Sistemas Operativos

2022/2023

Licenciatura em Engenharia Informática

Relatório Técnico Trabalho Prático #1 – O problema do Knapsack (mochila)

Turma: 2ºL_EI-SW-01

Horário de laboratório: 2ªf 16h30

Docente: Aníbal Ponte

Grupo:

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Tabelas de resultados para os testes fornecidos

ex_04_11_test:

```
#Test|Test File (#Items)|Execution Time|#Processes|Best Value|Weights Sum.|Achieved Best|#Iterations|Time to Best Value
    1| ex04_11.txt (  4)|            10|         5|        23|          11|         Yes|         15|                 0
    2| ex04_11.txt (  4)|            10|         5|        23|          11|         Yes|         10|                 0
    3| ex04_11.txt (  4)|            10|         5|        23|          11|         Yes|          5|                 0
    4| ex04_11.txt (  4)|            10|         5|        23|          11|         Yes|          8|                 0
    5| ex04_11.txt (  4)|            10|         5|        23|          11|         Yes|         36|                 0
    6| ex04_11.txt (  4)|            10|         5|        23|          11|         Yes|         45|                 0
    7| ex04_11.txt (  4)|            10|         5|        23|          11|         Yes|         17|                 0
    8| ex04_11.txt (  4)|            10|         5|        23|          11|         Yes|         87|                 0
    9| ex04_11.txt (  4)|            10|         5|        23|          11|         Yes|         39|                 0
   10| ex04_11.txt (  4)|            10|         5|        23|          11|         Yes|         56|                 0
                                                             Achieved Times: 10|Avg. Iterations: 31|Avg. Time: 0
```

ex05_test:

```
#Test|Test File (#Items)|Execution Time|#Processes|Best Value|Weights Sum.|Achieved Best|#Iterations|Time to Best Value
   1|    ex05.txt (   5)|           10|        5|      130|         60|         Yes|         25|                 0
   2|    ex05.txt (   5)|           10|        5|      130|         60|         Yes|         77|                 0
   3|    ex05.txt (   5)|           10|        5|      130|         60|         Yes|         59|                 0
   4|    ex05.txt (   5)|           10|        5|      130|         60|         Yes|        107|                 0
   5|    ex05.txt (   5)|           10|        5|      130|         60|         Yes|         55|                 0
   6|    ex05.txt (   5)|           10|        5|      130|         60|         Yes|         27|                 0
   7|    ex05.txt (   5)|           10|        5|      130|         60|         Yes|         19|                 0
   8|    ex05.txt (   5)|           10|        5|      130|         60|         Yes|        111|                 0
   9|    ex05.txt (   5)|           10|        5|      130|         60|         Yes|         32|                 0
  10|    ex05.txt (   5)|           10|        5|      130|         60|         Yes|         22|                 0
                                                              Achieved Times: 10|Avg. Iterations: 53|Avg. Time: 0
```

ex07_test:

```
#Test|Test File (#Items)|Execution Time|#Processes|Best Value|Weights Sum.|Achieved Best|#Iterations|Time to Best Value
   1|    ex07.txt (   7)|           10|        5|      107|         50|         Yes|         45|                 0
   2|    ex07.txt (   7)|           10|        5|      107|         50|         Yes|         33|                 0
   3|    ex07.txt (   7)|           10|        5|      107|         50|         Yes|        308|                 0
   4|    ex07.txt (   7)|           10|        5|      107|         50|         Yes|         24|                 0
   5|    ex07.txt (   7)|           10|        5|      107|         50|         Yes|        246|                 0
   6|    ex07.txt (   7)|           10|        5|      107|         50|         Yes|         91|                 0
   7|    ex07.txt (   7)|           10|        5|      107|         50|         Yes|        461|                 0
   8|    ex07.txt (   7)|           10|        5|      107|         50|         Yes|        121|                 0
   9|    ex07.txt (   7)|           10|        5|      107|         50|         Yes|        315|                 0
  10|    ex07.txt (   7)|           10|        5|      107|         50|         Yes|        142|                 0
                                                              Achieved Times: 10|Avg. Iterations: 178|Avg. Time: 0
```

ex08_test:

```
#Test|Test File (#Items)|Execution Time|#Processes|Best Value|Weights Sum.|Achieved Best|#Iterations|Time to Best Value
   1|    ex08.txt (   8)|           10|        5|      280|        102|         Yes|        279|                 0
   2|    ex08.txt (   8)|           10|        5|      280|        102|         Yes|        148|                 0
   3|    ex08.txt (   8)|           10|        5|      280|        102|         Yes|        154|                 0
   4|    ex08.txt (   8)|           10|        5|      280|        102|         Yes|         96|                 0
   5|    ex08.txt (   8)|           10|        5|      280|        102|         Yes|        714|                 0
   6|    ex08.txt (   8)|           10|        5|      280|        102|         Yes|        212|                 0
   7|    ex08.txt (   8)|           10|        5|      280|        102|         Yes|       1157|                 0
   8|    ex08.txt (   8)|           10|        5|      280|        102|         Yes|        338|                 0
   9|    ex08.txt (   8)|           10|        5|      280|        102|         Yes|        182|                 0
  10|    ex08.txt (   8)|           10|        5|      280|        102|         Yes|        172|                 0
                                                              Achieved Times: 10|Avg. Iterations: 345|Avg. Time: 0
```

