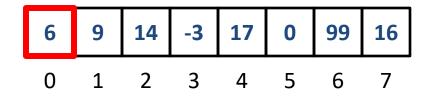


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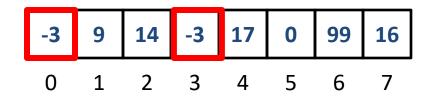


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- 0 j
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- 8 j
- 6 aux



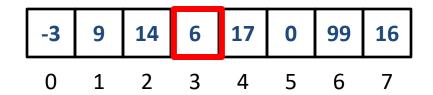
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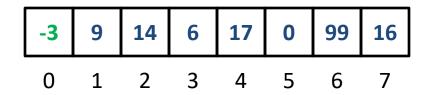
8 5

6 aux



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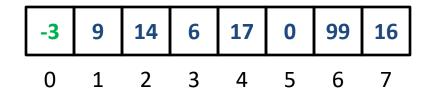
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3 i_menor

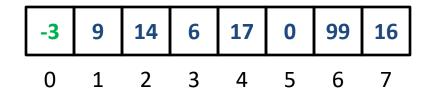
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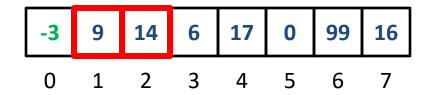
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1 | i

1 | i_menor

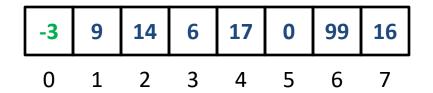
2 j

6 aux



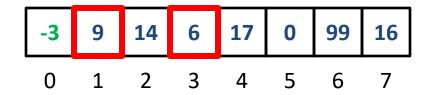
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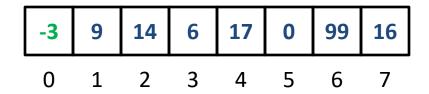


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1 i_menor

3 j

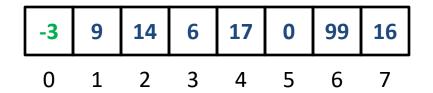


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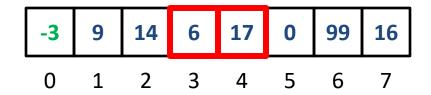


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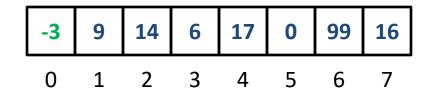
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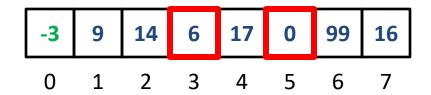
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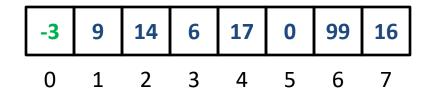
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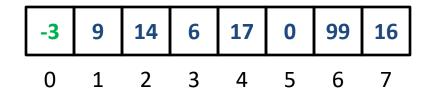
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- 5 i_menor
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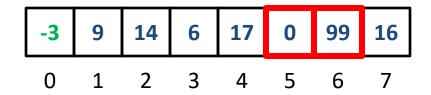


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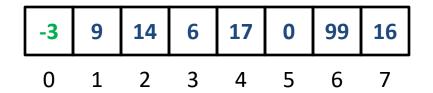


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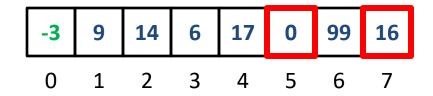
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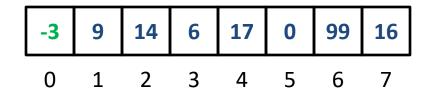


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 int i menor = i;
  for(j = i+1 ; j < n ; j++)
   if( vet[j] < vet[i menor] )</pre>
      i menor = j;
  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

