

INF01124 - Classificação e Pesquisa de Dados - Exercício 2

Felipe de Almeida Graeff
00261606

1 Quicksort

1. Após rodar o algoritmo implementado, foi constatado que existem 961 pares de chaves e cadeados, como pode ser conferido na saída do programa mostrada a seguir.

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961 key/padlock pairs were found.
02QbV, 09HeV, 0HCZq, 0R2Jq, 0SGAJ, 0TdFr, 0UrnP, 0VW15, 0VqfH, 0ZfeB, 0dJy7, 0ip9S, 0nnnA, 0s23c, 0t594, 0xalk, 13D12, 14AMH, 1BFgG, 1BW34, 1E00S, 1I2FH, 1Ie
Uq, 1Ig17, 1PmAr, 1M2ot, 1Z08D, 1cGBX, 1hChB, 1acVr, 1nhJE, 1sqRu, 1tJtd, 1uvnd, 1Z5p4, 1Z58C, 1Z5Yf, 1ZARs, 1ZD1E, 1ZGaW, 1ZG1K, 1ZIMd, 1ZhtR, 1ZJUR, 1ZV3U,
1ZVtG, 1Z1nA, 1ZM9w, 1Z0n2, 1Zj0g, 1ZaXw, 1K5QY, 1PMGd, 1Tqum, 1WdUr, 1Z1Xx, 1cp9W, 1H1Sb, 1UpmK, 1l0gJ, 1kz1n, 1771V, 14Brac, 14VWn, 1d0Qk, 1EGcy, 1T1nS, 1T
Wnz, 1YDhz, 1C1VS, 1dE04, 1oJmf, 1pwsx, 1yQ12, 1yKfY, 1S0ng, 1SAcp, 1SEpP, 1SErxf, 1SEt5, 1NGZU, 1S2B1, 1SK0B, 1VqkQ, 1SVkS, 1SmtY, 1SZvQ, 1SfzJ, 1M4Ap, 1SqHb5
, 1rTtm, 1SptP, 1Z5nP, 1G07W, 1G0Ld, 1G0tJ, 1GbnE, 1G0PQ, 1G5U6, 1GUXg, 1GWIx, 1GyUS, 1GZLB3, 1Gdf73, 1G1me, 1GubmE, 1Nu0D, 1T07L, 1VU0D, 17bBak, 1d1vG, 1eYzE, 1
NcBz, 1NkYb, 1TmLE, 1T1T7, 1Vx0L, 1Uk4d, 1ZcYr, 1B0G1, 1B0TL, 1B0PY, 1Bwyf, 1BPOJ, 1TKpD, 1W97n, 1V4wy, 1B0dR, 1BwGc, 1C31k, 1Fah1, 1Lm4d, 1Bn4T, 1pnic, 1BxM
0, 1BuGq4, 1vCHY, 14h9I, 1S1jX, 16P4D, 17J1A, 1CK0N, 19W2P, 1Jkng, 19Ycp, 19UVu, 19c0K, 19k0Z, 19gGx, 19D0D, 1AZeK, 1ASse1, 1A7GL, 1ACSh, 1AUBp, 1AUsR, 1AcuE1,
1Adob, 1Apal, 1AlGq, 1AS92, 1ASyG, 1AwUM, 1AyfX, 1B1Dz, 1B2Wz, 1BcBH, 1BNED, 1BN1X, 1BPCD, 1BqAJ, 1Bce4W, 1BkH1, 1B1MOL, 1Bq1J, 1Buvp, 1Bv9c5, 1BvRH, 1BweIn, 1CAP
6A, 1C5dV, 1Ch0e, 1CZB1, 1CmJc, 1CPTJ, 1C0tG, 1CRSD, 1Cf0Y, 1CZ0g, 1Cfaw, 1Cn1P, 1CvC1, 1D1Sb, 1D1AU, 1D1RZ, 1D11P, 1D2D3R, 1D3JZ, 1D4vz, 1DK6Z, 1DKWd, 1DPlm,
1DU1f, 1DV5M, 1DmW2, 1DVB8, 1D1XU, 1D1VP, 1Dm4U, 1ElfNC, 1E2WY, 1E0TER, 1EB0Kf, 1EBHJ5, 1Ed1qY, 1EELZr, 1EMJNP, 1ENbJ, 1ENL25, 1E0S5, 1ESZg, 1EVraE, 1EVUqR, 1E2Y2, 1E