ex10_269_test:

```
#Test|Test File (#Items)|Execution Time|#Processes|Best Value|Weights Sum.|Achieved Best|#Iterations|Time to Best Value
   1|ex10_269.txt ( 10)|           10|        5|      295|        269|         Yes|       1078|                 0
   2|ex10_269.txt ( 10)|           10|        5|      295|        269|         Yes|       1611|                 0
   3|ex10_269.txt ( 10)|           10|        5|      295|        269|         Yes|       1819|                 0
   4|ex10_269.txt ( 10)|           10|        5|      295|        269|         Yes|       1430|                 0
   5|ex10_269.txt ( 10)|           10|        5|      295|        269|         Yes|         37|                 0
   6|ex10_269.txt ( 10)|           10|        5|      295|        269|         Yes|       1467|                 0
   7|ex10_269.txt ( 10)|           10|        5|      295|        269|         Yes|        996|                 0
   8|ex10_269.txt ( 10)|           10|        5|      295|        269|         Yes|        168|                 0
   9|ex10_269.txt ( 10)|           10|        5|      295|        269|         Yes|       2032|                 0
  10|ex10_269.txt ( 10)|           10|        5|      295|        269|         Yes|        964|                 0
                                                              Achieved Times: 10|Avg. Iterations: 1160|Avg. Time: 0
```

ex20_878_test:

```
#Test|Test File (#Items)|Execution Time|#Processes|Best Value|Weights Sum.|Achieved Best|#Iterations|Time to Best Value
   1|ex20_878.txt ( 20)|           10|        5|     1024|        871|         Yes|    2816381|                 1
   2|ex20_878.txt ( 20)|           10|        5|     1024|        871|         Yes|     610687|                 0
   3|ex20_878.txt ( 20)|           10|        5|     1024|        871|         Yes|    5406917|                 3
   4|ex20_878.txt ( 20)|           10|        5|     1024|        871|         Yes|    1289847|                 0
   5|ex20_878.txt ( 20)|           10|        5|     1024|        871|         Yes|    1870613|                 1
   6|ex20_878.txt ( 20)|           10|        5|     1024|        871|         Yes|     894337|                 0
   7|ex20_878.txt ( 20)|           10|        5|     1024|        871|         Yes|     330641|                 0
   8|ex20_878.txt ( 20)|           10|        5|     1024|        871|         Yes|    1882213|                 1
   9|ex20_878.txt ( 20)|           10|        5|     1024|        871|         Yes|     211038|                 0
  10|ex20_878.txt ( 20)|           10|        5|     1024|        871|         Yes|     354544|                 0
                                                              Achieved Times: 10|Avg. Iterations: 1566721|Avg. Time: 0
```

ex23_test:

```
#Test|Test File (#Items)|Execution Time|#Processes|Best Value|Weights Sum.|Achieved Best|#Iterations|Time to Best Value
    1|    ex23.txt ( 23)|          10|        5|      9767|       9768|         Yes|    1487338|                 0
    2|    ex23.txt ( 23)|          10|        5|      9767|       9768|         Yes|    1028382|                 0
    3|    ex23.txt ( 23)|          10|        5|      9767|       9768|         Yes|    2487464|                 1
    4|    ex23.txt ( 23)|          10|        5|      9767|       9768|         Yes|    4183815|                 2
    5|    ex23.txt ( 23)|          10|        5|      9767|       9768|         Yes|    3811854|                 2
    6|    ex23.txt ( 23)|          10|        5|      9767|       9768|         Yes|     360774|                 0
    7|    ex23.txt ( 23)|          10|        5|      9767|       9768|         Yes|     681946|                 0
    8|    ex23.txt ( 23)|          10|        5|      9767|       9768|         Yes|    2403529|                 1
    9|    ex23.txt ( 23)|          10|        5|      9767|       9768|         Yes|    1984970|                 1
   10|    ex23.txt ( 23)|          10|        5|      9767|       9768|         Yes|    1280393|                 0
                                         Achieved Times: 10|Avg. Iterations: 1971046|Avg. Time: 0
```

