

Análise e Desenvolvimento de Sistemas

Manhã – ADSMA3

Estrutura de Dados

Exercício de Ordenação

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1. Modifique o algoritmo de ordenação por contagem para que possa ordenar sequências com números repetidos.

//protótipo: void ordenaRepetidos(int origem[],int dest[],int tam)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 3 | 1 | 1 | 3 | 2 | 3 | 1 | 2 |

|  |
| --- |
| **void ordenaRepetidos(int origem[],int dest[],int tam) {**  **int i, j, p;**  ***//determinar a posição de cada elemento no vetor ordenado***  **for(i = 0; i < tam; i++){**  **p = 0;**  **for(j = 0; j < tam; j++)**  **if (origem[i] > origem[j])**  **p++;**  ***//ajusta a posição do vetor caso a variável atual já exista no vetor de destino***  **while(dest[p] == origem[i]) p++;**  **dest[p] = origem[i];**  **}**  **}** |

1. Dado o vetor

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 11 | 37 | 8 | 43 | 29 | 18 | 41 | 51 | 25 |

1. Simule a execução do bubble sort até que o quinto passo (tam=5)

Resposta:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 11 | 18 | 29 | 25 | 37 | 41 | 43 | 51 |

Teste de mesa:

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | **v[ ]** | | | | | | | | |
| **trocou** | **tam** | **i** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| - | 9 | - | 11 | 37 | 8 | 43 | 29 | 18 | 41 | 51 | 25 |
| 0 | 8 | 0 | 11 | 37 | 8 | 43 | 29 | 18 | 41 | 51 | 25 |
| 0 | 8 | 1 | 11 | 37 | 8 | 43 | 29 | 18 | 41 | 51 | 25 |
| 1 | 8 | 2 | 11 | 8 | 37 | 43 | 29 | 18 | 41 | 51 | 25 |
| 1 | 8 | 3 | 11 | 8 | 37 | 43 | 29 | 18 | 41 | 51 | 25 |
| 1 | 8 | 4 | 11 | 8 | 37 | 29 | 43 | 18 | 41 | 51 | 25 |
| 1 | 8 | 5 | 11 | 8 | 37 | 29 | 18 | 43 | 41 | 51 | 25 |
| 1 | 8 | 6 | 11 | 8 | 37 | 29 | 18 | 41 | 43 | 51 | 25 |
| 1 | 8 | 7 | 11 | 8 | 37 | 29 | 18 | 41 | 43 | 51 | 25 |
| 0 | 7 | 0 | 11 | 8 | 37 | 29 | 18 | 41 | 43 | 25 | 51 |
| 1 | 7 | 1 | 8 | 11 | 37 | 29 | 18 | 41 | 43 | 25 | 51 |
| 1 | 7 | 2 | 8 | 11 | 37 | 29 | 18 | 41 | 43 | 25 | 51 |
| 1 | 7 | 3 | 8 | 11 | 29 | 37 | 18 | 41 | 43 | 25 | 51 |
| 1 | 7 | 4 | 8 | 11 | 29 | 18 | 37 | 41 | 43 | 25 | 51 |
| 1 | 7 | 5 | 8 | 11 | 29 | 18 | 37 | 41 | 43 | 25 | 51 |
| 1 | 7 | 6 | 8 | 11 | 29 | 18 | 37 | 41 | 43 | 25 | 51 |
| 0 | 6 | 0 | 8 | 11 | 29 | 18 | 37 | 41 | 25 | 43 | 51 |
| 0 | 6 | 1 | 8 | 11 | 29 | 18 | 37 | 41 | 25 | 43 | 51 |
| 1 | 6 | 2 | 8 | 11 | 29 | 18 | 37 | 41 | 25 | 43 | 51 |
| 1 | 6 | 3 | 8 | 11 | 18 | 29 | 37 | 41 | 25 | 43 | 51 |
| 1 | 6 | 4 | 8 | 11 | 18 | 29 | 37 | 41 | 25 | 43 | 51 |
| 1 | 6 | 5 | 8 | 11 | 18 | 29 | 37 | 41 | 25 | 43 | 51 |
| 0 | 5 | 0 | 8 | 11 | 18 | 29 | 37 | 25 | 41 | 43 | 51 |
| 0 | 5 | 1 | 8 | 11 | 18 | 29 | 37 | 25 | 41 | 43 | 51 |
| 0 | 5 | 2 | 8 | 11 | 18 | 29 | 37 | 25 | 41 | 43 | 51 |
| 0 | 5 | 3 | 8 | 11 | 18 | 29 | 37 | 25 | 41 | 43 | 51 |
| 1 | 5 | 4 | 8 | 11 | 18 | 29 | 37 | 25 | 41 | 43 | 51 |
|  |  |  | 8 | 11 | 18 | 29 | 25 | 37 | 41 | 43 | 51 |

1. Simule a execução do selection sort até que o quinto passo.(i=5)

Resposta:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 11 | 18 | 25 | 29 | 37 | 41 | 51 | 43 |

Teste de mesa:

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | **num[ ]** | | | | | | | | |
| **min** | **i** | **j** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| - | - | - | 11 | 37 | 8 | 43 | 29 | 18 | 41 | 51 | 25 |
| 0 | 0 | 1 | 11 | 37 | 8 | 43 | 29 | 18 | 41 | 51 | 25 |
| 0 | 0 | 2 | 11 | 37 | 8 | 43 | 29 | 18 | 41 | 51 | 25 |
| 2 | 0 | 3 | 11 | 37 | 8 | 43 | 29 | 18 | 41 | 51 | 25 |
| 2 | 0 | 4 | 11 | 37 | 8 | 43 | 29 | 18 | 41 | 51 | 25 |
| 2 | 0 | 5 | 11 | 37 | 8 | 43 | 29 | 18 | 41 | 51 | 25 |
| 2 | 0 | 6 | 11 | 37 | 8 | 43 | 29 | 18 | 41 | 51 | 25 |
| 2 | 0 | 7 | 11 | 37 | 8 | 43 | 29 | 18 | 41 | 51 | 25 |
| 2 | 0 | 8 | 11 | 37 | 8 | 43 | 29 | 18 | 41 | 51 | 25 |
| 2 | 0 | 9 | 8 | 37 | 11 | 43 | 29 | 18 | 41 | 51 | 25 |
| 1 | 1 | 2 | 8 | 37 | 11 | 43 | 29 | 18 | 41 | 51 | 25 |
| 2 | 1 | 3 | 8 | 37 | 11 | 43 | 29 | 18 | 41 | 51 | 25 |
| 2 | 1 | 4 | 8 | 37 | 11 | 43 | 29 | 18 | 41 | 51 | 25 |
| 2 | 1 | 5 | 8 | 37 | 11 | 43 | 29 | 18 | 41 | 51 | 25 |
| 2 | 1 | 6 | 8 | 37 | 11 | 43 | 29 | 18 | 41 | 51 | 25 |
| 2 | 1 | 7 | 8 | 37 | 11 | 43 | 29 | 18 | 41 | 51 | 25 |
| 2 | 1 | 8 | 8 | 37 | 11 | 43 | 29 | 18 | 41 | 51 | 25 |
| 2 | 1 | 9 | 8 | 11 | 37 | 43 | 29 | 18 | 41 | 51 | 25 |
| 2 | 2 | 3 | 8 | 11 | 37 | 43 | 29 | 18 | 41 | 51 | 25 |
| 2 | 2 | 4 | 8 | 11 | 37 | 43 | 29 | 18 | 41 | 51 | 25 |
| 4 | 2 | 5 | 8 | 11 | 37 | 43 | 29 | 18 | 41 | 51 | 25 |
| 5 | 2 | 6 | 8 | 11 | 37 | 43 | 29 | 18 | 41 | 51 | 25 |
| 5 | 2 | 7 | 8 | 11 | 37 | 43 | 29 | 18 | 41 | 51 | 25 |
| 5 | 2 | 8 | 8 | 11 | 37 | 43 | 29 | 18 | 41 | 51 | 25 |
| 5 | 2 | 9 | 8 | 11 | 18 | 43 | 29 | 37 | 41 | 51 | 25 |
| 3 | 3 | 4 | 8 | 11 | 18 | 43 | 29 | 37 | 41 | 51 | 25 |
| 4 | 3 | 5 | 8 | 11 | 18 | 43 | 29 | 37 | 41 | 51 | 25 |
| 4 | 3 | 6 | 8 | 11 | 18 | 43 | 29 | 37 | 41 | 51 | 25 |
| 4 | 3 | 7 | 8 | 11 | 18 | 43 | 29 | 37 | 41 | 51 | 25 |
| 4 | 3 | 8 | 8 | 11 | 18 | 43 | 29 | 37 | 41 | 51 | 25 |
| 8 | 3 | 9 | 8 | 11 | 18 | 25 | 29 | 37 | 41 | 51 | 43 |
| 4 | 4 | 5 | 8 | 11 | 18 | 25 | 29 | 37 | 41 | 51 | 43 |
| 4 | 4 | 6 | 8 | 11 | 18 | 25 | 29 | 37 | 41 | 51 | 43 |
| 4 | 4 | 7 | 8 | 11 | 18 | 25 | 29 | 37 | 41 | 51 | 43 |
| 4 | 4 | 8 | 8 | 11 | 18 | 25 | 29 | 37 | 41 | 51 | 43 |
| 4 | 4 | 9 | 8 | 11 | 18 | 25 | 29 | 37 | 41 | 51 | 43 |
| 5 | 5 | 6 | 8 | 11 | 18 | 25 | 29 | 37 | 41 | 51 | 43 |
| 5 | 5 | 7 | 8 | 11 | 18 | 25 | 29 | 37 | 41 | 51 | 43 |
| 5 | 5 | 8 | 8 | 11 | 18 | 25 | 29 | 37 | 41 | 51 | 43 |
| 5 | 5 | 9 | 8 | 11 | 18 | 25 | 29 | 37 | 41 | 51 | 43 |
|  |  |  | 8 | 11 | 18 | 25 | 29 | 37 | 41 | 51 | 43 |