wT0, 1EhDr, 1EkPf, 1E0Zr, 1ErYP, 1EsZrt, 1EdWA, 1F5H0R, 1F114, 1FLZ1Y, 1F0U5G, 1FVCB0, 1FdjW, 1Ffh1T, 1Fgr3U, 1FhT0, 1F3Rd, 1G39q, 1G5mJ2, 1G01n, 1GJAcX, 1G0eKJ, 1G58CJ
, 1GZB3, 1GfYy, 1GpMq, 1G3Vb, 1G0x1, 1G0PQ, 1GouP, 1GT0N, 1GmZD, 1G1G1, 1H01G, 1HFAp, 1Hc0U, 1HkZr, 1HhGf, 1H5F1, 1H4YyJ, 1HJg1, 1HYHq, 1KZVR, 1HjXN, 1H55Sh, 1H
q5FI, 1H0FF, 1H0XG, 1Hy6C, 1HqLH, 1IN1J, 1Qy3b, 1S5u0, 1WtXA, 1ZJXJ, 1fK65, 1JkRM, 1UfM0, 1JWQJ, 1J6B1, 1J6vCZ, 1J7Xp, 1J5VJ, 1JMPf, 1JmU1, 1JNkP, 1JmP, 1JmE1,
1JgaG, 1KCSJ, 1Jovx, 1JrgM, 1K2CT, 1K6wC, 1K75Ff, 1KcX4, 1KGD6H, 1K3BV, 1K13c, 1K1BF, 1K0eQ, 1KRA9G, 1KtQ15, 1KZRM, 1KcRQ, 1KbCQ, 1KegCb, 1KfX1, 1K9VH, 1KJ5ec,
1K0Wf, 1KZ6n, 1L3M4, 1LQ0P, 1L4Pq, 1LXCL, 1LEB2, 1P4FA, 1LQ9P, 1LX1J, 1L0Zf, 1L9FA, 1L6Zv, 1LE6C, 1UZnH, 1Z58P, 1MCL5, 1MERv, 1M0NB, 1KJ5Z, 1MgPZ, 1MmQD, 1L3
Gr, 1MrdY, 1Mmof, 1Mslr, 1MRKt, 1Mz57, 1N0U0S, 1N2Tne, 1N70X, 1N8TN, 1N9wS, 1NB17, 1NDKSD, 1NP3W, 1Nacq, 1Nb521, 1NHQ1n, 1Nj1A, 1N0dRf, 1Nr1va, 1Nu0U, 1D4cK, 1DwAX,
1OAEH, 1ODH5, 1OHyC, 1JR28, 1OLU1, 1O51H, 1OZQX, 1OB6B, 1eVNF, 1OgLOm, 1Of0C, 1OoHG, 1Of09, 1OuAY, 1OvXP, 1O1q1, 1P3Gt, 1PcDc, 1P6xro, 1P85g, 1PMPc0, 1P1C8, 1P
Xvz, 1Pwde, 1P0Kv, 1Pede1, 1Pqk4, 1P1KP, 1P1Lk, 1P1G2, 1Q1MZ, 1Q69F, 1Q8Cd, 1QXcb, 1Qm0d, 1QVH, 1Q1mQ, 1Qm95, 1Q6nE, 1Q4dQ, 1Qmrd, 1QaxJ, 1Q14G, 1Q71G, 1Q705
, 1Q31Y, 1QK1B, 1Qb5Y, 1Q08T, 1QeE1, 1Q7fJ, 1Q257, 1R0EM, 1R8TF, 1R1Z1, 1RLHq, 1RVZC, 1RmG1, 1R2EM, 1Rc9J, 1Rf3K, 1R1W, 1RyZX, 1R0T0, 1R1AT, 1RUB0, 1RVH5, 1R
wJc, 1RYKfZ, 1RyQD, 1RzWd, 1S2P1, 1S2rT, 1S5qRj, 1S7qXp, 1SCK8X, 1S3fX1, 1SLw4, 1SMY0, 1STL10, 1SuetK, 1SXf1f, 1SYJq1, 1SZVRj, 1SaFeb, 1Sds6H, 1Se1G5, 1SK4M, 1S5TN9, 1SYa
E, 1SZ4F, 1T0U, 1T1up, 1T85V, 1Dab, 1T0XG, 1T083, 1TMB8, 1TfTj, 1Tux1, 1Z1JU, 1D0Z5, 1T11h, 1KzBM, 1T0UF, 1T010, 1TmU7, 1U91W, 1UACce, 1UBCQ, 1UCL0,
1UGRH, 1UKB15, 1Uwck, 1UB17, 1UyEY, 1UCZF, 1U01W, 1U4Zz, 1U24Z, 1UwM1, 1Y8D0, 1V10W, 1V1Ct, 1V0M1, 1V0KE, 1V51J, 1V0Y2, 1V1Rz, 1V0mE, 1W5AB, 1W6PE, 1W5U4, 1WCC