ex25_test:

```
#Test|Test File (#Items)|Execution Time|#Processes|Best Value|Weights Sum.|Achieved Best|#Iterations|Time to Best Value
    1|    ex25.txt ( 25)|           5|        5|      4053|        655|          No|    6890691|                 4
    2|    ex25.txt ( 25)|           5|        5|      4049|        580|          No|    5385734|                 3
    3|    ex25.txt ( 25)|           5|        5|      4087|        478|          No|    5209723|                 3
    4|    ex25.txt ( 25)|           5|        5|      4049|        580|          No|    7212525|                 4
    5|    ex25.txt ( 25)|           5|        5|      3809|        658|          No|    2796178|                 1
    6|    ex25.txt ( 25)|           5|        5|      4087|        478|          No|    2513041|                 1
    7|    ex25.txt ( 25)|           5|        5|      3957|        680|          No|     519880|                 0
    8|    ex25.txt ( 25)|           5|        5|      3846|        639|          No|    3374621|                 2
    9|    ex25.txt ( 25)|           5|        5|      4049|        580|          No|    6929483|                 4
   10|    ex25.txt ( 25)|           5|        5|      4506|        623|         Yes|     975363|                 0
                                         Achieved Times: 1|Avg. Iterations: 4180723|Avg. Time: 2
```

ex30_test:

```
#Test|Test File (#Items)|Execution Time|#Processes|Best Value|Weights Sum.|Achieved Best|#Iterations|Time to Best Value
    1|    ex30.txt ( 30)|          10|        5|      3955|        734|          No|    9409733|                 7
    2|    ex30.txt ( 30)|          10|        5|      4026|        708|          No|    4473050|                 3
    3|    ex30.txt ( 30)|          10|        5|      3712|        717|          No|     293827|                 0
    4|    ex30.txt ( 30)|          10|        5|      3488|        748|          No|     247757|                 0
    5|    ex30.txt ( 30)|          10|        5|      4048|        733|          No|    2954827|                 2
    6|    ex30.txt ( 30)|          10|        5|      4263|        734|          No|    3879156|                 2
    7|    ex30.txt ( 30)|          10|        5|      4263|        734|          No|    3778658|                 2
    8|    ex30.txt ( 30)|          10|        5|      4509|        730|         Yes|    1497227|                 1
    9|    ex30.txt ( 30)|          10|        5|      3715|        614|          No|    6133774|                 4
   10|    ex30.txt ( 30)|          10|        5|      3315|        685|          No|    6072242|                 4
                                         Achieved Times: 1|Avg. Iterations: 3874025|Avg. Time: 2
```

ex40_test:

```
#Test|Test File (#Items)|Execution Time|#Processes|Best Value|Weights Sum.|Achieved Best|#Iterations|Time to Best Value
    1|    ex40.txt ( 40)|          10|        5|      3382|        880|          No|    6101836|                 6
    2|    ex40.txt ( 40)|          10|        5|      3565|        844|          No|    4308863|                 4
    3|    ex40.txt ( 40)|          10|        5|      5010|        860|          No|    4079954|                 4
    4|    ex40.txt ( 40)|          10|        5|         0|          0|          No|          0|                 0
    5|    ex40.txt ( 40)|          10|        5|      5165|        561|          No|    2580996|                 2
    6|    ex40.txt ( 40)|          10|        5|         0|          0|          No|          0|                 0
    7|    ex40.txt ( 40)|          10|        5|      3752|        786|          No|    4578724|                 4
    8|    ex40.txt ( 40)|          10|        5|      2399|        178|          No|    3115751|                 3
    9|    ex40.txt ( 40)|          10|        5|      3546|        804|          No|    8944591|                 8
   10|    ex40.txt ( 40)|          10|        5|      5250|        851|          No|    5058556|                 5
                                         Achieved Times: 0|Avg. Iterations: 3876927|Avg. Time: 3
```

ex50_1_test:

```
#Test|Test File (#Items)|Execution Time|#Processes|Best Value|Weights Sum.|Achieved Best|#Iterations|Time to Best Value
    1|   ex50_1.txt ( 50)|          10|        5|         0|          0|          No|          0|                 0
    2|   ex50_1.txt ( 50)|          10|        5|         0|          0|          No|          0|                 0
    3|   ex50_1.txt ( 50)|          10|        5|         0|          0|          No|          0|                 0
    4|   ex50_1.txt ( 50)|          10|        5|         0|          0|          No|          0|                 0
    5|   ex50_1.txt ( 50)|          10|        5|         0|          0|          No|          0|                 0
    6|   ex50_1.txt ( 50)|          10|        5|         0|          0|          No|          0|                 0
    7|   ex50_1.txt ( 50)|          10|        5|         0|          0|          No|          0|                 0
    8|   ex50_1.txt ( 50)|          10|        5|         0|          0|          No|          0|                 0
    9|   ex50_1.txt ( 50)|          10|        5|         0|          0|          No|          0|                 0
   10|   ex50_1.txt ( 50)|          10|        5|         0|          0|          No|          0|                 0
                                         Achieved Times: 0|Avg. Iterations: 0|Avg. Time: 0
```

Descrições das soluções: O algoritmo é eficiente e encontra todas as soluções até nº items = 23; a partir desse valor começa não só a diminuir a sua eficiência até não encontrar nenhuma, mas também aumenta bastante o nº de iterações.