**BT3: Knapsack**



**ĐẠI HỌC QUỐC GIA THÀNH PHỐ HỒ CHÍ MINH**

**TRƯỜNG ĐẠI HỌC CÔNG NGHỆ THÔNG TIN**

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**TRÍ TUỆ NHÂN TẠO**

**GVHD: Lương Ngọc Hoàng**

**Lớp: CS106.O21**

**Tên: Lê Minh Nhựt**

**MSSV: 22521060**



**Bảng so sánh các nhóm testcase**

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| --- | --- | --- | --- |
| **Tên Testcase** | **Giá trị** | **Tổng trọng lượng** | **Tối ưu** |
| **00Uncorrelated** |  |  |  |
| /n00050/R10000/s023.kp | 184146 | 136791 | ✓ |
| /n00100/R10000/s023.kp | 397170 | 243454 | ✓ |
| /n00200/R10000/s023.kp | 791932 | 525855 | ✓ |
| /n00500/R10000/s018.kp | 2042604 | 1244410 | ✓ |
| /n01000/R01000/s060.kp | 396658 | 254485 | ✓ |
| /n02000/R10000/s087.kp | 7930410 | 5034713 | ✓ |
| /n05000/R10000/s003.kp | 20171425 | 12456172 | ✓ |
| /n10000/R01000/s068.kp | 4119623 | 2456211 | ✓ |
| **01WeaklyCorrelated** |  |  |  |
| /n00050/R01000/s003.kp | 14805 | 13206 | ✓ |
| /n00100/R01000/s003.kp | 29073 | 26809 | ✓ |
| /n00200/R01000/s003.kp | 55912 | 50852 | ✓ |
| /n00500/R01000/s001.kp | 138098 | 123764 | ✓ |
| /n01000/R10000/s021.kp | 2754845 | 2494424 | ✓ |
| /n02000/R10000/s075.kp | 5453486 | 4928687 | ✓ |
| /n05000/R01000/s010.kp | 1370823 | 1244058 | ✓ |
| /n10000/R10000/s031.kp | 27624962 | 25008094 | ✓ |
| **02StronglyCorrelated** |  |  |  |
| /n00050/R10000/s037.kp | 160943 | 126943 | ✓ |
| /n00100/R01000/s097.kp | 31950 | 24950 | ✓ |
| /n00200/R01000/s018.kp | 64093 | 50193 | x |
| /n00500/R10000/s051.kp | 1607734 | 1257734 | x |
| /n01000/R01000/s002.kp | 319438 | 249438 | x |
| /n02000/R10000/s017.kp | 6372264 | 4965264 | x |
| /n05000/R10000/s017.kp | 15920402 | 12417402 | x |
| /n10000/R10000/s017.kp | 31707235 | 24675235 | x |
| **03InverseStronglyCorrelated** |  |  |  |
| /n00050/R01000/s054.kp | 13485 | 15085 | ✓ |
| /n00100/R10000/s011.kp | 253403 | 283403 | ✓ |
| /n00200/R01000/s025.kp | 51376 | 57576 | x |
| /n00500/R10000/s019.kp | 1314892 | 1471892 | x |
| /n01000/R10000/s012.kp | 2671635 | 2988635 | x |
| /n02000/R10000/s061.kp | 5247561 | 5869561 | x |
| /n05000/R10000/s061.kp | 13250017 | 14824017 | x |
| /n10000/R10000/s061.kp | 26483279 | 29629279 | x |
| **04AlmostStronglyCorrelated** |  |  |  |
| /n00050/R10000/s012.kp | 151166 | 116207 | ✓ |
| /n00100/R10000/s030.kp | 326671 | 258739 | ✓ |
| /n00200/R01000/s000.kp | 65385 | 51563 | x |
| /n00500/R10000/s011.kp | 1613683 | 1264582 | x |
| /n01000/R10000/s064.kp | 3178169 | 2474163 | x |
| /n02000/R01000/s096.kp | 642360 | 502977 | x |
| /n05000/R01000/s096.kp | 1594805 | 1244484 | ✓ |
| /n05000/R10000/s057.kp | 15920682 | 12402028 | x |
| /n10000/R01000/s096.kp | 3179459 | 2477295 | x |
| **05SubsetSum** |  |  |  |
| /n00050/R01000/s055.kp | 12087 | 12087 | ✓ |
| /n00100/R01000/s055.kp | 24611 | 24611 | ✓ |
| /n00200/R01000/s055.kp | 50287 | 50287 | ✓ |
| /n00500/R01000/s033.kp | 123559 | 123559 | ✓ |
| /n01000/R10000/s006.kp | 2421639 | 2421639 | ✓ |
| /n02000/R10000/s012.kp | 4949949 | 4949949 | ✓ |
| /n05000/R10000/s017.kp | 12422197 | 12422197 | ✓ |
| /n10000/R01000/s053.kp | 2481670 | 2481670 | ✓ |
| **06UncorrelatedWithSimilarWeights** |  |  |  |
| /n00050/R10000/s033.kp | 17986 | 2401011 | ✓ |
| /n00100/R10000/s033.kp | 34555 | 4902246 | ✓ |
| /n00200/R01000/s006.kp | 77104 | 9904960 | ✓ |