1. Simule a execução do insertion sort até que o quarto passo (j=4)

Resposta:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 11 | 29 | 37 | 43 | 18 | 41 | 51 | 25 |

Teste de mesa:

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | **v[ ]** | | | | | | | | |
| **chave** | **i** | **j** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| - | - | - | 11 | 37 | 8 | 43 | 29 | 18 | 41 | 51 | 25 |
| 37 | 0 | 1 | 11 | 37 | 8 | 43 | 29 | 18 | 41 | 51 | 25 |
| 37 | 0 | 1 | 11 | 37 | 8 | 43 | 29 | 18 | 41 | 51 | 25 |
| 37 | 0 | 1 | 11 | 37 | 8 | 43 | 29 | 18 | 41 | 51 | 25 |
| 8 | 1 | 2 | 11 | 37 | 8 | 43 | 29 | 18 | 41 | 51 | 25 |
| 8 | 1 | 2 | 11 | 37 | 8 | 43 | 29 | 18 | 41 | 51 | 25 |
| 8 | 0 | 2 | 11 | 37 | 37 | 43 | 29 | 18 | 41 | 51 | 25 |
| 8 | 0 | 2 | 11 | 37 | 37 | 43 | 29 | 18 | 41 | 51 | 25 |
| 8 | -1 | 2 | 11 | 11 | 37 | 43 | 29 | 18 | 41 | 51 | 25 |
| 8 | -1 | 2 | 8 | 11 | 37 | 43 | 29 | 18 | 41 | 51 | 25 |
| 43 | 2 | 3 | 8 | 11 | 37 | 43 | 29 | 18 | 41 | 51 | 25 |
| 43 | 2 | 3 | 8 | 11 | 37 | 43 | 29 | 18 | 41 | 51 | 25 |
| 43 | 2 | 3 | 8 | 11 | 37 | 43 | 29 | 18 | 41 | 51 | 25 |
| 29 | 3 | 4 | 8 | 11 | 37 | 43 | 29 | 18 | 41 | 51 | 25 |
| 29 | 3 | 4 | 8 | 11 | 37 | 43 | 29 | 18 | 41 | 51 | 25 |
| 29 | 2 | 4 | 8 | 11 | 37 | 43 | 43 | 18 | 41 | 51 | 25 |
| 29 | 2 | 4 | 8 | 11 | 37 | 43 | 43 | 18 | 41 | 51 | 25 |
| 29 | 1 | 4 | 8 | 11 | 37 | 37 | 43 | 18 | 41 | 51 | 25 |
| 29 | 1 | 4 | 8 | 11 | 37 | 37 | 43 | 18 | 41 | 51 | 25 |
| 29 | 1 | 4 | 8 | 11 | 29 | 37 | 43 | 18 | 41 | 51 | 25 |
|  |  |  | 8 | 11 | 29 | 37 | 43 | 18 | 41 | 51 | 25 |

1. Simule a execução do quick sort até a primeira chamada recursiva.

Resposta:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 11 | 25 | 8 | 18 | 29 | 43 | 41 | 51 | 37 |

Teste de mesa:

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | **v[ ]** | | | | | | | | |
| **m** | **i** | **j** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| - | - | - | 11 | 37 | 8 | 43 | 29 | 18 | 41 | 51 | 25 |
| 29 | 0 | 8 | 11 | 37 | 8 | 43 | 29 | 18 | 41 | 51 | 25 |
| 29 | 0 | 8 | 11 | 37 | 8 | 43 | 29 | 18 | 41 | 51 | 25 |
| 29 | 1 | 8 | 11 | 37 | 8 | 43 | 29 | 18 | 41 | 51 | 25 |
| 29 | 1 | 8 | 11 | 37 | 8 | 43 | 29 | 18 | 41 | 51 | 25 |
| 29 | 2 | 7 | 11 | 25 | 8 | 43 | 29 | 18 | 41 | 51 | 37 |
| 29 | 2 | 7 | 11 | 25 | 8 | 43 | 29 | 18 | 41 | 51 | 37 |
| 29 | 3 | 7 | 11 | 25 | 8 | 43 | 29 | 18 | 41 | 51 | 37 |
| 29 | 3 | 7 | 11 | 25 | 8 | 43 | 29 | 18 | 41 | 51 | 37 |
| 29 | 3 | 6 | 11 | 25 | 8 | 43 | 29 | 18 | 41 | 51 | 37 |
| 29 | 3 | 5 | 11 | 25 | 8 | 43 | 29 | 18 | 41 | 51 | 37 |
| 29 | 4 | 4 | 11 | 25 | 8 | 18 | 29 | 43 | 41 | 51 | 37 |
| 29 | 4 | 4 | 11 | 25 | 8 | 18 | 29 | 43 | 41 | 51 | 37 |
| 29 | 4 | 4 | 11 | 25 | 8 | 18 | 29 | 43 | 41 | 51 | 37 |
| 29 | 5 | 3 | 11 | 25 | 8 | 18 | 29 | 43 | 41 | 51 | 37 |
|  |  |  | 11 | 25 | 8 | 18 | 29 | 43 | 41 | 51 | 37 |