

Advanced practical Programming for Scientists

Thorsten Koch

Zuse Institute Berlin

TU Berlin

WS2014/15

bip_2NrNnC.dat	28 rows, 26 cols, Checked	67108864 vectors in	1.346 s = 49875.561 kvecs/s,	Found 191100 feasible solutions
bip_3E1gN5.dat	3 rows, 8 cols, Checked	256 vectors in	0.000 s = 42666.667 kvecs/s,	Found 168 feasible solutions
bip_6csCZ3.dat	10 rows, 19 cols, Checked	524288 vectors in	0.011 s = 46270.232 kvecs/s,	Found 165186 feasible solutions
bip_8hG0TA.dat	3 rows, 4 cols, Checked	16 vectors in	0.000 s = 16000.000 kvecs/s,	Found 8 feasible solutions
bip_8kOEMA.dat	2 rows, 4 cols, Checked	16 vectors in	0.000 s = 16000.000 kvecs/s,	Found 4 feasible solutions
bip_AYrhE1.dat	12 rows, 28 cols, Checked	268435456 vectors in	3.047 s = 88103.368 kvecs/s,	Found 123591 feasible solutions
bip_BnF8SS.dat	11 rows, 21 cols, Checked	2097152 vectors in	0.045 s = 46940.305 kvecs/s,	Found 504504 feasible solutions
bip_EETzvD.dat	18 rows, 26 cols, Checked	67108864 vectors in	1.627 s = 41253.463 kvecs/s,	Found 10688832 feasible solutions
bip_FNUjEn.dat	18 rows, 26 cols, Checked	67108864 vectors in	1.631 s = 41139.735 kvecs/s,	Found 10688832 feasible solutions
bip_GapHIm.dat	22 rows, 26 cols, Checked	67108864 vectors in	1.964 s = 34170.614 kvecs/s,	Found 7459512 feasible solutions
bip_KC9M3M.dat	68 rows, 29 cols, Checked	536870912 vectors in	19.631 s = 27348.265 kvecs/s,	Found 165120 feasible solutions
bip_LqPgLR.dat	10 rows, 17 cols, Checked	131072 vectors in	0.003 s = 43676.108 kvecs/s,	Found 40866 feasible solutions
bip_McODgq.dat	25 rows, 21 cols, Checked	2097152 vectors in	0.049 s = 43060.901 kvecs/s,	Found 21204 feasible solutions
bip_O0VIFy.dat	8 rows, 20 cols, Checked	1048576 vectors in	0.019 s = 54853.317 kvecs/s,	Found 364952 feasible solutions
bip_QlwKMs.dat	15 rows, 23 cols, Checked	8388608 vectors in	0.202 s = 41523.240 kvecs/s,	Found 1564038 feasible solutions
bip_Qxm7X1.dat	4 rows, 6 cols, Checked	64 vectors in	0.000 s = 32000.000 kvecs/s,	Found 14 feasible solutions
bip_RScS67.dat	21 rows, 24 cols, Checked	16777216 vectors in	0.368 s = 45630.187 kvecs/s,	Found 412272 feasible solutions
bip_VEqjNW.dat	29 rows, 29 cols, Checked	536870912 vectors in	10.417 s = 51538.884 kvecs/s,	Found 832320 feasible solutions
bip_WT6l8I.dat	11 rows, 24 cols, Checked	16777216 vectors in	0.357 s = 46976.318 kvecs/s,	Found 4309375 feasible solutions
bip_ZZvPie.dat	3 rows, 8 cols, Checked	256 vectors in	0.000 s = 51200.000 kvecs/s,	Found 175 feasible solutions
bip_axUddE.dat	22 rows, 26 cols, Checked	67108864 vectors in	1.970 s = 34056.804 kvecs/s,	Found 7459512 feasible solutions
bip_cXuJoD.dat	25 rows, 17 cols, Checked	131072 vectors in	0.002 s = 53173.225 kvecs/s,	Found 520 feasible solutions
bip_de6XFz.dat	15 rows, 24 cols, Checked	16777216 vectors in	0.400 s = 41993.853 kvecs/s,	Found 2419020 feasible solutions
bip_f4vmB0.dat	44 rows, 21 cols, Checked	2097152 vectors in	0.064 s = 32894.438 kvecs/s,	Found 1152 feasible solutions
bip_gHILD5.dat	20 rows, 17 cols, Checked	131072 vectors in	0.002 s = 64314.033 kvecs/s,	Found 668 feasible solutions
bip_hHakza.dat	3 rows, 8 cols, Checked	256 vectors in	0.000 s = 42666.667 kvecs/s,	Found 168 feasible solutions
bip_iNRRAG.dat	11 rows, 24 cols, Checked	16777216 vectors in	0.354 s = 47390.588 kvecs/s,	Found 4309375 feasible solutions
bip_jCG8RM.dat	11 rows, 21 cols, Checked	2097152 vectors in	0.046 s = 45457.840 kvecs/s,	Found 504504 feasible solutions
bip_jMcBE2.dat	68 rows, 27 cols, Checked	134217728 vectors in	4.972 s = 26994.200 kvecs/s,	Found 125235 feasible solutions
bip_l9Uziw.dat	15 rows, 23 cols, Checked	8388608 vectors in	0.199 s = 42098.806 kvecs/s,	Found 1564038 feasible solutions
bip_qbEwMP.dat	8 rows, 7 cols, Checked	128 vectors in	0.000 s = 42666.667 kvecs/s,	Found 12 feasible solutions
bip_sTsPro.dat	37 rows, 17 cols, Checked	131072 vectors in	0.003 s = 47148.201 kvecs/s,	Found 0 feasible solutions
bip_vFWyWT.dat	8 rows, 20 cols, Checked	1048576 vectors in	0.020 s = 51794.320 kvecs/s,	Found 364952 feasible solutions
bip_wBDewS.dat	15 rows, 24 cols, Checked	16777216 vectors in	0.395 s = 42483.967 kvecs/s,	Found 2419020 feasible solutions

bip_2NrNnC.dat 28 rows, 26 cols, 191100 solus

gcc -O3 -march=native

ex6 1.346 s = 49875.561 kvecs/s

ex5 123.934 s = 541.487 kvecs/s

ex5 23.024 s = 2914.777 kvecs/s -DNDEBUG

- Find out how `n` & `negn` works

- Find out how

```

    if (updatemask & 0xffff0000)
        colidx += 16;
    if (updatemask & 0xff00ff00)
        colidx += 8;
    if (updatemask & 0xf0f0f0f0)
        colidx += 4;
    if (updatemask & 0xcccccccc)
        colidx += 2;
    if (updatemask & 0xaaaaaaaa)
        colidx += 1;

```

works

- Read about De Bruijn sequences and Gray codes
- Find out how to enumerate subset sum and knapsack problems.
- Finish the code.