20, 1WtVC, 1WdCJ, 1Wb6E, 1WENK, 1Wg1K, 1Wsp1, 1I03W, 1XfKc, 1X0L7, 1X58B, 1XZ0J, 1XcCX1, 1XcXDL, 1Xm07, 1Xq3H, 1XudKv, 1XuyP, 1Y4E4, 1Y6P21, 1YB4d, 1YHnZ, 1YHUK,
1YMap4, 1YMEH, 1Y0T8, 1YTeJ, 1YFM, 1YX1J, 1YmD, 1Y0PK, 1YhGc, 1Yk09, 1YyJc, 1YmVf, 1YcQ4, 1Yq1Q, 1Z2Xt, 1Z2Y7V, 1Z4nH, 1Z5XB, 1Z9H9, 1Z0FZ, 1Z50S, 1Zv18, 1Z
e5f, 1Z0Yy, 1Z0rJ, 1Z0Bn, 1ZU1A, 1e0SH, 107Kd, 1eT12, 100DY, 100SE, 101EU, 10PKo, 10HMG, 1c7R0, 10L5T, 10gY1, 10k1Y, 10XV0, 10b25, 10aXG, 10pAP, 10aUd, 10WFG
, 10pHD, 1b3YJ, 1b5Gy, 1b8Xo, 1b9CU, 1b4fC, 1bD9F, 1bD3L, 1bD0D, 1b1E0, 1bSLHG, 1bT4K, 1bUXk, 1bYc4, 1bcs0L, 1b18CE, 1bqBHA, 1bSZMP, 1bupm, 1bPMT, 1bWbB, 1c5G7, 1c
36ac, 1c40Y, 1c3pG, 1c5CUs, 1cVf7, 1c9Y0, 1cBWA, 1cBV1, 1cJErX, 1cP1M, 1c0HJ, 1cVBG, 1cUzU, 1cZk1, 1c55H, 1cF0Yf, 1cQ1A, 1cPcE, 1cHmV, 1cKTD, 1cPcU, 1cRt1, 1cUKV
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1dwbz, 1e13F, 1eH5A, 1JES1, 1ekB1, 1emBd, 1eNTJ, 1ePH4f, 1eTuf, 1eXrf, 1ebHd, 1ed8CJ, 1edcR, 1e1n5, 1eKEXM, 1en9W, 1en9Y, 1epHF, 1eqQb, 1ezJa, 1f0F0, 1f7Ar, 1f9E
Vv, 1f9v9, 1f1Dp, 1f8Zp, 1fBnt, 1fEJ7, 1fFuR, 1fG0B, 1fG1L, 1fM4B, 1f01Se, 1fQcZ, 1fDzeF, 1fBka, 1fM5H, 1f0yY, 1fj3k, 1f41d, 1fWZP, 1fXbJ, 1g2U0, 1g3TH, 1g5XUz,
1gBmz, 1gCZ3, 1f14F, 1g03b, 1gJ1E, 1g50Y, 1gV1A, 1g1hP, 1gYfY, 1gZdW, 1gcmY, 1g4pU, 1g11b, 1g1YH, 1gBbA, 1gD6E, 1g5d0, 1gUad, 1gczb, 1h4Rf, 1h6VJ, 1h4Eg, 1h
T0B, 1hF1N, 1hKZC, 1h02n, 1h5Gk, 1hZVC, 1hCLV, 1hL1D, 1herJ, 1h02a, 1h2SG, 1hJkR, 1hmqf, 1hW10, 1hXfZ, 1L5YH, 1l8Vat, 1ETHJ, 1IKWQ, 1S9Yx, 1bCK4, 1be97, 1bt5f
, 1i9NC, 1i9qZ, 1yqaz, 1j4CU, 1j5vnd, 1j50W, 1jLC8, 1j1qZ, 1jWJ3, 1jYVU, 1jH1Z, 1jnj9p, 1k11N, 1k40Z, 1k7Mc, 1k1Nan, 1kKwZ, 1kZuk, 1K9eF, 1Ky1G, 1kCMAZ, 1kccY, 1k
p4J, 1k1Zr, 1kq54, 1KyG5, 1KyGZ, 1kZBM, 1L4V0, 1G83J, 1JFZ, 1UAXx, 1S5pJ, 1M4p, 1LbW, 1L1G, 1J0AT, 1003J, 1qWq, 1L4T, 1Ld1M, 1Lz25, 14SHH, 1m0Sx, 1S1F
J, 1m1eP, 1m0HT, 1m4DU, 1mC49, 1mYU3, 1mXxJ, 1mJ02, 1m3PY, 1mL71, 1m0RW, 1mQz6, 1m0WT, 1mV1B, 1mMGc, 1mMk1, 1mZ1K, 1mCFH, 1mPEA, 1mQ1B, 1m4PUR, 1m5Yf, 1m5Yt,