1 | i

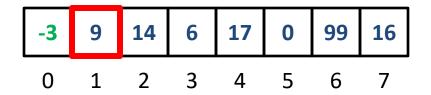
5 | i_menor

| **7** | j



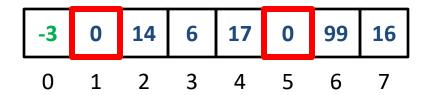
```
for(i = 0; i < n-1; i++){
  int i menor = i;
  for(j = i+1 ; j < n ; j++ )
    if( vet[j] < vet[i menor] )</pre>
      i menor = j;
  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

- 1 | i
- 5 i_menor
- 8 j
- 6 aux



```
for (i = 0 ; i < n-1 ; i++) {
  int i menor = i;
  for (j = i+1 ; j < n ; j++)
    if( vet[j] < vet[i_menor] )</pre>
      i menor = j;
 int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

- 1 | i
- 5 i_menor
- 8 5
- 9 aux

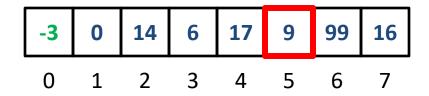


```
for(i = 0; i < n-1; i++){
  int i menor = i;
  for (j = i+1 ; j < n ; j++)
    if( vet[j] < vet[i_menor] )</pre>
      i menor = j;
  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

1 | i

5 | i_menor

8 | j

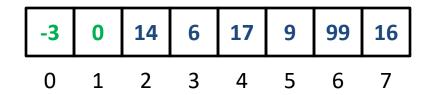


```
for(i = 0; i < n-1; i++){
  int i menor = i;
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  int aux = vet[i];
  vet[i] = vet[i menor];
 vet[i menor] = aux;
```

1 | i

5 | i_menor

8 j

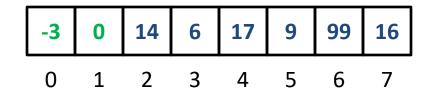


```
for(i = 0; i < n-1; i++){
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    if( vet[j] < vet[i_menor] )</pre>
      i menor = j;
  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

2

5 | i_menor

8 j

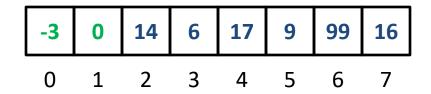


```
for(i = 0; i < n-1; i++){
  int i menor = i;
  for (j = i+1 ; j < n ; j++)
    if( vet[j] < vet[i_menor] )</pre>
      i menor = j;
  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

2 j

2 i_menor

8 j

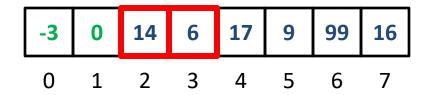


```
for(i = 0; i < n-1; i++){
  int i menor = i;
  for (j = i+1 ; j < n ; j++)
    if( vet[j] < vet[i menor] )</pre>
      i menor = j;
  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

2 j

2 i_menor

3 ј

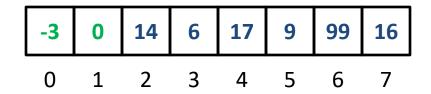


```
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   if( vet[j] < vet[i menor] )</pre>
      i menor = j;
  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

2 | i

2 i_menor

3 5

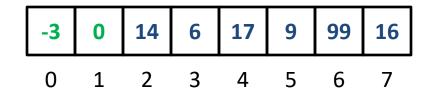


```
for(i = 0; i < n-1; i++){
  int i menor = i;
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      i menor = j;
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 vet[i menor] = aux;
```

2 i

3 i_menor

3 5



```
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  int i menor = i;
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    if( vet[j] < vet[i menor] )</pre>
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  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

2 j

3 | i_menor

4

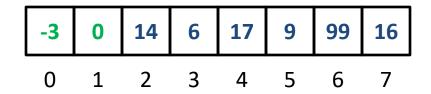


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 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

2 | i

3 i_menor

4 | j

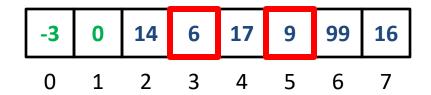


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  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

2 j

3 i_menor

5 j

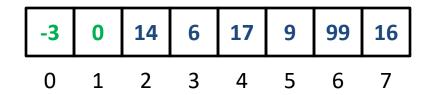


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 vet[i menor] = aux;
```

2 | i

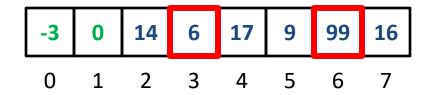
3 | i_menor

5 j



