Sistemas Operativos

2022/2023

Licenciatura em Engenharia Informática

Relatório Técnico Trabalho Prático #2 – 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

Teste Algoritmo Base 100 Items:

```
################################################ Base Algorithm ################################################
 # |        Test (#items) | Exec. Time (ms) | #Threads | Best Value | Best Weight | Time to Best Value (ms) | #Iterations
 1 |    ex100_1.txt (  100) |           5015 |       5 |      9147 |        985 |                     67 |          1
 2 |    ex100_1.txt (  100) |           5004 |       5 |      9147 |        985 |                      1 |          1
 3 |    ex100_1.txt (  100) |           5013 |       5 |      9147 |        985 |                      0 |          1
 4 |    ex100_1.txt (  100) |           5014 |       5 |      9147 |        985 |                      0 |          1
 5 |    ex100_1.txt (  100) |           5003 |       5 |      9147 |        985 |                      0 |          1
 6 |    ex100_1.txt (  100) |           5013 |       5 |      9147 |        985 |                      0 |          1
 7 |    ex100_1.txt (  100) |           5010 |       5 |      9147 |        985 |                      0 |          1
 8 |    ex100_1.txt (  100) |           5009 |       5 |      9147 |        985 |                      0 |          1
 9 |    ex100_1.txt (  100) |           5006 |       5 |      9147 |        985 |                      0 |          1
10 |    ex100_1.txt (  100) |           5003 |       5 |      9147 |        985 |                      1 |          1
################################################################################################################
                    Avg. Time: 6.90 ms   Avg. Iterations: 1.00   # Achieved Best Result : 10
```

Teste Algoritmo Avançado 100 Items:

```
############################################## Advanced Algorithm ##############################################
 # |        Test (#items) | Exec. Time (ms) | #Threads | Best Value | Best Weight | Time to Best Value (ms) | #Iterations
 1 |    ex100_1.txt (  100) |           5011 |       5 |      9147 |        985 |                     77 |          1
 2 |    ex100_1.txt (  100) |           5004 |       5 |      9147 |        985 |                      0 |          1
 3 |    ex100_1.txt (  100) |           5003 |       5 |      9147 |        985 |                      0 |          1
 4 |    ex100_1.txt (  100) |           5002 |       5 |      9147 |        985 |                      0 |          1
 5 |    ex100_1.txt (  100) |           5001 |       5 |      9147 |        985 |                      0 |          1
 6 |    ex100_1.txt (  100) |           5001 |       5 |      9147 |        985 |                      0 |          1
 7 |    ex100_1.txt (  100) |           5001 |       5 |      9147 |        985 |                      0 |          1
 8 |    ex100_1.txt (  100) |           5001 |       5 |      9147 |        985 |                      1 |          1
 9 |    ex100_1.txt (  100) |           5001 |       5 |      9147 |        985 |                      0 |          1
10 |    ex100_1.txt (  100) |           5001 |       5 |      9147 |        985 |                      1 |          1
################################################################################################################
                    Avg. Time: 7.90 ms   Avg. Iterations: 1.00   # Achieved Best Result : 10
```

Teste Algoritmo Base 1000 Items:

```
################################################ Base Algorithm ################################################
 # |        Test (#items) | Exec. Time (ms) | #Threads | Best Value | Best Weight | Time to Best Value (ms) | #Iterations
 1 |   ex1000_1.txt ( 1000) |           5057 |       5 |     54503 |       5002 |                   1468 |          3
 2 |   ex1000_1.txt ( 1000) |           5012 |       5 |     54503 |       5002 |                    962 |          2
 3 |   ex1000_1.txt ( 1000) |           5022 |       5 |     54503 |       5002 |                    994 |          3
 4 |   ex1000_1.txt ( 1000) |           5015 |       5 |     54503 |       5002 |                   1082 |          3
 5 |   ex1000_1.txt ( 1000) |           5021 |       5 |     54503 |       5002 |                   1201 |          3
 6 |   ex1000_1.txt ( 1000) |           5015 |       5 |     54503 |       5002 |                   1104 |          3
 7 |   ex1000_1.txt ( 1000) |           5007 |       5 |     54503 |       5002 |                   1185 |          3
 8 |   ex1000_1.txt ( 1000) |           5018 |       5 |     54503 |       5002 |                   1030 |          3
 9 |   ex1000_1.txt ( 1000) |           5008 |       5 |     54503 |       5002 |                   1257 |          3
10 |   ex1000_1.txt ( 1000) |           5022 |       5 |     54503 |       5002 |                   1202 |          3
################################################################################################################
                    Avg. Time: 1148.50 ms   Avg. Iterations: 2.90   # Achieved Best Result : 10
```

