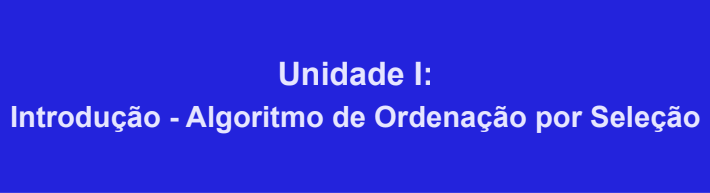
Trabalho Teórico 4



Slide C.

|  |  |
| --- | --- |
| for (int i = 0; i < (n - 1); i++) {      int menor = i;      for (int j = (i + 1); j < n; j++){          if (array[menor] > array[j]){              menor = j;          }      }      swap(menor, i);  } | 1)Faça com que  nosso código  conte o número de  movimentações? |

New code:

*int* mov = 0;

for (*int* i = 0; i < (n - 1); i++) {

*int* menor = i;

    for (*int* j = (i + 1); j < n; j++){

        if (array[menor] > array[j]){

            menor = j;

        }

    }

    swap(menor, i);

    mov += 3;

}

System.out.println(mov);

1- Mostre todas as comparações e movimentações do algoritmo anterior para o array abaixo:

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

= i

= J

= Menor

{

int menor = i;

for (int j = (i + 1); j < n; j++)

{

if (array[menor] > array[j])

{

menor = j;

}

}

swap(menor, i); }

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | 4 | 8 | 2 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 1 | 11 | 7 | 3 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | 4 | 8 | 2 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 1 | 11 | 7 | 3 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | 4 | 8 | 2 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 1 | 11 | 7 | 3 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | 4 | 8 | 2 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 1 | 11 | 7 | 3 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | 4 | 8 | 2 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 1 | 11 | 7 | 3 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | 4 | 8 | 2 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 1 | 11 | 7 | 3 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | 4 | 8 | 2 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 1 | 11 | 7 | 3 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | 4 | 8 | 2 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 1 | 11 | 7 | 3 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | 4 | 8 | 2 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 1 | 11 | 7 | 3 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | 4 | 8 | 2 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 1 | 11 | 7 | 3 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | 4 | 8 | 2 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 1 | 11 | 7 | 3 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| 12 | 4 | 8 | 2 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 1 | 11 | 7 | 3 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| 12 | 4 | 8 | 2 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 1 | 11 | 7 | 3 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| 12 | 4 | 8 | 2 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 1 | 11 | 7 | 3 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| 12 | 4 | 8 | 2 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 1 | 11 | 7 | 3 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| 12 | 4 | 8 | 2 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 1 | 11 | 7 | 3 |



|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| 12 | 4 | 8 | 2 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 1 | 11 | 7 | 3 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | 4 | 8 | 2 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 1 | 11 | 7 | 3 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | 4 | 8 | 2 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 1 | 11 | 7 | 3 |

TROCA: Realizada pelo Swap( i , menor );

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 4 | 8 | 2 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 12 | 11 | 7 | 3 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 4 | 8 | 2 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 12 | 11 | 7 | 3 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 4 | 8 | 2 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 12 | 11 | 7 | 3 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | 4 | 8 | 2 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 12 | 11 | 7 | 3 |

TROCA: Realizada pelo Swap( i , menor );

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 8 | 4 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 12 | 11 | 7 | 3 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 8 | 4 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 12 | 11 | 7 | 3 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 8 | 4 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 12 | 11 | 7 | 3 |

TROCA: Realizada pelo Swap( i , menor );

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 12 | 11 | 7 | 8 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 12 | 11 | 7 | 8 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 12 | 11 | 7 | 8 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 12 | 11 | 7 | 8 |

TROCA: Realizada pelo Swap( i , menor );

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 12 | 11 | 7 | 8 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 12 | 11 | 7 | 8 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 12 | 11 | 7 | 8 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 12 | 11 | 7 | 8 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 14 | 17 | 6 | 18 | 10 | 16 | 15 | 5 | 13 | 9 | 12 | 11 | 7 | 8 |

TROCA: Realizada pelo Swap( i , menor );

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 17 | 6 | 18 | 10 | 16 | 15 | 14 | 13 | 9 | 12 | 11 | 7 | 8 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 17 | 6 | 18 | 10 | 16 | 15 | 14 | 13 | 9 | 12 | 11 | 7 | 8 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 17 | 6 | 18 | 10 | 16 | 15 | 14 | 13 | 9 | 12 | 11 | 7 | 8 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 17 | 6 | 18 | 10 | 16 | 15 | 14 | 13 | 9 | 12 | 11 | 7 | 8 |

TROCA: Realizada pelo Swap( i , menor );

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 17 | 18 | 10 | 16 | 15 | 14 | 13 | 9 | 12 | 11 | 7 | 8 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 17 | 18 | 10 | 16 | 15 | 14 | 13 | 9 | 12 | 11 | 7 | 8 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 17 | 18 | 10 | 16 | 15 | 14 | 13 | 9 | 12 | 11 | 7 | 8 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 17 | 18 | 10 | 16 | 15 | 14 | 13 | 9 | 12 | 11 | 7 | 8 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 17 | 18 | 10 | 16 | 15 | 14 | 13 | 9 | 12 | 11 | 7 | 8 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 17 | 18 | 10 | 16 | 15 | 14 | 13 | 9 | 12 | 11 | 7 | 8 |