```
for(i = 0; i < n-1; i++){
  int i menor = i;
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 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

- 2 j
- 3 i_menor
- 6 j
- 9 aux

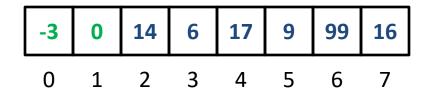


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      i menor = j;
  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

2 | i

3 i_menor

6 j

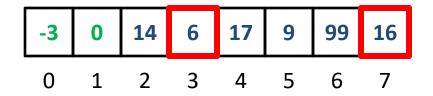


```
for(i = 0; i < n-1; i++){
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      i menor = j;
  int aux = vet[i];
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 vet[i menor] = aux;
```

2 | i

3 i_menor

7 j

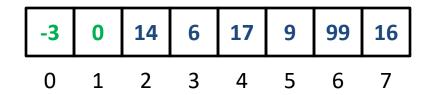


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 vet[i] = vet[i menor];
 vet[i menor] = aux;
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2 | i

3 | i_menor

7 | j

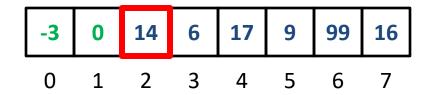


```
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  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

2 | i

3 | i_menor

8

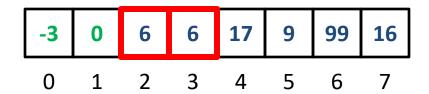


```
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 vet[i menor] = aux;
```

2 i

3 i_menor

8

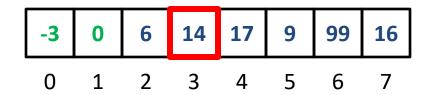


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for(i = 0; i < n-1; i++){
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  for (j = i+1 ; j < n ; j++)
    if( vet[j] < vet[i_menor] )</pre>
      i menor = j;
  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

2 | i

3 | i_menor

8 j

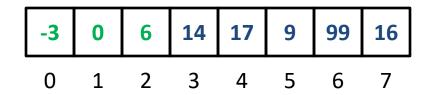


```
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    if( vet[j] < vet[i_menor] )</pre>
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  int aux = vet[i];
  vet[i] = vet[i menor];
 vet[i menor] = aux;
```

2 | i

5 | i_menor

8 j

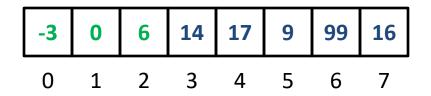


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      i menor = j;
  int aux = vet[i];
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 vet[i menor] = aux;
```

3

5 i_menor

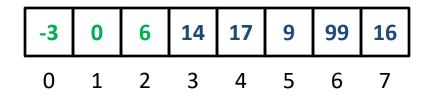
8 j



```
for(i = 0; i < n-1; i++){
  int i menor = i;
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      i menor = j;
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 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

3 i
3 i_menor

8 j



```
for(i = 0; i < n-1; i++){
  int i menor = i;
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      i menor = j;
  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

3 3

3 i_menor

4

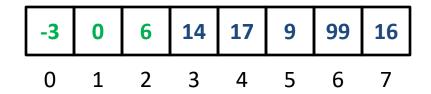


```
for(i = 0; i < n-1; i++){
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   if( vet[j] < vet[i menor] )</pre>
      i menor = j;
  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

3 i

3 i_menor

3 5

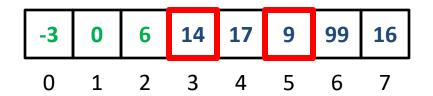


```
for(i = 0; i < n-1; i++){
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      i menor = j;
  int aux = vet[i];
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 vet[i menor] = aux;
```

3 | i

3 | i_menor

5 j

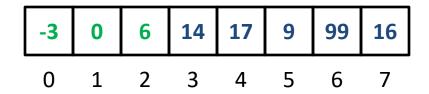