Teste Algoritmo Avançado 1000 Items:

```
############################################### Advanced Algorithm ###############################################
 # |         Test (#items) | Exec. Time (ms) | #Threads | Best Value | Best Weight | Time to Best Value (ms) | #Iterations
 1 |    ex1000_1.txt ( 1000) |            5060 |        5 |      54503 |        5002 |                     964 |           1
 2 |    ex1000_1.txt ( 1000) |            5007 |        5 |      54503 |        5002 |                     844 |           2
 3 |    ex1000_1.txt ( 1000) |            5007 |        5 |      54503 |        5002 |                     997 |           3
 4 |    ex1000_1.txt ( 1000) |            5006 |        5 |      54503 |        5002 |                     771 |           2
 5 |    ex1000_1.txt ( 1000) |            5007 |        5 |      54503 |        5002 |                    1020 |           3
 6 |    ex1000_1.txt ( 1000) |            5007 |        5 |      54503 |        5002 |                     751 |           2
 7 |    ex1000_1.txt ( 1000) |            5007 |        5 |      54503 |        5002 |                     756 |           2
 8 |    ex1000_1.txt ( 1000) |            5005 |        5 |      54503 |        5002 |                     936 |           3
 9 |    ex1000_1.txt ( 1000) |            5005 |        5 |      54503 |        5002 |                    1044 |           3
10 |    ex1000_1.txt ( 1000) |            5006 |        5 |      54503 |        5002 |                     982 |           3
############################################################################################################
          Avg. Time: 906.50 ms   Avg. Iterations: 2.40   # Achieved Best Result : 10
```

Teste Algoritmo Base 5000 Items:

```
############################################### Base Algorithm ###############################################
 # |         Test (#items) | Exec. Time (ms) | #Threads | Best Value | Best Weight | Time to Best Value (ms) | #Iterations
 1 |    ex5000_1.txt ( 5000) |           60474 |        5 |     276457 |       25016 |                   29644 |           2
 2 |    ex5000_1.txt ( 5000) |           60324 |        5 |     276457 |       25016 |                   33636 |           3
 3 |    ex5000_1.txt ( 5000) |           60167 |        5 |     276457 |       25016 |                   32709 |           3
 4 |    ex5000_1.txt ( 5000) |           60178 |        5 |     276457 |       25016 |                   32584 |           3
 5 |    ex5000_1.txt ( 5000) |           60165 |        5 |     276457 |       25016 |                   29388 |           2
 6 |    ex5000_1.txt ( 5000) |           60172 |        5 |     276457 |       25016 |                   33769 |           3
 7 |    ex5000_1.txt ( 5000) |           60161 |        5 |     276457 |       25016 |                   32830 |           3
 8 |    ex5000_1.txt ( 5000) |           60173 |        5 |     276457 |       25016 |                   24696 |           2
 9 |    ex5000_1.txt ( 5000) |           60155 |        5 |     276457 |       25016 |                   31498 |           3
10 |    ex5000_1.txt ( 5000) |           60156 |        5 |     276457 |       25016 |                   34255 |           3
############################################################################################################
          Avg. Time: 31500.90 ms   Avg. Iterations: 2.70   # Achieved Best Result : 10
```

Teste Algoritmo Avançado 5000 Items:

```
############################################### Advanced Algorithm ###############################################
 # |         Test (#items) | Exec. Time (ms) | #Threads | Best Value | Best Weight | Time to Best Value (ms) | #Iterations
 1 |    ex5000_1.txt ( 5000) |           60490 |        5 |     276457 |       25016 |                   29843 |           2
 2 |    ex5000_1.txt ( 5000) |           60361 |        5 |     276457 |       25016 |                   31966 |           3
 3 |    ex5000_1.txt ( 5000) |           60151 |        5 |     276457 |       25016 |                   27786 |           2
 4 |    ex5000_1.txt ( 5000) |           60143 |        5 |     276457 |       25016 |                   32211 |           3
 5 |    ex5000_1.txt ( 5000) |           60533 |        5 |     276457 |       25016 |                   29652 |           2
 6 |    ex5000_1.txt ( 5000) |           60150 |        5 |     276457 |       25016 |                   33318 |           2
 7 |    ex5000_1.txt ( 5000) |           60135 |        5 |     276457 |       25016 |                   30627 |           2
 8 |    ex5000_1.txt ( 5000) |           60152 |        5 |     276457 |       25016 |                   28709 |           2
 9 |    ex5000_1.txt ( 5000) |           60135 |        5 |     276457 |       25016 |                   33911 |           2
10 |    ex5000_1.txt ( 5000) |           60146 |        5 |     276457 |       25016 |                   31131 |           2
############################################################################################################
          Avg. Time: 30915.40 ms   Avg. Iterations: 2.20   # Achieved Best Result : 10
```

Descrições das soluções: Os algoritmos conseguem encontrar todas as soluções num intervalo de tempo relativamente baixo (inferior a 10 segundos) até aos 1000 items. A partir deste valor, embora ainda encontrem todas as soluções, o tempo de descoberta das mesmas incrementa para aproximadamente 30 segundos, tratando-se, assim, de um aumento considerável.