| /n00500/R01000/s013.kp | 182925 | 24711920 | x |
| /n01000/R01000/s021.kp | 372392 | 49525290 | ✓ |
| /n02000/R01000/s032.kp | 747346 | 99049431 | x |
| /n05000/R10000/s033.kp | 1864185 | 247622510 | x |
| /n10000/R10000/s033.kp | 3721351 | 495247754 | x |
| **07SpannerUncorrelated** |  |  |  |
| /n00050/R10000/s022.kp | 132354 | 77314 | ✓ |
| /n00100/R01000/s017.kp | 24400 | 16138 | x |
| /n00200/R10000/s013.kp | 282842 | 350488 | x |
| /n00500/R10000/s011.kp | 868038 | 851220 | x |
| /n01000/R10000/s055.kp | 1448928 | 1126944 | x |
| /n02000/R01000/s000.kp | 459560 | 168004 | x |
| /n05000/R01000/s000.kp | 1131684 | 413019 | x |
| /n10000/R01000/s000.kp | 2283100 | 834925 | x |
| **08SpannerWeaklyCorrelated** |  |  |  |
| /n00050/R01000/s000.kp | 10354 | 11452 | ✓ |
| /n00100/R10000/s005.kp | 389766 | 166478 | x |
| /n00200/R10000/s011.kp | 715572 | 253737 | x |
| /n00500/R10000/s007.kp | 824454 | 287532 | x |
| /n01000/R01000/s047.kp | 177516 | 97248 | x |
| /n02000/R01000/s017.kp | 833689 | 323136 | x |
| /n05000/R01000/s017.kp | 2089817 | 809832 | x |
| /n10000/R01000/s017.kp | 4171773 | 1617006 | x |
| **09SpannerStronglyCorrelated** |  |  |  |
| /n00050/R01000/s008.kp | 20800 | 5700 | ✓ |
| /n00100/R01000/s003.kp | 50089 | 9989 | x |
| /n00200/R10000/s027.kp | 954264 | 354264 | x |
| /n00500/R01000/s015.kp | 273964 | 63764 | x |
| /n01000/R01000/s036.kp | 549879 | 164779 | x |
| /n02000/R10000/s046.kp | 10166440 | 3214440 | x |
| /n05000/R10000/s046.kp | 25365825 | 7974825 | x |
| /n10000/R10000/s046.kp | 50697277 | 15878277 | x |
| **10MultipleStronglyCorrelated** |  |  |  |
| /n00050/R10000/s000.kp | 217265 | 142265 | ü |
| /n00100/R01000/s000.kp | 43316 | 29016 | ü |
| /n00200/R01000/s005.kp | 84200 | 53100 | x |
| /n00500/R10000/s008.kp | 2043422 | 1282422 | x |
| /n01000/R01000/s028.kp | 403428 | 249228 | x |
| /n02000/R10000/s027.kp | 8123212 | 5053212 | x |
| /n05000/R10000/s027.kp | 20282796 | 12588796 | x |
| /n10000/R10000/s027.kp | 40373407 | 25001407 | x |
| **11ProfitCeiling** |  |  |  |
| /n00050/R10000/s003.kp | 132021 | 132031 | ü |
| /n00100/R10000/s004.kp | 238599 | 238613 | ü |
| /n00200/R01000/s028.kp | 45834 | 45854 | ü |
| /n00500/R10000/s048.kp | 1312527 | 1312573 | x |
| /n01000/R01000/s027.kp | 259026 | 259127 | x |
| /n02000/R01000/s051.kp | 498192 | 498374 | x |
| /n05000/R01000/s051.kp | 1250013 | 1250449 | x |
| /n10000/R01000/s051.kp | 2495064 | 2495937 | x |
| **12Circle** |  |  |  |
| /n00050/R01000/s005.kp | 268001 | 12719 | ✓ |
| /n00100/R10000/s000.kp | 19329757 | 289961 | ✓ |
| /n00200/R01000/s017.kp | 1075229 | 51029 | ✓ |
| /n00500/R01000/s001.kp | 2607828 | 123764 | x |
| /n01000/R01000/s019.kp | 5034768 | 238944 | x |
| /n02000/R01000/s034.kp | 10592765 | 502719 | x |
| /n05000/R01000/s034.kp | 25966424 | 1232334 | x |
| /n10000/R01000/s034.kp | 52080883 | 2471693 | x |

**Chú thích:**

✓: Có

x: Không thể kết luận

**Nhận xét (với các test case đã thứ nghiệm trong bảng):**

* Nhóm dễ nhất (cho lời giải tối ưu một cách nhanh chóng với tất cả test case):
  + 00Uncorrelated
  + 01WeaklyCorrelated
  + 05SubsetSum
* Nhóm khó nhất (chỉ cho lời giải tối ưu nhanh chóng của các test case với n = 50):
  + 07SpannerUncorrelated
  + 08SpannerWeaklyCorrelated
  + 09SpannerStronglyCorrelated