```
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```

3 i

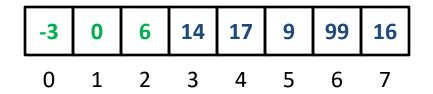
3 | i_menor

5 j



```
for(i = 0; i < n-1; i++){
  int i menor = i;
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      i menor = j;
  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

3 i5 i_menor5 j14 aux

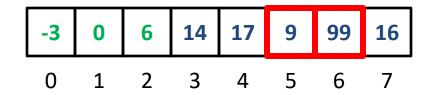


```
for(i = 0; i < n-1; i++){
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      i menor = j;
  int aux = vet[i];
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 vet[i menor] = aux;
```

3 | i

5 | i_menor

6

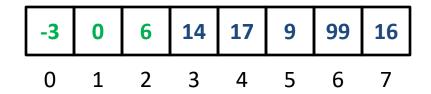


```
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```

3 | i

5 i_menor

6

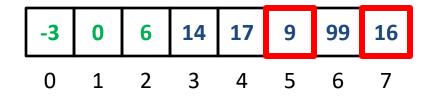


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```

3 | i

5 | i_menor

7

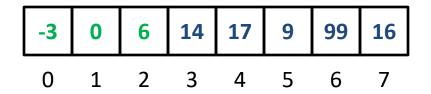


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3 i

5 i_menor

7 j

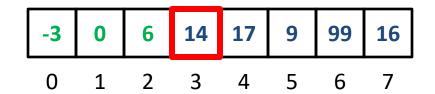


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3 i

5 i_menor

8 j

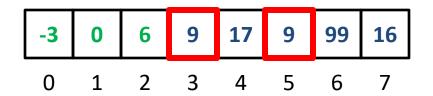


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3 i

5 | i_menor

8 j

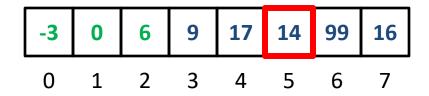


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 vet[i menor] = aux;
```

3 | j

5 | i_menor

8 j

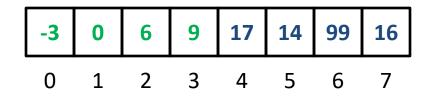


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3 j

5 | i_menor

8 j

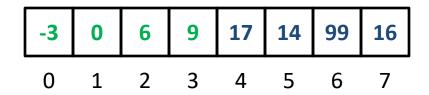


```
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      i menor = j;
  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

4

5 i_menor

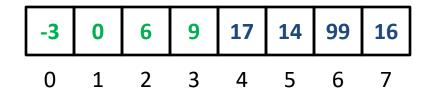
8 j



```
for(i = 0; i < n-1; i++){
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 vet[i menor] = aux;
```

4 i menor

8 5



```
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```

4 j

4 i_menor

5

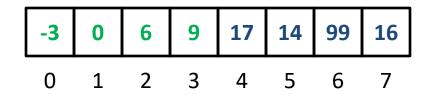


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```

4 i

4 i_menor

5 j

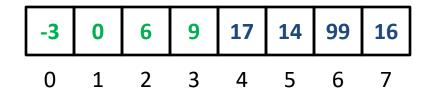


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```

4 | i

5 i_menor

5 j

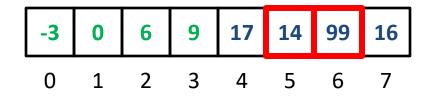


```
for(i = 0; i < n-1; i++){
  int i menor = i;
  for(j = i+1 ; j < n ; j++ )
    if( vet[j] < vet[i menor] )</pre>
      i menor = j;
  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

4 | i

5 | i_menor

6

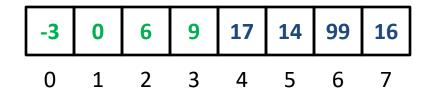


```
for(i = 0; i < n-1; i++){
 int i menor = i;
  for(j = i+1 ; j < n ; j++)
   if( vet[j] < vet[i menor] )</pre>
      i menor = j;
  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

4 | i

5 | i_menor

6 5

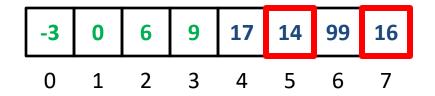