TROCA: Realizada pelo Swap( i , menor );

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 18 | 10 | 16 | 15 | 14 | 13 | 9 | 12 | 11 | 17 | 8 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 18 | 10 | 16 | 15 | 14 | 13 | 9 | 12 | 11 | 17 | 8 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 18 | 10 | 16 | 15 | 14 | 13 | 9 | 12 | 11 | 17 | 8 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 18 | 10 | 16 | 15 | 14 | 13 | 9 | 12 | 11 | 17 | 8 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 18 | 10 | 16 | 15 | 14 | 13 | 9 | 12 | 11 | 17 | 8 |

TROCA: Realizada pelo Swap( i , menor );

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 10 | 16 | 15 | 14 | 13 | 9 | 12 | 11 | 17 | 18 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 10 | 16 | 15 | 14 | 13 | 9 | 12 | 11 | 17 | 18 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 10 | 16 | 15 | 14 | 13 | 9 | 12 | 11 | 17 | 18 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 10 | 16 | 15 | 14 | 13 | 9 | 12 | 11 | 17 | 18 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 10 | 16 | 15 | 14 | 13 | 9 | 12 | 11 | 17 | 18 |

TROCA: Realizada pelo Swap( i , menor );

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 16 | 15 | 14 | 13 | 10 | 12 | 11 | 17 | 18 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 16 | 15 | 14 | 13 | 10 | 12 | 11 | 17 | 18 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 16 | 15 | 14 | 13 | 10 | 12 | 11 | 17 | 18 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 16 | 15 | 14 | 13 | 10 | 12 | 11 | 17 | 18 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 16 | 15 | 14 | 13 | 10 | 12 | 11 | 17 | 18 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 16 | 15 | 14 | 13 | 10 | 12 | 11 | 17 | 18 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 16 | 15 | 14 | 13 | 10 | 12 | 11 | 17 | 18 |

TROCA: Realizada pelo Swap( i , menor );

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 15 | 14 | 13 | 16 | 12 | 11 | 17 | 18 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 15 | 14 | 13 | 16 | 12 | 11 | 17 | 18 |

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 15 | 14 | 13 | 16 | 12 | 11 | 17 | 18 |

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 15 | 14 | 13 | 16 | 12 | 11 | 17 | 18 |

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 15 | 14 | 13 | 16 | 12 | 11 | 17 | 18 |

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 15 | 14 | 13 | 16 | 12 | 11 | 17 | 18 |

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 15 | 14 | 13 | 16 | 12 | 11 | 17 | 18 |

TROCA: Realizada pelo Swap( i , menor );

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 14 | 13 | 16 | 12 | 15 | 17 | 18 |

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 14 | 13 | 16 | 12 | 15 | 17 | 18 |

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 14 | 13 | 16 | 12 | 15 | 17 | 18 |

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 14 | 13 | 16 | 12 | 15 | 17 | 18 |

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 14 | 13 | 16 | 12 | 15 | 17 | 18 |

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 14 | 13 | 16 | 12 | 15 | 17 | 18 |

TROCA: Realizada pelo Swap( i , menor );

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 16 | 14 | 15 | 17 | 18 |

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 16 | 14 | 15 | 17 | 18 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 16 | 14 | 15 | 17 | 18 |

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 16 | 14 | 15 | 17 | 18 |

TROCA: Realizada pelo Swap( i , menor );

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 16 | 14 | 15 | 17 | 18 |

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 16 | 14 | 15 | 17 | 18 |

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 16 | 14 | 15 | 17 | 18 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 16 | 14 | 15 | 17 | 18 |

TROCA: Realizada pelo Swap( i , menor );

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 16 | 15 | 17 | 18 |

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 16 | 15 | 17 | 18 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 16 | 15 | 17 | 18 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 16 | 15 | 17 | 18 |

TROCA: Realizada pelo Swap( i , menor );

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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |

O vetor já está ordenado mais as comparações acontecerão mais 2x ate o fim do programa.

VETOR ORDENADO NO FIM.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |

2Execute a versão abaixo do Seleção para arrays gerados aleatoriamente. Em seguida, discuta sobre os números de comparações inseridas e movimentações evitadas pela nova versão do algoritmo

for (int i = 0; i < (n - 1); i++) {

    int menor = i;

    for (int j = (i + 1); j < n; j++){

        if (array[menor] > array[j]){

    menor = j;

    }

}

    if (menor != i){

        swap(menor, i);

    }

}

Resp: Serão inseridas N-1 comparações a mais, com o intuito reduzir o número de trocas, mas vale em teoria mais apena pagar a movimentação do que a comparações. Média do tempo de execução dos códigos de Arraes de 100 000 posições.

Teste:

Sem if(10.451)

Com if(8.450)

3) Contabilize os números de comparações e movimentações entre elementos do array; calcule os valores teóricos para as duas métricas; e contabilize o tempo de execução. Em seguida, para os códigos em Java e C, gere arrays aleatórios (seed 0) com tamanhos 100, 1000 e 10000. Para cada instância (variação de linguagem e tamanho de vetor), faça 33 execuções. Faça um gráfico para os valores médios de cada métrica avaliada comparação, movimentações e tempo de execução) variando o tamanho do array. Nos gráficos de comparações e movimentações, mostre também os resultados teóricos. Cada gráfico terá uma curva para cada linguagem. Interprete os resultados obtidos. Repita o processo para arrays gerados de forma crescente e decrescente.