1m10H, 1n4DE, 1nD7Z, 1nF2D, 1nG1F, 1n50X2, 1nKq9, 1nX3Aw, 1nY1X, 1nYXW, 1nW4, 1nTNN, 1nF0g, 1nYcf, 1ngC4, 1nj9B, 1n0Ue, 1nzpD, 17MMQ, 10B8U, 10AZ1, 10ETJ, 10Fe
53, 10L1U, 10tWc, 12ZqP, 10m0W, 104EZ, 113B, 10L1N, 10095, 1008C, 1P7m, 11C1U, 1K07X, 1K1G1, 1G5mZ, 1G7YH, 1C0W, 1P1VY, 1PnHb, 1P1VK, 1P1VZ, 1P1S1, 1Q0S0,
1Q41D, 1Q71G, 1QTPK, 1Q1G2, 1QmV5, 175UE, 1R4WZ, 1R94C, 1X14V, 1Jw1, 1Rr0D, 1WmCJ, 1RyOT, 13F11, 1S9QD, 1CKHP, 1Cm71, 1DTRU, 1SWMB, 1S5qZ2, 1US8F, 1c1f, 1c
x7f, 1gZtp, 1hmlJ, 1j00H, 1x9pU, 14NGG, 181M, 19f3b, 10M4, 1Mw5, 1WJub, 1bUrz, 1cSCH, 1cFK1, 1fWtB, 1m3n1, 1xsaT, 1y1Q, 1u9pY, 1uZV3, 1u5e4, 1u5Z1, 1u1SW,
1u1B9, 1u2J1, 1u007, 1u0Jc, 1u1K5, 1u1Yy, 1u0Mf, 1u1M5, 1u2JL, 1u4Ne, 1u2Re, 1u0M1, 1u0Bb, 1u0C3, 1u0Pv, 1u0Re, 1V1J5, 1Z0Re, 1u1K4, 1v1e4Z, 1v1Mg, 1
vCKN, 1v9qU, 1v41G, 1vDx1, 1vX1H, 1w2R5, 1w501, 1wZ7f, 1w47R, 1wC1G, 1wD1X, 1wPwW, 1wDh0, 1wDn1, 1wX4N, 1wYD1, 1wC5d, 1wQDc, 1wM1, 1wK1R, 1wYf, 1wX1G, 1w509
V, 1wU07, 1wU05, 1wY0B, 1wYq7, 1X1P9, 1X7P2, 1XBrK, 1X51B, 1X7K0, 1XWc1, 1XBRc, 1XU5D, 1XkYJ, 1YH0L, 1Y6MP, 1Y75Me, 1YH14, 1Y0vF, 1Y7B5, 1YrY7, 1YXZ0, 1YcM5,
1YcXZ, 1YXVH, 1YnYB, 1Y5G, 1Z0Z3, 1ZCHr, 1Z0E1, 1ZEn1A, 1ZfZw, 1ZHTV, 1ZUPe, 1ZUqV, 1ZVZr, 1ZH5, 1ZVGU, 1ZQUd, 1Zd5a, 1Zy0N, 1ZV9P,
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2. A seguintes tabelas contém as estatísticas pedidas.

Lista de chaves

Total de <i>swaps</i>	5146
Total de chamadas recursivas	1307
Maior razão de particionamento	979
Menor razão de particionamento	1
Razão de particionamento média	16.4273

Lista de cadeados

Total de <i>swaps</i>	5929
Total de chamadas recursivas	1293
Maior razão de particionamento	979
Menor razão de particionamento	1
Razão de particionamento média	16.2368

3. Comparação de tempo de execução utilizando particionamento constante e particionamento aleatório.

	Lista de chaves	Lista de cadeados
Quicksort padrão	0.000841s	0.000823s
Quicksort aleatório	0.000874s	0.000896s