```
for(i = 0; i < n-1; i++){
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  for(j = i+1 ; j < n ; j++ )
    if( vet[j] < vet[i menor] )</pre>
      i menor = j;
  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

4 j

5 | i_menor

7 j

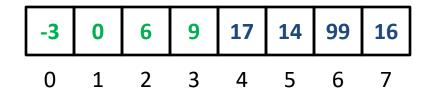


```
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4 j

5 | i_menor

7 | j



```
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      i menor = j;
  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

4 | i

5 i_menor

8



```
for(i = 0; i < n-1; i++){
  int i menor = i;
  for (j = i+1 ; j < n ; j++)
    if( vet[j] < vet[i_menor] )</pre>
      i menor = j;
 int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

4 j

5 | i_menor

8 j

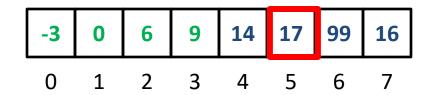


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for(i = 0; i < n-1; i++){
  int i menor = i;
  for (j = i+1 ; j < n ; j++)
    if( vet[j] < vet[i_menor] )</pre>
      i menor = j;
  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

4 | i

5 | i_menor

8 j

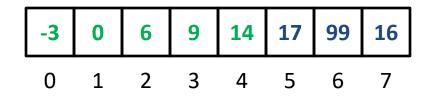


```
for(i = 0; i < n-1; i++){
  int i menor = i;
  for (j = i+1 ; j < n ; j++)
    if( vet[j] < vet[i_menor] )</pre>
      i menor = j;
  int aux = vet[i];
  vet[i] = vet[i menor];
 vet[i menor] = aux;
```

4 | i

5 | i_menor

8 j

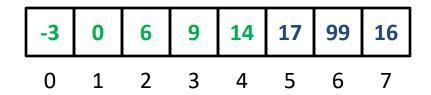


```
for(i = 0; i < n-1; i++){
  int i menor = i;
  for (j = i+1 ; j < n ; j++)
    if( vet[j] < vet[i_menor] )</pre>
      i menor = j;
  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

5 i

5 i_menor

8 5

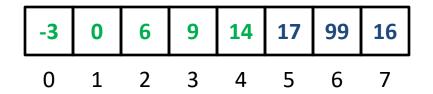


```
for(i = 0; i < n-1; i++){
  int i menor = i;
  for (j = i+1 ; j < n ; j++)
    if( vet[j] < vet[i_menor] )</pre>
      i menor = j;
  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

5 i

5 i_menor

8 5

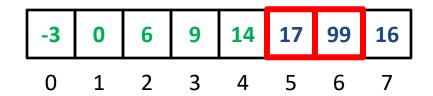


```
for(i = 0; i < n-1; i++){
  int i menor = i;
  for (j = i+1 ; j < n ; j++)
    if( vet[j] < vet[i menor] )</pre>
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  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

5 | i

5 | i_menor

6

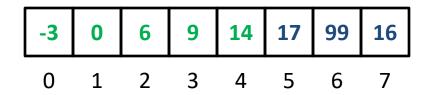


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   if( vet[j] < vet[i menor] )</pre>
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  int aux = vet[i];
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 vet[i menor] = aux;
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5 i

5 | i_menor

6

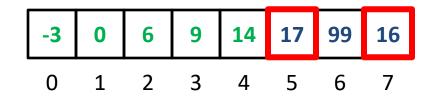


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      i menor = j;
  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

5 i

5 | i_menor

7 j

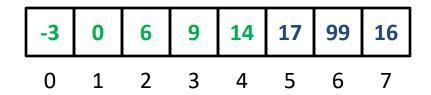


```
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      i menor = j;
  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

5 i

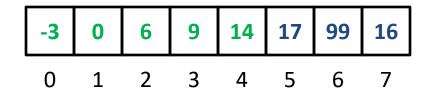
5 i_menor

| 7 | j



```
for(i = 0; i < n-1; i++){
  int i menor = i;
  for (j = i+1 ; j < n ; j++)
    if( vet[j] < vet[i_menor] )</pre>
      i menor = j;
  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

```
5 i7 i_menor7 j17 aux
```

