1)

A)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | V | | | | | i | j | v[j]>v[j+1]? |
| [0] | [1] | [2] | [3] | [4] |
| 5 | ~~7~~ ~~2~~ | ~~2~~ ~~7~~ | ~~5~~ | ~~4~~ | 9 | ~~4~~ | ~~0~~ | V |
|  |  | ~~5~~ | ~~7~~ |  |  |  | ~~1~~ | V |
|  |  |  | ~~4~~ | 7 |  |  | ~~2~~ | V |
|  |  |  |  |  |  |  | ~~3~~ | F |
|  |  |  |  |  |  | ~~3~~ | ~~0~~ | F |
|  |  | 4 | 5 |  |  |  | ~~1~~ | V |
|  |  |  |  |  |  |  | ~~2~~ | F |
|  |  |  |  |  |  | 2 | 0 | F |
|  |  |  |  |  |  |  | 1 | F |
|  |  |  |  |  |  | 1 | 0 | F |

B)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | V | | | | | i | j | v[j]>v[j+1]? |
| [0] | [1] | [2] | [3] | [4] |
| 5 | ~~7 5~~ | ~~5 7~~ | ~~5~~ | ~~3~~ | 9 | ~~4~~ | ~~0~~ | V |
|  |  | ~~5~~ | ~~7~~ |  |  |  | ~~1~~ | V |
|  |  |  | ~~3~~ | 7 |  |  | ~~2~~ | V |
|  |  |  |  |  |  |  | ~~3~~ | F |
|  |  |  |  |  |  | ~~3~~ | ~~0~~ | F |
|  |  | ~~3~~ | 5 |  |  |  | ~~1~~ | V |
|  |  |  |  |  |  |  | ~~2~~ | F |
|  | 3 | 5 |  |  |  | 2 | 0 | V |
|  |  |  |  |  |  |  | 1 | F |
|  |  |  |  |  |  | 1 | 0 | F |

C)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | V | | | | | i | j | v[j]>v[j+1]? |
| [0] | [1] | [2] | [3] | [4] |
| 4 | 1 | 2 | 3 | 4 |  | ~~3~~ | ~~0~~ | F |
|  |  |  |  |  |  |  | ~~1~~ | F |
|  |  |  |  |  |  |  | ~~2~~ | F |
|  |  |  |  |  |  | ~~2~~ | ~~0~~ | F |
|  |  |  |  |  |  |  | ~~1~~ | F |
|  |  |  |  |  |  | 1 | 0 | F |

D)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N | V | | | | | i | j | v[j]>v[j+1]? |
| [0] | [1] | [2] | [3] | [4] |
| 4 | ~~4~~ 3 | ~~3~~ 4 | 2 | 1 |  | ~~3~~ | ~~0~~ | V |
|  |  | ~~2~~ | ~~4~~ |  |  |  | ~~1~~ | V |
|  |  |  | ~~1~~ | 4 |  |  | ~~2~~ | V |
|  | ~~2~~ | ~~3~~ |  |  |  | ~~2~~ | ~~0~~ | V |
|  |  | ~~1~~ | 3 |  |  |  | ~~1~~ | V |
|  | 1 | 2 |  |  |  | 1 | 0 | V |

2) 10 comparações e 5 trocas

3) O selection realiza menos trocas, porém o bubble não precisa verificar cada uma das opções antes de mudar.