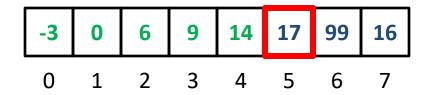


```
for(i = 0; i < n-1; i++){
  int i menor = i;
  for(j = i+1 ; j < n ; j++ )
    if( vet[j] < vet[i menor] )</pre>
      i menor = j;
  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

5 i

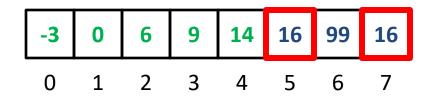
7 i_menor

8



```
for(i = 0; i < n-1; i++){
  int i menor = i;
  for (j = i+1 ; j < n ; j++)
    if( vet[j] < vet[i_menor] )</pre>
      i menor = j;
 int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

- 5 i
- 7 i_menor
- 8 j
- 17 aux

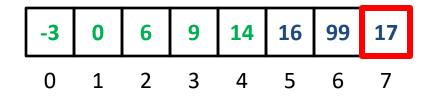


```
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  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

5 i

7 i_menor

8 j

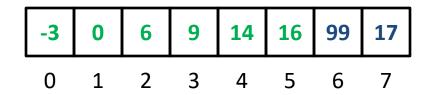


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  int aux = vet[i];
  vet[i] = vet[i menor];
 vet[i menor] = aux;
```

5 i

7 i_menor

8 j

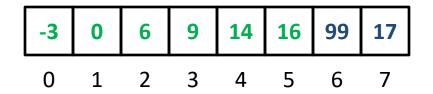


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for(i = 0; i < n-1; i++){
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    if( vet[j] < vet[i_menor] )</pre>
      i menor = j;
  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

6 i

7 i_menor

8 j

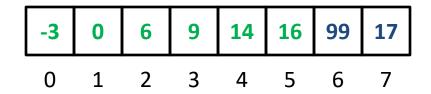


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for(i = 0; i < n-1; i++){
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  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

6 i

6 i_menor

8 | j

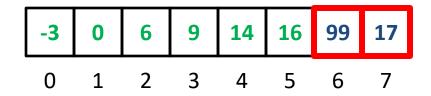


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 vet[i menor] = aux;
```

6 j

6 i_menor

7

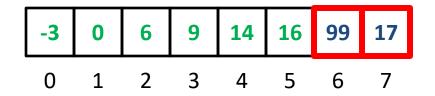


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```

6 i

6 i_menor

7 | j

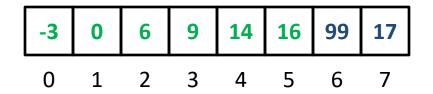


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  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

6 i

7 i_menor

7 | 5

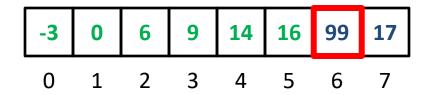


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for(i = 0; i < n-1; i++){
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6 i

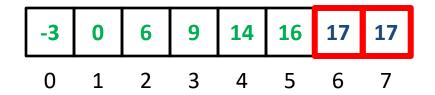
7 i_menor

8 j



```
for(i = 0; i < n-1; i++){
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      i menor = j;
 int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

- 6 i
- 7 i_menor
- 8 j
- 99 aux

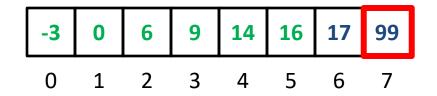


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  int aux = vet[i];
 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

6 j

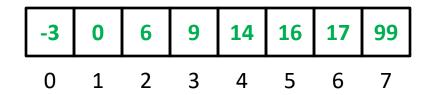
7 i_menor

8 j



```
for(i = 0; i < n-1; i++){
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- 6 i
- 7 i_menor
- 8 j
- 99 aux



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 vet[i] = vet[i menor];
 vet[i menor] = aux;
```

7 i

7 i_menor

8 | j

Atividades

 Pesquise e estude outros algoritmos de ordenação;

BubbleSort e InsertionSort são bem simples!